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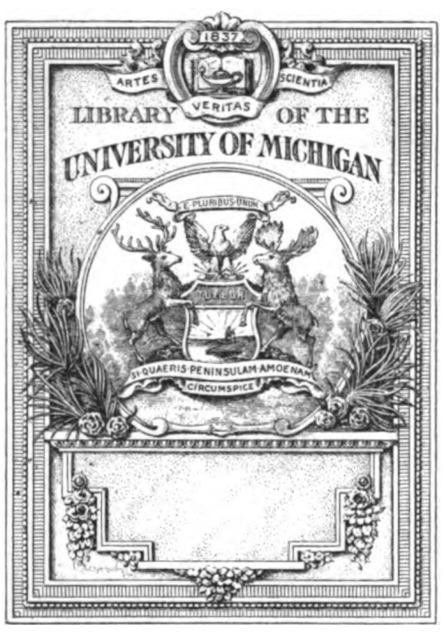

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The Builder

AN

ILLUSTRATED WEEKLY MAGAZINE

FOR THE

ARCHITECT, ENGINEER, ARCHÆOLOGIST, CONSTRUCTOR, SANITARY REFORMER, AND ART-LOVER.

CONDUCTED BY

GEORGE GODWIN, F.R.S., F.S.A.

"Every man's proper mansion-house, and home, being the theater of his hospitality, the seate of selfe-fruition, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kinde of private princedome, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned."

"Architecture can want no commendation, where there are noble men, or noble mindes."—Sir Henry Wotton.

"Our English word To Build is the Anglo-Saxon Byldan, to confirm, to establish, to make firm and sure and fast, to consolidate, to strengthen; and is applicable to all other things as well as to dwelling-places."—Diversions of Purley.

"Art shows us man as he can by no other means be made known. Art gives us 'nobler loves and nobler cares,'—furnishing objects by the contemplation of which we are taught and exalted,—and so are ultimately led to seek beauty in its highest form, which is Goodness."

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Our Waterside Towns, and the Present Gravitation of the Building Trade towards them.

THE remark that all great cities are situated on the banks of great rivers is one that must be accepted with some reserve. London, no doubt, is the child and the nurseling of the Thames. But Rome is not the child of the Tiber, nor is Paris that of the Seine. The existence of a copious and perennial supply of water is, indeed, a necessary condition of the growth of a great town. But it is not always by a river that the requisite supply is best afforded. And in early times, at least in many parts of the world, the spots selected, first for the eyries of the little robber chieftains, and then for the sites of the towns that grew up under the shadow and protection of these strongholds, were rather mountain tops than river estuaries. Throughout Italy, and in many parts of France and Germany, this is notably the case. And in Palestine, where history goes as far back towards the past as in almost any part of the world, the struggle for the capital rank was long kept up between the arid but highly defensible rock of Jerusalem, and the naturally commanding and equally riverless elevation of Samaria or Shechem. The maritime importance of Tyre and of Sidon, like that, in later times, of Venice and Amalfi, was by no means connected with a local supremacy over the interior of the country.

Our present object in referring to this matter is to call attention to the change in the gravitation of population towards urban centres, of which certain indications are now visible. To the architect, the builder, the owner of, or speculator in, house property of any kind,—the moment he looks beyond the prices or the wants of the hour,—the subject is one of primary importance. Great fortunes are most readily won or lost, in any matters connected with building, by the exercise of the faculty of prevision, or at least of that sound induction from known facts which tends to show in what direction the movement of the future may be anticipated. As to this, a cause of change which came into operation some half a century ago, although still powerful, is no longer alone in its efficiency. Other causes are beginning to act as factors,—some naturally, some disastrously. It is for the statesman, or the public counsellor, to look these elements of change in the face.

In the first place, the observer has to inquire into the change which is taking place, not in England alone, or in Europe alone, but pretty well all over the world, in the distribution of urban and rural population. We took occasion the other day (vol. xlii., p. 727) to point out that the increase in the building going on in the metropolis, and in towns of more than 3,000 inhabitants, was exactly double that going on at the same time over all the rest of the country. In France the disturbing element is far more active than in England; but this is, unfortunately, only matter of degree. The first June number of the *Revue des Deux Mondes* contains a very significant and sombre article on the decrease of the population in France. It is in certain provinces, specified by the writer, that the most alarming and rapid decrease takes place. But, on the whole, the population of France is on the ebb, amid the full tide of surrounding Europe. And if the evils pointed out by the writer cited spread in their contagion, the national decline of that country is a certain feature of the not remote future.

The special cause active in France,—the positive refusal of a considerable portion of the population to rear families,—is not, as yet, thought to be prevalent among ourselves. Yet it is impossible to avoid hinting that the main though unspoken cause of certain personal or party squabbles that have of late disgraced our civilisation has been the strong repulsion felt by Englishmen of nearly all shades of opinion to the attempt to found in this country a sort of *propaganda* of national decay. Even as it is, while our rate of interest during the last decade was higher than it has been in any decade since 1831—41, there was actual decline of the population in no fewer than fourteen counties. While the balance of increase was 14·34 per cent. on the number of 1871, there was a decrease of from 0·05 to 9·1 per cent. in the counties in question, the most considerable decline occurring in Cornwall. But we should not confine our purview to England alone, in face of the fact that, since 1846, the population of Ireland has decreased by no less than 40 per cent.

What is common to England and France, and no doubt exists elsewhere, is this. The rural population are attracted towards the towns, and the proper balance between births and deaths is thus altered, partly by the less viable conditions of town life for infants, and partly by other assignable causes. This movement we can do little more than mark. But the change to which we refer is this. The town agglomeration of the last three or four decades has been chiefly aided and stimulated by the facilities of railway communication. We have some very remarkable figures before us which show that this element of change, which is still powerful in agglomerating buildings around stations, instead of spreading them along inland highways, is in some marked cases far less efficient than are the increased facilities for maritime communication which have been won by the enterprise of such towns as Newcastle, Stockton, and Glasgow.

In the middle of the last century the Clyde was fordable on foot at Dumbrick Ford, twelve miles seaward of Glasgow. In the year 1773, the improvement of the river was commenced by Mr. Golborne, and within eight or ten years, partly by dredging, and partly in consequence of the improved scour of the river, the channel was lowered 14 ft. at this spot. In the beginning of the present century the work of improvement was carried on by Mr. Rennie; and in 1840, a digested scheme of improvement laid down by Mr. James Walker, was taken in hand. Between 1844 and 1871, about 14,000,000

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cubic yards were dredged from the river. Thus, while in 1755 the depth of the Clyde at Glasgow was only 1 ft. 6 in. at low water, in 1830, vessels drawing 15 ft. of water, and in 1870 vessels drawing 22 ft., were able to use the harbour. And now the available channel is 24 ft. deep at high water, from Glasgow to Port Glasgow, and vessels drawing 22 ft. of water can reach the sea from the former city in a single tide.

Directly connected with this opening of the maritime channel has been the increase of Glasgow. In 1801, the population was 77,385. In 1841, when Mr. Walker was attacking the question of water access, it had risen to 255,650, or rather more than trebled. In 1881, including the population of the suburban burghs, it was 668,859, or between ninefold and tenfold of its size in 1801. In the last twenty years the shipbuilding on the Clyde has increased from 66,801 tons to 341,022 tons, or more than fivefold.

Similar effects have been produced, by like means, on the Tyne. The improvement of this river was commenced in 1843, but by 1860 the depth over the bar was only 6 ft. at low-water spring tides, and the depth of water at flood tide at the Redheugh Bridge was only 12 ft. below the high-water level of 1875. It is now 34 ft. at that spot below that level. During the same period the tonnage clearing from the Tyne ports has grown from 3,196,781 tons in 1861 to 5,908,886 tons in 1881; and the population of the Tyne ports from 227,926 in the former year to 500,000 in the latter.

The significance of these figures is enhanced by comparing them, not only with the decrease of the population in Cornwall, or with the mean increase of 14·54 per cent. in ten years in England and Wales, but with the steady normal increase of London and Liverpool. The latter port has now very close upon one-third of the entire sea-borne commerce of the kingdom. From 1861 to 1881 its shipping has increased 59 per cent. During the same period that of the Tyne has increased 85 per cent., and that of the Clyde 103 per cent. Thus, when the engineer has waited upon nature, and has, with her powerful aid, opened a channel for sea-borne traffic to inland towns, the builder has followed in his wake; and while London has demanded housing for double her population in forty years, Glasgow has made a like demand in thirty, and the Tyne ports have done the same in less than twenty years. So important a change in the distribution of our internal growth is a fact of extraordinary significance.

It will be understood by our readers that we are approaching this many-sided question from the point of view of its architectural significance. Not, that is to say, of pictorial or structural architecture, although that is a matter on which there is perhaps much to be said,—but with regard to the prospects and the activity of the builder. Nor is it house-building alone that is in question. Churches, markets, town-halls, and other important buildings are demanded by the increase, and grow with the growth of population; and that with greater rapidity, as well as in more stately proportions, than at any previous time in our own national history.

While, then, the contrast between inland and seaboard or riverain building may be considered as originally a question of race, it is certain that since races have become blended, as they now are in this country, there has been a sort of oscillation between the two tendencies. In those remote times, as to which we have not a single word of written history, although we have monuments in great numbers, it is pretty clear that the capital of great part, and probably of the whole, of the island was in the elevated site of Avebury. The numbers of barrows that surround a spot of such extraordinary former grandeur testifies to this, no less than do the actual relics. It might, perhaps, be urged that this concourse of the departed only indicated a religious, and not a political centre. But the reply to this is, that the distinction is a mark of comparatively recent times. When we obtain the first written account of our country, from the pen of Julius Cæsar, it is tolerably certain that no inland mountain capital existed. Neither the Roman nor the Norman conquest would have been possible if Avebury had been at the date of either of those invasions a strongly-fortified capital. On the contrary, it was, as late as the time of Alfred, to the swamps and to the marshes that our ancestors betook themselves for shelter from the foe; and the Swiss lake dwellings may probably give us an idea of the architecture of Britain in the first century. We are not unaware of the claim put forward for Verulam as the capital in the time of Cæsar, but we incline to the view which points even then to the primacy of London.

We need not trace the alternate importance of seaport and of inland towns during the changes of our early history, or recall the past importance of the Cinque ports, afterwards increased to eight. Generally speaking, as maritime adventure and prowess predominated, the ports rose in comparative importance; as travelling was made more easy and roads improved, the inland towns increased. London shared in the advance of each. But it was the opening of the cheap and easily route of the canals that opened our collieries, and enabled the steam engine to create those hives of internal industry which abound in the Black Country and other mining and manufacturing districts.

The reduction of the cost of land carriage to one-fifth of the former cost by road, which we owe to George Stephenson and his school, gave again an impulse to the growth of our inland centres. But as this mode of conveyance spread over Europe, and as foreign manufactures, produced by English machinery,—more and more competed with English manufactures in the markets of the world,—the fact that every form of land carriage must of necessity be more costly than water carriage has become more and more apparent. And at the moment at which we write it is this force which is causing such a movement as we have before mentioned to the free water sides of the Clyde, the Tyne, the Tees, and other rivers and estuaries. It is not the sea-port, alone, or the neighbourhood of mines or collieries, alone, that now determines the site selected for a great and lucrative industry. What manufacturers are now observing is this. They must have at the same time water access to the sea, and water access to mines and to collieries. The more near the centre of a great consuming district these two conditions can be secured, the more certain is the future growth of the population. But the feature which, so far as we can foresee, will distinguish the building energy of the next twenty or forty years from that of the past half century is the fact that water access to the sea is likely to prove more attractive than proximity to mines. An instance of what we mean is found in the fact that the directors of the great limited Company of Charles Cammel & Co. have reported that the rail-mills must be alongside the blast furnaces, and that these must be close to the place where the ore is found, and must also be accessible by sea. They are for this reason removing their works from Sheffield, the cradle of the steel manufacture, to Cumberland. It is hardly to be doubted that this great blow to the prosperity of Sheffield is not unconnected with the purchase of the Dove river navigation, of the Sheffield Canal, of the Dearne and Dove Canal, and of the Stainforth and Keadley Canal, by the Manchester, Sheffield, and Lincolnshire Railway Company. The direct waterway from Sheffield to Goole is only thirty-five miles. The cost of carriage, if unimpeded, would be not more than a shilling a ton for the entire distance. Wherever the new works are situated, there must be some cost incurred,—and it is hardly to be thought credible that a great manufacture would leave its cradle if all that it could expect to gain by so doing would be the fraction of a shilling per ton on its transports. At all events, it is extraordinary that, at a time when steel is becoming more and more exclusively a building material, not only for naval architecture, but for military defence, Sheffield should lose its ancient predominance in the manufacture.

It may be said that the activity of the builder will be as lucrative on the new site of every such displaced industry as in the old. Nay, even more so; for the workmen, who are already housed in Sheffield, will require new dwellings on the new site. But a brief stimulus of this nature given to the activity of the builder is not without its counterpoise. How about the empty houses at Sheffield? How about the increased incidence of the local rates on those left behind? What is of even more importance than foresight as to the movement of the centres of industry, is the need that such movements should not be produced by artificial causes. We fear that it is so in this case; and, if so, whatever be the gain to individuals, the balance is loss to t[illegible]ry.

SEPULCHRAL AND MEMORIAL ARCHITECTURE.*

THE transition from the Pagan to the Christian tomb seems to be as gradual, as deficient in marked character or decisive alteration of type, as the transition from Pagan to Christian style in architecture considered at large. In a certain sense, the passage from the one to the other might be said to be found in the Catacombs, but, in fact, these rather serve to show how impossible it is to draw the line, save in one point only; the Christians did not burn their dead, and did not, therefore, make use of cinerary urns. The urn is a purely Pagan attribute, so distinctly so as to render almost absurd the prominence given to it as a feature in Christian monuments during a great portion of the period since the Renaissance. But the Roman arrangement of cinerary urns in *columbaria*, or ranges of niches, seems to have given the hint for an arrangement which was destined to be continued in a modified form up to the end of the Mediæval period. The placing of the coffin or sarcophagus in a niche in the wall, there can be little doubt, was derived from the columbarium; the sarcophagi of Roman families had been, in fact, so placed before the Christian era, but often with the ends turned towards the opening, of course a manner of arranging them which was much more economical of space than the longitudinal position. For whatever reason, however, the longitudinal position of the sarcophagus was definitely adopted by Christians at an early period; and it is in this form that Christian tombs and monuments appear in the Early Mediæval period, after an interval during which Pagan architecture had gradually deceased and Christian architecture not yet fairly entered on its course of new development. Of course, as far as architecture at large was concerned, there never was any real gap in the series of buildings from Roman to Mediæval; but in regard to tombs there seems to have been a positive hiatus, for some time previously to the twelfth century, during which the treatment of tombs as opportunities for expressive and decorative architectural design was almost entirely in abeyance.

There is, however, another development of tumular architecture on a larger scale, from Roman into Christian, of which there are but few though important examples, and which could not possibly be omitted in our glance at the subject. The examples of this are in the circular or octagonal tomb-churches, as they may be called, which formed the repetition of the idea set forth in such an erection as the mole of Hadrian. In these, again, we have the repetition of the Roman form of building merging, by gradual and almost imperceptible stages, into a form essentially Christian, but which was practically abandoned at an early stage of Mediæval history. The earliest link in the series was the tomb of St. Helena, almost entirely Roman in style, a circular building in two stages; another form is the tomb of Theodoric at Ravenna, octagonal instead of circular, but in other respects preserving the Roman two-story form even more completely than the tomb of St. Helena, inasmuch as the upper story is of smaller dimensions than the lower, appearing to grow out of it, as must unquestionably have been the case also with the mole of Hadrian before the colonnade was removed from the exterior of the lower stage of the building. The church at Aix-la-Chapelle, first built as a circular church with no choir, by Charlemagne, and probably intended to serve the purpose of a grand tomb on somewhat the same model as that of Hadrian, is the last of this class of building in the progress of European architecture, unless we were to include the circular churches of the Templars, which are so far connected with the subject that they are copied from a tomb-building, though not built with any idea of their fulfilling the same function, save in the same degree in which nearly all Mediæval churches may be said to do so, as being the receptacles of monuments of the dead. The octagon or dome form of tomb, however, received even higher development than it had ever received from the Roman or Romanesque builders, at the hands of the Saracenic architects in India, whose peculiar form of tomb design, the octagon dome rising from an arcade on the ground story, is probably to be traced to Rome also, though through what intermediate

* See vol. xlii., p. 759.

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stages it is not easy now to say, when so much of the probable connecting chapters of the history have been expunged. The comparison of the Taj Mehal with the mole of Hadrian is, however, very significant and striking, not only architecturally, but in regard to the sentiment expressed in each of these great and world-famous monuments. The Hadrian building was the expression of no tender memory of the dead; it was the expression of mere personal pride and ambition, the resolve of an irresponsible ruler to provide a great monument to testify to his own wealth and power. The Taj expressed a far higher feeling; it was the consecration of the memory of one who was beloved, the desire to do honour to her memory, not to that of the builder of the monument himself. And though in any case the one would have been in Roman, the other in Saracenic style, there does seem to be about the Indian monument a poetry and tenderness of feeling, an endeavour to convey the idea of hallowed and beautiful repose, which is certainly widely different from the cold pomp of the structure reared by the Roman Emperor, if we can imagine it as it was in its entirety without its Mediæval additions. In one respect there is, however, something in common between the circumstances of these two erections; both were the work of despots, done for their own pleasure only, though in a somewhat different sense; both represented a magnitude and costliness of structure which can only be applied to tomb-building when economical considerations can be set aside, at the will of a despotic power. In this respect the Mole and Taj represent the same thing socially as the pyramids represented,—the domination of a favoured caste. The only other condition under which such expenditure can be gone to in the building of tombs or monuments is when the popular will combines in favour of a sumptuous monument to one who has deserved well of his country; otherwise, immense and costly tombs and monuments are generally symbols of despotism.

The earliest form of Mediæval monument on a smaller scale is one which presents a very interesting union of Roman and Gothic feeling. It is shown in the form of a sarcophagus placed in a niche,—a sarcophagus manifestly derived from Classic forms, but partly fenced in and defended by a light Gothic arcade. Instances of this stamp of Gothic monument occur in France in the twelfth century, at which period it seems probable that the sarcophagus was, in fact, the coffin, and contained the body, though it was not long after this that the actual practical use of the sarcophagus was abandoned, and the form alone for a time retained, the actual receptacle of the remains being beneath it, as is generally the case where the sarcophagus form is used in modern cemeteries. The arcade in some cases did not form an actual screen in front of the sarcophagus, but was based upon it, a shaft, or more than one, springing from the apparent lid of the sarcophagus. Nothing could well be more pleasing and picturesque in effect than the niche tomb with the arcade in front of it, and it seems surprising that this feature of the arcade was abandoned at so early a period as it was, while the niche or arched opening in the wall for the reception of the sarcophagus was retained up to a late date of Gothic architecture. In England this picturesque idea of the niche or wall arch, with the arcade in front of it, did not come into use at all, as far as we remember. The earliest form of monument or tomb known in English Gothic architecture, was the simple sarcophagus with the top falling either way like the section of a roof, and with a cross worked on it. There are occasional instances of more elaborate work, as in a well-known instance at Lewes; but they are exceptional in work of early date. Afterwards this sarcophagus was placed in a wall arch, though without the arcade in front, but in both English and French tombs it was not long after the middle of the twelfth century that the practice was adopted generally of placing on the sarcophagus the image of the deceased. The practice of doing this was by no means unknown in Roman, and even in Etruscan tombs; but in these the figure was always represented in a sitting posture (see the well-known and remarkable Etruscan monument in the British Museum); while in the Mediæval period, the tomb-figures are always represented recumbent and generally as if to convey the idea of sleep. If the intention really was to convey this latter idea, it must, of course, have had reference to the Christian idea of death as merely a sleep, awaiting resurrection. It does not seem, however, by any means, certain that this was the intention, or that more was intended in many cases than to give the likeness of the deceased, in such a guise as would shadow forth, however, his Christian faith, representing him as trampling on the lion, as protected by and trusting to the emblem of the cross, &c. The way Viollet-le-Duc puts it is that after the period when the introduction of such recumbent figures became common, the tomb was in reality a permanent representation of the lying-in-state of the body, and there is a good deal in the design and appearance of many Mediæval tombs, which tends to bear out this idea, whether intentionally or not, from the period when this prominence was given to the recumbent effigy, the old Roman form of sarcophagus, with sides sloping inwards towards the base, nearly disappears for a considerable period, and is replaced by a straight-sided block or table, on the top of which is laid out the effigy, while the sides are occupied generally with ornamental architectural work, in the shape of arcades, panelling, or niches sometimes filled by miniature figures of saints or angels, or (but this is mostly in the late Gothic and Renaissance periods) by bas-reliefs representing other members of the family in prayer for the deceased. In the fourteenth-century period, and thence to the close of the Gothic period, it was common, especially in the richer and more costly tombs, for the recumbent figures to have canopies carved above their heads; an application in horizontal position of a feature in decorative architecture which properly belongs to the vertical position, and when thus employed horizontally on the top of the tomb looks rather like a misapplication of the feature in a position in which its original meaning, as a protection for the figure, is somewhat lost. The idea of the tomb thus formed, as a kind of lying-in-state of the body, is further supported by the practice in England of placing wooden canopies over the tomb and the figures, which give very much the idea of the figures reposing in a bed of state. These wooden canopies were, as we all know, subsequently imitated with far greater elaboration in stone, and carried out in such a manner as by a *tour de force* of masonic construction to appear almost as if self-supported over a considerable space, from pier to pier; for it is always between the piers of a church that erections of this description are found, partly because this was the most convenient site for a large tomb without too much cumbering the floor of the church, partly because the piers thus afforded a good and substantial *appui* to this somewhat venturesome piece of ornamental construction. Concurrently, however, with this class of tomb standing free between the piers, we have those which are placed in wall arches, generally also exhibiting a recumbent figure on the top of the sarcophagus or dais; but in the place of the plain arch of early Gothic we have, in complete and late Gothic, niches richly decorated with traceried canopies, often of great beauty and elaboration. In the fourteenth century it became not unusual to make the figures of brass or "latten," which appears to have been an alloy somewhat softer than brass, and more analogous in substance to pewter, though of yellow or brazen colour; and the addition of other metal ornaments to the stone tombs was not uncommon. Over the Beauchamp tomb at Warwick is an open cover somewhat in the outline of a roof, formed of brass railing; and such a finish or covering probably existed in many cases in which it has now disappeared. Commenting upon this feature in Mediæval tombs, Viollet-le-Duc, in one of his brilliant if not always quite probable suggestions, connects this fact with a possible very ancient custom of placing a cover of some other material over a stone tomb or sarcophagus, and points out that in the well-known Lycian tomb in the British Museum, the upper portion only imitates pointedly wooden construction, the lower being masonic in form and treatment, as if a wooden cover or hut with pyramidal roof were set upon the stone sarcophagus; and he suggests that the Mediæval metal canopy, taking the roof outline, is a survival of the same idea. His connecting link is in some tombs which form a group apart in the Vosges district, each of which consists of a square-sided sarcophagus with a curved conical top in a separate stone, exceedingly resembling the outline of the top of the Lycian tomb; and these Vosges tombs he sets down as "Gallo-Roman." His theory, stated under the heading "Tombeau" in his "Dictionary," is worth referring to, though we confess to a feeling that the great French architect and critic was sometimes rather too ready to accept a theory because it was interesting and brilliant rather than because there was definite proof of its truth.

The most elaborate development of the later Gothic tomb was that in which the sarcophagus and figure and all, instead of being merely placed under a canopy, were enclosed in a chapel, making a small building or complete architectural design in itself, within the cathedral or church. More important in structural design than these, and quite exceptional in their treatment, were the Scaliger tombs at Verona (to go back for a moment to an earlier period), in which the sarcophagus is displayed aloft on a platform raised on columns, and in its turn carrying columns which bear a vaulted canopy from which, again, there rises a truncated cone, differently treated in the two principal examples, though the main idea in each is the same. This conical finish is the fault of the designs, inasmuch as it is, in appearance at least, the heaviest part of the structure, and seems the more so in consideration of the very light and elegant character of the rest; and if the objection is valid against the Albert Memorial that its superstructure is too heavy to be balanced on arches and columns with no angle counterforts, it is certainly as much or more valid against the much-admired tomb of Can Grande, which is nevertheless one of the most brilliant and original of sepulchral monuments.

Towards the late Gothic period the unpleasing custom became common of carving on or beneath the tomb, not the peaceful sleeping figure of the deceased person, but the representation of his decaying body, emaciated by disease or corruption. There is a remarkable instance of this in Tewkesbury Abbey. This ghastly taste for the painful aspect of death, in the close of the Mediæval period, was the forerunner of the more confirmed Pagan view of death which was taken in so many of the Renaissance tombs, where the object seemed to be divided between glorification of the character and personality of the deceased and of his deeds when living, and the emphasising of the melancholy fact that he was no longer living,—a fact symbolised in an uncouth and what may be called a butcherly manner by the frequent introduction of the skull and cross bones, which blend in the strangest manner with the gay and florid ornaments characteristic of the Renaissance period, with which they are intermixed. Sometimes emblems of a less ghastly character are introduced, the inverted torch or broken column; but the whole idea of the Renaissance monuments is essentially Pagan, so far as symbolic ornament is concerned. Like everything else in the art of the Renaissance, however, the monuments displayed the determination to give the most prominent place to the figure, and they have afforded opportunity, as it is needless to observe, for some of the greatest work of the greatest sculptors. Without the figure, the monuments of the Renaissance are, for the most part, exceedingly elegant and finished in detail, but also weak and unmeaning. They lose for the most part the dignified architectural forms in which the Gothic monuments were cast, and assume forms of far less architectural beauty and meaning; they become a kind of elegantly ornamented picture-frame for a bust or a panel. There are fine exceptions to this, no doubt; and there is one form of monument which became common in England in the Renaissance period, and which in a peculiar degree combines dignity and elegance; that in which a recumbent effigy reposes under an arch, or more often under a couple of arches, carried at right angles to the length of the sarcophagus, and springing from light Classic columns, which seem like a Classic revival of the early Gothic screen or arcade before the sarcophagus. Monuments of this type are not infrequent in English churches, and are nearly always elegant in general effect, even when their details are not good. A curious example of a monument entirely retaining a Mediæval form, while every detail is Renaissance, is to be seen in the Browne monument in Battle Church, which is one of those representing the effigies of two people recumbent on a large square sarcophagus or altar panelled at the sides, with shafts at the angles, and with canopies rising behind the heads of the recumbent figures; everything just as we find it arranged in an orthodox Mediæval tomb of this class, but

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all the details in complete Renaissance taste; a combination by no means usual.

It would be, of course, a strange omission to touch upon English monumental designs at all without naming perhaps the most beautiful form of memorial which English architecture has produced, that of which the crosses erected by Edward I. in memory of his queen form the type, and as far as Mediæval work goes, the only type,—forming, indeed, a class by themselves, though they have been imitated in modern times. These display almost every characteristic that a monument pure and simple should display; they are conspicuous in form, elegant in outline, and, at the same time, present great opportunities for rich effect in detail, and they are examples of architectural design entirely unconnected with practical uses, and elaborated solely with the object of producing a beautiful memorial; and this is what monumental and memorial architecture in its true form should be. As we have already observed, it is almost the architect's one chance of entire escape from utilitarianism, and of doing a thing purely with the object of making it beautiful and expressive,—an end which the now nameless architect who worked for Edward I. certainly accomplished most successfully.

The artistic and, in one sense, unostentatious character of these crosses, as well as of many other memorials in the Middle Ages, was conspicuously wanting in the monuments which followed the period of the Renaissance. In calling the Elanor cross "unostentatious" we mean that there is in it and in many other Gothic monuments no glorification of the dead, only the expression of a pious memory of them in the past and faith for their future. In the post-Renaissance period this state of things was nearly reversed. Monuments became not things of beauty, but things of costly ostentation, of vulgar and audacious design, and were made the mouthpieces for the most fulsome and exaggerated praises of the deceased person and setting-forth of his virtues and liberalities. It is hardly worth while to dwell upon this phase of memorial design, as the only feeling which the contemplation of it creates is the wish that those who brought it into existence had been without the means of doing so. In another article we may consider what is being done and may be done with memorial and sepulchral architecture in our own day.

LONDON AND LONDON'S ARCHITECTS A CENTURY SINCE.

SIR JOHN HAWKINS, the friend and biographer of Dr. Johnson, member of his Tuesday evening club at the King's Head, Ivy-lane, and afterwards of the Literary Club at the Turk's Head in Gerard-street; annotator of Shakspeare, editor of Izaak Walton, author of a "General History of the Science and Art of Music," in five volumes quarto,—reprinted in two more merciful volumes, octavo, in 1872,—himself a composer of cantatas, which had their day of success; a magistrate of his county, chairman of the Middlesex Quarter Sessions, and knighted for his efficient and loyal services,—Sir John Hawkins, whose life of study and activity extended from 1719 to 1789,—is not without claims to commemoration in the columns of an architectural journal. He was the son of an architect and surveyor, says the "Dictionary of Music and Musicians," with graceful professional delicacy; but his family, who furnished materials for an earlier biographical notice, were contented to record that his father, though claiming descent from the admiral whose name in the story of the Spanish Armada runs so pleasantly in the enumeration,—Drake, Hawkins, and Frobisher,—followed at first the occupation of a house-carpenter, which he afterwards exchanged for the profession of a surveyor and builder. His son acquired a fair knowledge of Latin at school, and thus in possession of a by no means valueless element of liberal education, commenced the special training which was to qualify him for his father's profession. He was placed, we read, "under the tuition of Mr. Hoppus, the author of a well-known (well known in 1814) and useful architectural compendium" (still useful in 1814), published in 1733, 8vo., and entitled "Proportional Architecture: or, the Five Orders regulated by Equal Parts," and went through a regular course of architecture,—of such architecture as this title indicates,—and of perspective, which was no doubt taught on much sounder principles. A cousin, however, induced him to turn to the law, which he did with energy and success, and though he attained to fortune mainly through his marriage, the marriage itself came about through the distinction which he gained by combination of talents for business with the sustained cultivation of literature and the polite arts.

It is probable that the polite art of architecture suffered no great loss by the diversion of his great powers of application to other arts and occupations. It is pretty clear that he was loyal to his instructor and continued true in theory, where he did no harm to the mechanical system of "the well-known and useful compendium" of Mr. Hoppus. He quite appreciates the absurdity of the escapade of Johnson venting spite against Scotchmen generally in an attempt to discredit Myine's design for Blackfriars Bridge with elliptical arches by mathematical arguments in favour of circular obtained from a friend; but his own objections are not much more respectable for being obtained from the "Compendium." "I have already remarked that Johnson was unskilled in the science of architecture, and I might have added that he was a stranger to the very rudiments of it. He could not else have failed to notice in the edifice here spoken of one of the most egegious errors that ever disgraced a structure of its kind; columns disproportionate in the ratio between their heights and their diameters. The proportion of a column is taken from that of the human figure, which at a medium is, in a man, sesquioctave of the head, and in a woman sesquional. The computation of columns by modules or diameters comes to much the same, and, according to Palladio, gives to one of the Doric order the masculine proportion of eight of those measures, and to one of the Ionic the feminine of nine. Proportions thus adjusted by nature admit of no deviation; whenever that is attempted deformity ensues."

That new demands for convenience may suggest new motives of elegant proportion he is by no means disposed to allow. If the established proportions of beautiful forms will not fall in with convenience, convenience must go unornamented,—a hard saying, though no doubt better than throwing over convenience. "Proportion is not to be wrested to by-purposes, and where beautiful forms cannot be introduced they must be given up and ornament yield place to convenience." "The result of an inquiry," he says, "into the principles into which the pleasures of the eye and ear are resolvable, will be a thorough conviction that all of what we understand by the terms symmetry and harmony, has its foundation in mathematical ratios and proportions that exist in all the modifications of matter, and are but emanations of that Power which has ordered all things in number, weight, and measure." If this large principle is but largely interpreted there is much to be said for it; but no such large interpretation is to be obtained from Hawkins, who proceeds to put architectural symmetry and proportion into a strait-waistcoat by confining them to the musical diatonic scale. "Of these the principal are the equal 1 to 1, the sesquialteral 2 to 3, the sesquitertian 3 to 4, and the duple 2 to 1, answering to the unison, the diapente, the diatessaron, and the diapason, the sweetest concords in music."

The first volume of Hawkins's "History of Music" appeared at the same time as that of Dr. Burney, another musical friend of the most unmusical Dr. Johnson, who had no more ear for art,—"Would that it were impossible!" was his response to the remark on the difficulty of some beautiful music,—than he had an eye for nature. "He that has seen one green field," he said, "has seen all green fields." The work of Hawkins, it is now admitted, has more sterling value than that of Burney,—but Burney had the rewards of attractive style and skilful narrative, in credit for superior merits which he did not possess; the sager verdict of contemporaries in his favour has been reversed on appeal. What an interesting book might now be written on ephemeral reputations,—reputations that have pre-deceased their owners or that have, happily for them, just lasted them their lives! Let us hope there are none such flourishing in our day, for the injury involved to competitors is very sad indeed. His life of Dr. Johnson was also doomed, but more justly, to suffer an eclipse, and has never been put into serious comparison with that of Boswell, who had far inferior opportunities of intercourse with their common friend. And yet if we would know Johnson thoroughly, this biography must not be neglected; it is our sole authority for many important characteristics and details respecting him, and is worth reading on other accounts; the author, like Boswell, not only interests us in the circle of friends and contemporaries of Johnson, but especially does he gives us striking glimpses of the habits of the time, and quite unconsciously, a lively conception of his own character, not without interest in itself, and, as a type of opinions and principles, accepted in his day. What a contrast to the present was the London of his day! —we must not say of our own day, for there are those of us who are septuagenarians who can recall a London,—a London without cabs, omnibuses, and railroad, or blue-coated policemen,—a London of Exeter Change, and Old London Bridge, and Bartholomew Fair, in which Johnson, Boswell, and Hawkins, would have found comparatively little to surprise them, and might soon have felt themselves at home. But the London of those days was but as the first indication of the fruit to the full-grown pumpkin. His friend, Dr. Birch, "had the curiosity to measure the circuit of London by a perambulation thereof," including Southwark, and this he effected,—recruiting his spirits with a glass of brandy at Stepney, between nine in the morning and three in the afternoon. "According to his rate of walking he computed the circuit of London at above twenty miles," —very good walking too. But even between the date of this walk and its record, building has so far proceeded that Hawkins adds five miles more to the estimated circuit. Progress, or change at least, had gone on and was going on as conspicuously in social aspects and concernments. Some formalities of costume, not too remote for memory, could already be noted as obsolete; of Dr. Barker, his early contemporary, he says,—"Physicians *in his time* were used to be full dressed; and in his garb of a full suit, a brown tye-wig, with a knot over one shoulder, and a long yellow-hilted sword, and his hat under his arm, he was a caricature." But this result of manifest grotesqueness was due to the wearer, for we are told elsewhere, "The Physicians in Hogarth's prints are not caricatures; the doctors in consultation in such a dress, each smelling a gold-headed cane shaped like a parish-beadle's staff, are pictures of real life in his time, and myself have seen a young physician thus equipped walk the streets of London without attracting the eyes of passengers."

Again: "The clergyman was now become an amphibious being, that is to say, both an ecclesiastic and a laic; the apron, the badge of mechanic occupations, in all its varieties of stuff and colour, was laid aside; physicians and lawyers were no longer distinguishable by their garb; the former had laid aside the great wig, and the latter ceased to wear black except in the actual exercise of their professions. In short, a few years of public tranquillity had transformed a whole nation into gentlemen. In female life the refinements were also to be noted. In consequence of a better education than it had been usual to bestow on them, women were become proficients in literature, and a man might read a lady's letter without blushing at the spelling. The convenience of turnpike roads had destroyed the distinction between town and country manners." Among what the author rather sarcastically terms great improvements in town life we find this enumeration:—"Public entertainments are now enjoyed in an immediate succession; from the play the public are generally able to get away by eleven,—the hour of assembling at other places of amusement; from these the hour of retirement is three, which gives till noon the next day,—nine hours,—for rest, and after that sufficient time for a ride, auctions, or shopping before five or six, the dinner-hour."

No words of blessing are given to the birth of that form of literature now so predominant, —the modern English novel,—"books of entertainment distinguished by the corrupt appellations of novels and romances. The first publication of the kind was the 'Pamela' of Mr. Richardson, which, being read with great eagerness by the young people of the time, and recommended from the pulpit, begat such a craving for more of the same stuff as tempted some men whose necessities and abilities were nearly commensurate to try their success in this kind of writing."

Severe and not without much justification are his strictures on the school,—on the sentiment

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and sentimentality that are "the cant terms of Richardson and his admirers;" and on "that cant phrase [Fielding] goodness of heart, which is used every day as a substitute for probity, and means little more than the virtue of a horse or a dog."

But, in truth, Hawkins, who doubts whether authorship is a creditable profession, and calls Goldsmith an idiot for preferring it to soliciting the great for favours, was not a man to appreciate what there was of true nobleness and sound principle in Henry Fielding, whose life comprises a contradiction as enigmatical as that of the relation of dissoluteness and political profligacy in the early life of Charles James Fox to the virtues of later days, that make him still an object of personal and political reverence. The chairman of the Middlesex Quarter Sessions sneers at "the disreputable station" of Fielding as a "trading justice"; but Fielding did his best to make the station reputable while he held it, at the cost, as he says, "of reducing an income of 500*l.* of the dirtiest money upon earth to little more than three hundred," and his report on crime in the metropolis is worth gold as compared with Hawkins's optimist enumeration of the beauties of the criminal law and its administration. Fielding, shocked at the scenes which took place at public executions, recommended the change which has been but so recently introduced. He used a remarkable argument. He said that when he had seen Mr. Garrick in the character of *Macbeth*, and the murder of *Duncan* was understood to be proceeding behind the scenes, it was not too much to say that he had seen the hair of the audience stand on end.

It is curious to find the beverage which is now relied on for assistance in weaning the intemperate from the Circean cup of the dæmon alcohol denounced as its ally. Johnson is commiserated if not contemned for his "unmanly love of tea." The epithet is an old one, and odd is the qualification as "signs of effeminacy," of demeanour such as could be thus described:—"Whenever tea appeared he was almost raving, and by his impatience to be served, his incessant calls for those ingredients which make that liquor palatable [why not say cream and sugar?], and the haste with which he swallowed it down, he seldom failed to make that a fatigue to every one else which was intended as a general refreshment." Such a devotee might well be expected to come down heavily on Jonas Hanway and his "Essay on tea as pernicious to health, obstructing industry and impoverishing the nation, &c.," and which coupled tea,—harmless necessary tea,—with demoralising and degrading gin. But Hawkins himself concedes, without hesitation, that Mr. Hanway was right in asserting "that the practice of drinking tea is productive of harm among the lower classes of people as certainly to be admitted," and seems to sympathise with serious grudgingness in what Swift only vented as a witty sarcasm,—that the world must be encompassed, that is to say, by a voyage to the East Indies for tea, and another to the West Indies for sugar, before a washerwoman can sit down to breakfast.

Johnson evidently was not a man to reform manners, but Hawkins believes that had he entered Parliament, of which there was once a dream, he might have checked the introduction there of such unauthorised words and phrases (they have all made good their ground) as the following:—"a truism,—reciprocity,—living in habits of friendship,—a shade of difference,—that line of conduct,—sentiments in unison,—blinking the question,—I am bold to say,—I should then commit myself,—and others equally affected and singular."

Hawkins, as infirmities grew upon him, made vain trial of the efficacy of the waters of Islington Spa; a notice which misleads the writer in the "Biographie Universelle" into supposing a conflict of authorities as to whether he died at Spa in Belgium or in London.

Sundry criticisms of contemporary architecture, which can be gleaned from the pages of the pupil of Mr. Hoppus, are not without interest. "Vanbrugh and Hawksmoor, he says, had such ideas of beauty and harmony as have no archetypes in the material world." He would have been quite in accord with Mr. Fergusson's appreciation of Blenheim. "Altogether the palace looks as if it had been designed by some Brobdingnagian architect for the lodging of their little Gulliver." Hawkins continues, as to Hawksmoor, "in an evil hour he was employed by the Commissioners for building fifty new churches, as also by a parish in the city, St. Mary Woolnoth, in the re-edification of an old one, and has left his mark behind him in several parts of the kingdom."

James and Kent are not more mercifully dealt with. Kent we have still with us, conspicuously in the Horse Guards and north front of the Treasury Buildings. "They were mere decorators, and could do little more than design a saloon, a gallery, or a screen."

But Campbell and Gibbs he appreciates as men of genius:—"The former designed the best house in the Kingdom,—that at Wanstead, in Essex, built by the Earl of Castlemaine (see Fergusson, 'Modern Architecture,' p. 287); the latter St. Martin's Church, and other edifices (among them the Radcliffe Library), that are an honour to his memory." The Wanstead House seems to have been exactly reproduced,—see the illustrated papers,—in that palace of the Dukes of Hamilton which even now is giving up its contents to follow in the fatal train to the auction-room.

But Ripley comes in for a contemptuous notice, and somewhat unfairly, not exclusively on account of his art or want of art. "Columns thus disproportionate,"—the reference is to those of Mylne,—"but in a less degree, are also to be seen in the portico of the Admiralty Office, designed by Ripley, who, from a carpenter that kept a shop, and also a coffee-house, in Wood-street, Cheapside, by marrying a servant of a minister, obtained a seat at the Board of Works." The true introduction to the minister seems to have been conducting alterations in his residence, to which the marriage with the servant,—not necessarily an under housemaid,—was incidental. He succeeded Vanbrugh in the post over the head of Kent in 1726. Horace Walpole held Ripley to be deficient in taste, but speaks in his favour as excelling "in the mechanic part and in the disposition of apartments and conveniences,"—how justly those must decide who are familiar with the interior of the building which was called in Nelson's days by the aspirants for promotion and its insignia, the "Lace Manufactory."

Pope finds a niche for Ripley in the "Dunciad," and satirises him twice elsewhere with a pertinacity that reminds us that the supplanted Kent was patronised by Pope's friend, the Earl of Burlington:—

> "See under Ripley rise a new Whitehall,
> While Jones and Boyle's united labours fall."
> *Dunciad*, iii., 323.

In the "Imitations of Horace," II., i., 186:—

> "Who builds a bridge that never drove a pile?
> Should Ripley venture all the world would smile;
> But those who cannot write and those who can
> All rhyme and scrawl and scribble to a man."

Lastly, in the fourth Moral Essay, the satirist in guise of moralist, contrives to spit upon the same envenomed rapier the architect and his patron, Bubb Dodington (Lord Melcombe):—

> "Heaven visits with a taste the wealthy fool,
> And needs no rod but Ripley with a rule;
> See sportive fate, to punish awkward pride,
> Bids Bubo build, and sends him such a guide!
> A standing sermon at each year's expense,
> That never coxcomb reach'd magnificence."

Pope finds room in a note for a sneering reference to the carpenter's shop, which Hawkins might have consistently respected, considering the original trade of his own father; and, on the whole, the tendency of these attacks is to dispose one at the present day to listen favourably to any evidence in favour of Ripley. As to Bubb,—"Syllabub," as a contemporary nicknamed him,—his own memoirs justify satire of any severity.

Haggerston Churchyard.—Through the kindness of Lord and Lady Brabazon, the churchyard of St. Mary's, the parish church of the most densely populated district in Haggerston, has been transformed from a neglected and unsightly wilderness of dilapidated graves, broken gravestones, and straggling tufts of coarse grass, into a fresh and pretty garden to be open for the recreation and enjoyment of the public. The formal inauguration of what is a small oasis in a dreary surrounding of crowded dwellings of poor people was made on Saturday afternoon last, when a special service was conducted by the Rev. George Wingate, M.A., the vicar, who, with Messrs. F. E. Brown and Liquorish, churchwardens, has helped forward the work.

HINTS FOR THE MANAGEMENT OF COMPETITIONS.

BEING one of those who signed the memorial to the Royal Institute of Architects relative to the regulation of competitions, I have been looking for the improvement that was reasonably to be expected from the adoption of small-scale sketches along with the appointment of a professional referee or adjudicator; but in vain.

I have been observant of competitions since the important one for the design of St. George's Hall, and the following one for the Queen's College, Liverpool, more than forty years ago, in both of which the late Mr. H. L. Elmes was victor, and have seen the "Conditions and Instructions to Architects" of not a few. But I remember nothing worse than some of the most important of the late ones since the action of the Royal Institute, whose object and that of the Conference was evidently to mitigate and put them on a just basis. When, on a Saturday morning, I open the *Builder*, and look out through its pages from a somewhat lonely rural retreat into the busy world of architecture which it discloses, with glimpses of the adjacent worlds of art and literature beyond, the most disagreeable scenes that meet my mental eye are still those connected with competitions. The very word, indeed, at the head of the paragraph or article promises the exposure of some act or scene insulting or dishonouring to the profession.

But lately a copy of one of those tightly-binding schemes of "Conditions and Instructions to Architects" for an important building fell into my hands, and with this I was perfectly disgusted. First, with the utter forgetfulness of what was due to the professors of an art which is generally supposed to clothe its followers with gentility; and, secondly, with the immense and needless amount of work entailed upon those simple enough to engage in it, with no very satisfactory guarantee for justice in the decision. It appeared to me entirely out of harmony with the age. While all other professions are going in the direction of short hours and long holidays, competitions are taking architects back to serfdom. As I read this scheme of a competition in which successful drudgery in the first round earned for the victor a title to the quadrupled drudgery of the second, the whip of the slave-driver which it called up grew less painful to my imagination than before, and hewing of wood and drawing of water in the open air to which the Israelites condemned the inhabitants of Gibeon for deceiving them, seemed pleasant employments. The author of the "Song of the Shirt," in bewailing the case of certain poor needlewomen, complains that bread should be so dear and flesh and blood so cheap; but it is the brain,—the organ of the mind with all its Godlike powers, including the "vision and the faculty divine,"—that is held cheap by the patrons of architecture. When councils and boards, in their irreverent manner, call upon the architects of the world to furnish them with a design for a town-hall, art-gallery, or museum, to cost 100,000*l.*, or more, with the understanding that only one of them is to be paid for it, they should be told what the art is which gives to the great cities of the world their chief interest, and is capable of increasing the attractions of their city, and what the productions of that art are worth. A good plan and exterior design of a building, to cost the sum just mentioned, though only in sketches, should be worth 1,000*l.*; and were the competitors paid for their time at the rate at which I have known some surveyors to be paid for infinitely lower work, such as valuing land and houses, the whole 100,000*l.* would be insufficient for the purpose. High art purifies the minds of its true votaries from worldliness, but it does not so etherealise their bodies as to enable them to live without dining.

Than the *manner* of their announcements there is perhaps nothing more ridiculous to be found in any newspaper or journal that appears, which is saying a good deal; and these announcements will surely some day be looked back upon as curiosities of advertising or of literature. What *can* be more ridiculous than promoters of a competition asking an inestimable favour from a liberal profession, with the air of men conferring an obligation? And when it is their interest to attract the highest members of that profession to the competition, inviting to it in terms calculated to repel, and which ought to repel, the very lowest?

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The matter is made worse by the inadequate means of adjudicating. The employment of a professional man for this purpose is, perhaps, an improvement on the practice of miscellaneous committees selecting by the highest number of votes; or, as in the Raikes Memorial Church competition, by the advice of "persons well versed in architecture," who would most likely advise them to take the worst piece of architecture in the lot. But there should be more than one adjudicator. No one man, however eminent, is sufficient. If it is in the multitude of councillors there is wisdom and safety, there cannot be much of either in one. Two would be not merely twice, but four times as safe as one, and the advantage of multiplying them would, I fancy, increase in something like the ratio of the squares of the numbers. I think it utterly absurd to let the object of a competition,—the securing of the best possible design,—with the interest of the profession and progress of art involved in it, depend on the sense of justice, taste, and critical acumen of any one man. It limits the reach or final results of the competition to his mental stature, for what is above him he will reject. There may be designs submitted whose beauties are of too subtle and refined an order for his powers of appreciation. Or he may have a leaning towards one style, or sub-style, unfavourable to some of the very best designs submitted. He may have achieved his eminent position by intellect only, while very deficient in art-feeling. But the work of an art whose breath is poetry and capable of clothing the idea of religion and God, cannot be judged of by intellect alone. It is more by sympathy, by depth and delicacy of feeling, along with purity of taste, than by critical judgment that we can understand or appreciate the merits of works of art. But supposing his mental powers equal to his task, his moral may not be; in saying which I am influenced solely by my knowledge of human nature, which would forbid me to trust in such a matter Aristides the Just, were he to live again, and to his moral sense added the art-genius of Phidias. He should not be a man of like passions with ourselves to whom such a task was committed.

Viewed in another light, it is out of unison with English institutions and in harmony only with despotism and trial without jury.

With these sentiments and the belief that example is better than precept, even when only imaginary, I cannot resist the impulse to offer, in all diffidence, the following model for a competition, trusting it will be regarded in no other light than as suggestions to all whom they may concern, and not as a rival system to any put forth or to be put forth by the Royal Institute of Architects:—

NEW MUNICIPAL HALL.

Conditions, &c.

The Mayor and Council of Wisely being about to erect a new municipal hall, and being anxious to secure to the city the prestige of a first-rate structure, have determined to make the design of it the subject of a public competition, as the surest way of obtaining their desire.

They hereby respectfully invite architects to furnish designs, assuring them that, mindful of what mental faculties must be exerted in their production, they have, in drawing up the following conditions, had an eye to sparing them all needless labour and waste of their invaluable time; asking only, indeed, as will hereafter appear, for what is essential to the general expression of the design.

The competition will be a single one, the council being advised that the scale of the drawings hereafter mentioned, though small, is quite sufficient to allow every feature and distribution of features on which the merits of the designs depends to be fully rendered therein.

Touching the matter of adjudicating on the relative merit of the designs which may be sent in, and selecting the most meritorious one, being advised that artist-painters and sculptors, accustomed to draw the subtle lines of the human body and to make the tenderest strokes of art are, after architects, most sensitive to the harmonies and graces of architecture; and believing that in the multitude of counsellors there is wisdom and safety, have engaged one artist-painter and one sculptor along with two architects, practitioners of different styles, to be the judges.

These gentlemen pledge themselves to see nothing in the drawings which may be submitted to them but designs, and to judge them by their intrinsic merits only, uninfluenced by delicate finish on the one hand, or sketchiness on the other, if they clearly exhibit the design; or by love, or hatred, or envy of their authors, or supposed authors. Conceiving the proper object of competition to be imperfectly attained if the finest exterior were selected along with inferior plans, excellence of plan being so important in a practical point of view to the public, the adjudicators are resolved to give at least as much heed to merit and fitness of plan as to beauty of exterior.

The council pledge themselves to abstain from any interference with the adjudicators. They also pledge themselves that no member of their body or of the bench of adjudicators will take part in the competition.

Each design to be represented by the following Indian-ink drawings to a scale of 16 ft. to an inch.

Plan of the principal floor.
Plans of first and second floors.
One transverse section.
Front elevation.
One side elevation.
One small perspective view.

The elevations and perspective view to be simply shaded in Indian ink. The latter to be correctly drawn from the plans and elevations of the same scale, without ornamental details (unless the competitor prefer to give them) merely to display the outline of the composition and the main masses of shadow.

For the better comparing of the views with each other, the competitors will please place the plane of the picture at the north-east angle, and to make an angle of about 30 degrees with the front.

The basement plan being almost entirely governed by the principal plan, and having no influence on the artistic scheme, is here omitted. The successful architect will supply it along with all other working drawings to the usual larger scale.

No less a number of drawings than those stated can be deemed sufficient.

The Council wish to have, in addition to the apartments named in the schedule, a central hall, of dimensions proportioned to the building; a grand staircase, and not less than two inferior staircases; and some crowning detached feature above the roof over the central hall, or otherwise in the nature of tower or pavilion to give prominence to the building viewed from a distance, and assist in elevating its character. These particulars are named merely to give the competitors some idea of the scale of magnificence desired, and to prevent any wide difference between their designs in respect of cost.

The warming and ventilating, except so far as their consideration may affect the form and general distribution of the apartments, need not have attention. Nor need the drainage beyond getting water-closets, urinals, &c., contiguous to outer walls, so that no drains need pass under the building. The successful architect will attend to these.

The style of the building to be in harmony with its surroundings, of which a photographic view will be furnished to each competitor along with the plan of the site, &c.

Any competitor may submit two designs for the exterior, or two plans, provided that in each case either may be adopted or will fit the rest.

With regard to the total cost of the building, as, in addition to what is above stated, the number and size of the apartments and width of essential passages, with the height of each story, are all given in the schedule, and as walls must be of a certain thickness, the council presume there cannot be much difference of cost among the designs which may be sent in, provided each competitor simply aims at making the building in architectural character worthy of the city.

The Council have been advised that the building will cost from 80,000*l.* to 90,000*l.* Any design exceeding the latter sum, unless it can be so denuded of sculpture as to bring it within that sum without prejudice to its architectural merits, must be excluded. No estimate, therefore, need be sent in.

The drawings to be singly mounted, so that the corresponding parts of different designs may be compared with each other, as plans with plans, &c.

The designs to be sent in within three months from the above date, each either signed by its author or with a motto, repeated in a sealed letter containing the name and address of the competitor, which letter will be returned along with his drawings with the seal unbroken at the conclusion of the competition.

The Council pledge themselves that no delay which they can prevent shall occur in bringing the competition to a conclusion; when 2½ per cent. on the proposed cost will be divided among the competitors, including the successful one, in sums varying according to the order of merit of their designs. The author of the highest in merit will be employed to execute his design, and allowed clerk of works, travelling expenses, &c., as usual.

All the designs whose authors are willing shall be publicly exhibited after the awards have been made.

Should any accident occur to any of the drawings during their lodgment with the Council, the Council will, of course, make just compensation to the owners.

Designs of unsuccessful candidates shall be returned free of expense.

Whatever may be thought of the above, it gives competitors, in sufficiently expressing their designs, but one-fifth of the usual labour (the perspective view would be produced in a few hours) with ten times the chance of justice, which renders the remuneration named almost sufficient.

For such an advantage as a public competition, rightly conducted, holds out to its promoters the increased chance of obtaining a first-rate design, 2½ per cent. beyond the 5 per cent. which they would in any case have to give, would be a very reasonable outlay, while the competitors would be not very ill paid in proportion to the merit of their designs. I agree it will be seen, with Professor Kerr, that all the competitors should be paid.

I should have added a non-professional man or two to the bench of adjudicators if qualified men in the present state of education were not so rare a phenomenon. Poets should be able to judge of architectural merit, but literary men generally are feelingless on the subject, and till English education grows to something like that of ancient Greece we must be content with architects and artists alone for the purpose in question.

Objectors to the smallness of the scale adopted for a final competition I would ask, do we not judge of the comparative merits of two or more existing buildings by their engraved illustrations, often to a scale of 50 ft. to 100 ft. to an inch? All the details cannot be given, but I believe sufficient can be given to show, along with the composition and chiaroscuro, which can fully display themselves, the merit and beauty of the whole.

I do not see any difficulty in discerning degrees of merit of design through any amount of high finish, or the want of it, in the sketches. There is not as much difference between sketches and full drawings in architecture as there is in painting. Mere masses of colour or of light and shade, with little or no drawing, constitute a sketch in landscape. But architects cannot design in light and shade, though they may think in light and shade. All the lines must be put in, however faintly, that the scale admits.

It is not the adoption of sketches instead of full drawings, that causes the reduction of labour. It is the reduction of scale almost alone.

To conclude. Competitions wisely and justly conducted must become a useful engine for putting men into their right places, and raising indigent merit. Young ambition could not have a surer ladder by which to climb, nor sharper "spur to prick the sides of his intent." But, conducted as they generally have been, they become a species of gambling at the lower end of the profession, useful only in bringing down its moral tone and dignity, and cumbering the earth with commonplace erections.

SAMUEL HUGGINS.

St. Pancras Workhouse Competition.—Mr. Arthur Cates, Crown surveyor, to whom the competition designs by the five selected architects were submitted for his professional opinion thereon, has presented his report to the guardians, which has been published. Mr. Cates limits the contest to two of the competitors, one of whom is Mr. H. H. Bridgman, architect, of the Poultry. The contemplated expenditure, we understand, approaches 60,000*l.* Our readers have been informed of the earlier stages in this matter.

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THE HAMILTON PALACE COLLECTION.

THE interest excited by the promise of the second portion of the Hamilton Palace Collection, composed of some of the Italian pictures and a further instalment of rare furniture and decorative objects, crowded, it can be imagined, all through the middle of last week the rooms in King-street. Among the pictures, several bore a reputation, though the generality may be said to belong rather to a style and period of art which within the last few years we have come to look upon with an indifference that would, we suspect, sadly shock the original owners who gathered the collection.

The large Botticelli, "The Assumption of the Virgin," was made familiar to the artistic world at the Burlington House Exhibition of 1873, and stands, if not among the most beautiful of the early Florentine master's works, certainly among his most interesting. Vasari has spoken at some length of the picture, and has told one of his familiar stories respecting the envy of the artist's detractors succeeding in having the picture covered from view on the accusation of heresy against the painter and the patron who employed Botticelli to paint the picture for the Church of San Pietro Maggiore. Perhaps what is unsatisfactory in the work, with its very large number of figures, may be accounted for by the tradition that the design was dictated to the painter, and was not one of those simple earnest works of love for which he obtained the reputation he has borne at all times in Italy, but only more recently tardily awarded him in England, France, and Germany. To those familiar with Florence, the view of the Tuscan capital, Pistoja in the distance and the de' Medici villa Careggi, will curiously remind them of the beautiful valley of the Arno and the hills round Florence. As regards the picture itself, though it has undergone repair, it cannot be said to have been really seriously injured. By its side two small Fra Angelicos, though not by any means highly representative of the master, deservedly attracted the attention of the public. Hanging on the same wall in Messrs. Christie's large room, the interesting Bronzino portrait of Leonora di Toledo may be regarded as thoroughly characteristic of the painter, who is so well represented in the National Gallery by a picture of exactly the same period, and, curious to say, of the lady's husband, Cosmo Duke of Tuscany. The Tintoret portrait of an "Admiral in Armour" fully realised the expectations of the promise which the catalogue held out to those unfamiliar with the collection. The same may be said of the two or three other Tintorets, notably the "Descent from the Cross," in the harder style of the master, and most interesting, alike from its exquisite colouring,—much resembling Paul Veronese,—and the life-like portraits of the donors; equally fascinating in colour was the "Presentation." Concerning the so-called Titian, representing the painter's daughter, in spite of the very handsomely-carved Italian frame which surrounds the picture, there cannot fail to continue to be expressed much doubt, while the brilliant so-called Giorgione, which so conspicuously occupied the centre of Messrs. Christie's second room, will, we suspect, to all familiar with the famous "Fête Champêtre" of the *Salon carré*, at the Louvre, and the story attached to it, that it is by Titian, only serve to confirm that belief. For brilliancy and glow of Venitian colouring, it is long since the world has had brought before it so characteristic a specimen of Italian art and the traditions of the founders of the modern school of painting. The possession of this treasure alone entitled the Hamilton collection to the fame it has long borne. Fortunate, indeed, is the National Gallery to have obtained this extraordinary specimen, which, to the student, will be found to afford every necessary element of instruction in the technical management of transparent colouring and "ground," which constitutes so curious a charm in the works of the Venetian masters. Attributed to that school, the landscape thus vaguely named we should be inclined to assign to Domenico Campagnola, the friend of Titian, from the resemblance of the treatment of the background to that to be seen in his numerous engravings. A so-called Leonardo da Vinci small portrait, belonging, perhaps, rather to the Venetian school, and a Madonna by Francia, attracted during the view not a small degree of attention from those unfamiliar with the collection, as also the so-called Mantegna portraits of Luigi Gonzaga, Duke of Mantua, and his wife, but concerning which it would be interesting, with the information now possessed respecting the early Italian masters, to hear well discussed, in spite of the authority of Vasari and that most doubtful and untrustworthy, though respected of all authorities, Dr. Waagen, whose name is constantly quoted by the catalogue compilers. Another picture of Mantegna, a monochrome, is by the master, though beyond this fact it is of no great interest.

In works of the period and by the masters which the great galleries now desire to possess, though the Hamilton collection is not, as will be seen, wanting, the generality of the gathering is, so far as we see by this instalment, not very strong. Times have seriously changed since the days when the Hamilton Gallery was formed, and Guercino, Domenichino, Sassoferrato, Parmegiano, Guido, Salvator Rosa, and the Caracci were in vogue. To those brought up under the new influences it is not a little calculated to inspire a spirit of irreverence to find a number of works of the very smallest merit not only composing a great and famous gallery, but bearing names which the slightest acquaintance with the works of the past shows to be ridiculously false. It is to be hoped that one of the results of the efforts of our modern art directors has been to spread among those who are interested in art, a power of selection which it would appear was not exactly possessed by our ancestors. We live in an age of fierce criticism, which has opened our eyes, or afforded us at least the means of opening our eyes. The result of the sale of the Hamilton Gallery will curiously come to show how by the light of modern criticism the art and taste of the past are now appreciated.

Were every one to be guided in his choice by the standards which of late have been set up by those whose opinions we must respect, it would, we are afraid, go hard with much that composes the Hamilton Palace collection. It is to be regretted indeed as the sale creeps on, that as yet, nothing has been shown (among the furniture) belonging to the periods which the taste of the most instructed has agreed in declaring to be the best. From an historical point of view it is impossible to award the utmost interest to the wonderful pieces of "Buhl" work which the collection contains, and the exquisitely-delicate marquetry creations of the cabinet-makers of the court of Louis Seize and Marie Antoinette. It is difficult, however, to have to continue to admire an uninterrupted series of Rococo creations unbroken by the presence of a single specimen of work belonging to earlier and none the less decorative periods of art. It is sad to see so evidently displayed the mere desire of the creators of these costly pieces of work, to produce a "show," which, it is true, was the sole condition required from them. When Louis XIV. built Versailles with its myriad distracting mirrors, crystal chandeliers, and pompous gilt carvings, the homely decoration of the previous periods was out of place, and only the creations of a Lebrun or a Boulle could harmonise with a degree of ill-placed splendour that, to the grief of all true lovers of art, has only too deeply left its mark in the history of decoration. Where are the more refined but none the less palatial and grandiose creations that adorned the Venetian and Italian palaces? It is to be regretted that in addition to the French Revolution to which we owe the presence in England of these magnificent pieces of Louis XIV., Louis XV., and Louis XVI. furniture, the sales that of all time have taken place of the contents of the great *palazzi*, in the original home of all the splendours of Versailles, have not enriched the Hamilton collection with some specimens to break what promises to become somewhat monotonous.

Public interest, however, was none the less excited during the show last week, by the two magnificent "Buhl" *armoires* designed by Lebrun, and formerly in the Louvre; the several "Buhl" clocks, with their characteristic decorations; the Louis Seize upright secrétaire, with its pretty inlaid festoon figure of Silence in the central panel; the palatial Florentine *pietra dura* cabinet; and the various ormolu chandeliers and other grandiose creations of the seventeenth and eighteenth centuries. Among the what are understood as precious objects which composed this second portion of the sale there were some most valuable specimens of gold and silversmiths' work; two German sixteenth-century cups of the type that has long been rendered familiar by the so erroneously termed "Cellini vase" in the British Museum, one the design of George Roemer, who has inscribed his name on his work, with the date 1580. Among the richly-chased, embossed, and showy plate, presentoirs, ewers, and dishes, it was curious to note the sobriety and good taste of a Gothic silver-gilt cup, as if to recall the attention, in the midst of so much unnecessary ornament, to the true canons of decorative art. The more costly objects in jade, agate, and crystal, among them a delicate Italian pax,—not like Francia's famous work at Bologna, or Maso Finiguerra's still more interesting "Annunciation" in the Bargello at Florence, in *niello*, but in relief,—and smaller pieces of plate, attracted, as can be understood, all through the week a great share of the attention of the visitors. It is to be regretted that there should still be evidence of some remains of the old spirit in which the catalogue of the Strawberry Hill sale was compiled, when a statuette of the famous figure of the sturdy Nuremberg artist, Peter Vischer,—an artist who was not ashamed to wear his leathern apron, and thus proudly portray himself to posterity,—should be designated as "a silver figure of a Russian smith" (No. 627).

Before concluding, let us not neglect to mention the interesting if somewhat pretentious bust by Thorwaldsen of the first Napoleon, and the architectural drawing (in *bistre*) by Sansovino, of the decoration of Sta. Maria del Fiore, designed by him for the visit of the Pope Leo X. to Florence; though we can ill conceive why the beautiful cathedral was thought to need any such adornment, even at the hands of so refined an artist as the architect of the Libreria or the Zecca at Venice.*

APOLLO AND DIANA.

So great a charm has the memory of our early Classic studies in after-life that they are constantly referred to with unabated pleasure, and in example of this, in more than one modern instance, have British statesmen turned, as to a recreation in the intervals of their political labours, to the adding to the many existing translations of the Greek poets. The love of the dead languages as treasure-houses of noble thoughts and poetic imagery, is still full of life, and scarcely a public debate takes place without recourse to them for illustration; and, wider than this, the evergreen character of the old Greek genius and Roman force and grace is evidenced by our frequent reference to them in literature, conversation, and art.

As a part of this permanent love for the old Classic sphere of thought and work exists the regard in which we hold those of the antique statues which have come down to us through so many perils and adventures. And although we no longer look on them as representations of real divinities, the interest in them seems to be almost as great as when they received the homage of actual religious worship. The art now, rather than the gods it personifies, is respected, but the amount of admiration is as intense perhaps in the art archæologist as formerly in the Greek devotee.

The Apollo of the Vatican and the Venus of the Uffizi Palace have received maybe as much adoration in modern times as they attracted of old; and the group of the Laocoon, although he was not a god, but only the priest of one, has been made the subject of a whole book by Winckelman, while Pliny only gave it a phrase, although this may be acknowledged as one of the highest admiration, as he speaks of it as "the most excellent work of fine art which had ever been executed."

These, and a few other ancient statues, ap-

* At Saturday's sale, the National Gallery acquired no fewer than six of the Italian pictures. The Botticelli "Assumption," for 4,777*l.* 10s.; by the same master, "Adoration of the Magi," 1,627*l.*; the so-called Leonardo da Vinci, for 525*l.*; by Tintoret, "Christ Washing the Disciples' Feet," 157*l.*; the Giorgione, for 1,417*l.*; the Mantegna monochrome panels, for 1,785*l.* The Fra Angelicos fetched 1,312*l.*; the Bronzino portrait, 1,837*l.*; the Tintoret portrait, 1,155*l.*; by Titian, "The Artist's Daughter," fetched 735*l.*; by Marcello Venusti, "The Money Changers in the Temple," 1,427*l.*; and by the same painter, the "Adoration of the Magi," 1,210*l.*; the Sansovino drawing, from the collection of Sir Thomas Lawrence, was purchased for 315*l.* The two Buhl *armoires* fetched the enormous sum of 11,500*l.*; the Gothic silver-gilt cup, 405*l.*, the Baron Carl Meyer de Rothschild, of Frankfort, purchasing the "Roemer" cup for the sum of 3,090 guineas, the second cup for 705 guineas. One of the pair of Louis XVI. ormolu candelabra fetched 2,250 guineas; the companion pair, 2,650 guineas.

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pear, indeed, never to wane in interest with the educated public, and any fresh theory with respect to them, instead of being slighted as treating a threadbare subject, on the contrary, readily attracts attention, and a recent speculation of this nature will be noted and examined in the course of the following remarks on the statues of the Apollo of the Belvedere and the Diana of Versailles. The speculation above mentioned is, however, confined to that statue of Apollo, and what he may be supposed to be doing; but a few words may not be out of place in respect to both statues contemplated as a pair, which appears to be an idea with a good foundation.

The birth and parentage of the deities they represent is familiar to every schoolboy who reads his Lempriere. Apollon and Artemis, answering to the Latin names of Apollo and Diana, are spoken of in Greek mythology as having been twins to the supreme Zeus, by Latona, a nymph of primæval mystery. Born at one birth, their advent to life thus points to the belief in the Classic mind that the sun and moon they represent were created at the same time, in accordance with the Mosaic record, the one to rule the day, the other the night. Hebrew thought, however, did not picture them as gods, which it was the character of the Greeks to do, and to personify them, like all the other powers and elements of Nature, under human forms. As the great luminaries of the earth, they entitled them, from their shining qualities, the brother, Phoibos, and the sister, Phoibe.

This "giving light upon the earth" appears to have been, even in the Greek view, the principal mission of the divine pair; and, although Apollo was devoted to music and poetry and the fine arts, and his sister to the chase, and they had also other occupations and diversions, yet, in their most glorious phase, never lost sight of by their true devotees, they were permanently worshipped as the light-giving benefactors of the world, directing their beams to the uttermost parts of the earth, and thus portrayed as divine archers with shafts of radiance.

An article, however, which appeared in the *New Quarterly Review* of April, 1878, denies this sentiment and action to the renowned statue of the Apollo Belvedere. It opposes the usually accepted idea that he was originally represented as he stands now in the Vatican, holding a bow in his left hand, and suggests instead that he held an ægis with a Medusa's head embossed on it. And, to a limited extent, some facts afford an opening for this view. When the discovery of the Apollo took place, in the fifteenth century, it had suffered several mutilations, and among these that of the left hand, which was wanting. This was never found, and the present one, which grasps the centre of a bow as it now appears, was a restoration. The question raised is whether it was a just one. The author of the article in the *New Quarterly* suggests that it was an error.

In preface to his theory he quotes from the fifteenth book of the "Iliad" the charge by Zeus to his son Apollo to give aid to the Trojans in driving back the Greeks to their ships. "Take thou in thy hand the fringed ægis, and shake it mightily, and strike terror among the heroes of the Achaians." This passage is the sole classic authority advanced by the author for Apollo being represented as a bearer of the ægis. The more direct and substantial illustration, however, of this speculation which appears in the article in question, is that in 1860 Dr. Stephens, of St. Petersburg, published an account, with figures, of a bronze statuette he had discovered in the possession of Count Strokanoff, of that city, the ownership of which he had traced back to Dr. Frank, who was physcian to Veli Pacha; and also had ascertained that it was one of eighteen bronzes which had been found in company together, in the neighbourhood of Zanina in Epirus. This statuette is 18 in. in height, not very highly finished, and the *clamys*, instead of hanging over the left arm, as in the Belvedere Apollo, falls straight down behind the shoulder. It is also stated that it is somewhat more robust in its proportions than that statue, and that the left arm is held somewhat lower, so that in these latter respects, at any rate, there does not appear to be any identity between the two works. Nevertheless, with this preamble the essayist proceeds to introduce his speculation by drawing attention to the fact that in the left hand, which is perfect, is held something which is incomplete, but which, although it could not, he says, have been part of a bow, yet might, he states, have formed portion of an ægis, as it appears to be a fragment of something crumpled like a piece of leather; the classic ægis having been originally a goat's skin, on which was displayed eventually the Gorgon's head.

The above statements are the grounds on which the author submits that we should discard from the hand of the Apollo Belvedere the hitherto accepted bow, which is typical, and substitute for it the ægis with the Gorgon's head, which has no such claims, for its adoption in the passage in Homer is at least exceptional.

Were it not apparent that this theory candidly derives its chief authority from the above-mentioned 18-in. bronze statuette from Epirus, which, however, does not now possess the ægis in its hand, but only a fragment of something which might have been one, it might be imagined that the idea of the ægis in the place of the bow had originated from contemplating the fine statue of Perseus, by Canova, which does appropriately hold the head of Medusa in its left hand. This graceful figure resembles the Apollo in its general character and in the position of its outstretched left arm; and that it is especially proper to the hero it represents that he should display the Gorgon's head, is evident from the well-known story of Perseus and Andromeda, so forcibly narrated in the fourth book of Ovid's "Metamorphoses." It is worthy of note, also, that under the first Napoleon, and during the time that the Apollo was, by his order, removed to Paris, this statue of Perseus by Canova, which approaches the Apollo in scale and height, was selected to occupy his vacant niche in the Belvedere Court of the Vatican, from which circumstance, during that time, it bore the name of "*Il Consolatore*."

Notwithstanding this event, which was calculated to have drawn Canova's attention very near to the speculation in question, we do not hear that that great sculptor, who was a devout worshipper of the antique, said anything in that direction. The left hand now on the Apollo was a restoration by a pupil of Michelangelo, who, as is well known, was also an enthusiastic admirer of ancient art. In more modern days the classic and erudite Flaxman thus speaks of the statue,—"The energetic Apollo Alexicacos, or the driver away of evil, is severe in youthful beauty, his golden locks are agitated, the quiver is hanging on his shoulder, and he steps forward in discharge of his arrow."

Great as are these authorities, there can be no desire to oppress with their weight the author of the article in question, for the outcome of such suggestions as his is advantageous, inasmuch as they promote discussion on interesting points of art, and thus are welcome as useful to its cause. Nevertheless it may be submitted that it does not appear likely that the bow in the Apollo's hand will have to give way to the Gorgon's head. What was suited as a glory and as *spolia opima* to Perseus and as an appropriate instrument of vengeance in his hands, to turn his adversaries to stone, might seem indeed almost to entail a loss of dignity to one of the superior gods, who, so much more appropriately, might exert his own especial power, and slay by sunstroke and by his fierce rays, as typified by his fatal arrows. But the question may well be asked,—Why should it be necessary to consider the Apollo, in his noblest statue, as representing in any respect a destroyer?—and why not, on the other hand, a benefactor? Flaxman, by preference entitles him "Alexicacos, a driver away of evil," the god of sunshine, the harbinger of health; and in his youthful and godlike vigour he looks like it! In "Childe Harold," Byron speaks of him as "the lord of the unerring bow," "the god of life and poesy and light," "the sun in human limbs arrayed." This is how this noble work impressed our noble poet, and why should not these eloquent epithets be correct? It seems, indeed, to be a subject for regret on this occasion of the poet's contemplation of the Belvedere Apollo that the Diana of Versailles did not stand beside her brother in the gaze of the bard, as in that case she might have inspired another description equally happy, poetic, and noble.

In both sentiment and execution these two statues have much in common. They are extremely and equally beautiful, and there is nothing savage or malignant or dismal or revengeful in their expression, so that it seems to be beside the mark to entertain for a moment the suggestion that they are represented as in the act of destroying the children of Niobe. That is a cruel classic episode, quite removed from the character in which the divine brother and sister were best worshipped as deities of light and life and beneficence; and not to be accepted in these statues of serene beauty.

In taking leave of the above speculation of substituting the ægis for the bow in the hand of the Apollo, it may be well acknowledged that, after all that may be said in the way of discussion, words are but an inadequate test in such cases, and that it might be submitted to its author that the most practical and efficient way of placing the change he proposes before the artistic world would be for him to procure a cast of the Apollo Belvedere, and afford his guidance to some young sculptor in substituting in the left hand an ægis for the bow. This is not a costly experiment, as even a reduced plaster-cast would illustrate the variation, and the trial might probably be convincing.

As has been already intimated, there is no novelty in the theory that the Apollo of the Belvedere and the Diana of Versailles, which is now in the Louvre, might have been companion figures; for copies of them have been so arranged on several occasions. Various hypotheses have also been set forth as to the modes in which they may have been originally associated as a pair, and of other figures which might have been introduced in their company, but there does not appear to be any ancient authority extant on the subject.

Their resemblance of type and similarity of art-treatment are, however, intrinsic qualities which may be judged of as well now as ever, and in this respect it may be interesting to note in juxtaposition some of the details of this parity as companion figures, for in the action and arrangement of their limbs a correspondence and yet a variety may be readily recognised which renders them perfect as a pair and complete by themselves as a composition. Apollo has just released a shaft from his bow, and Diana is preparing to shoot, and is drawing an arrow from her quiver, which, like her brother, she bears on her back. In the Apollo the right leg is foremost, in the Diana the left. In the Apollo the right arm and hand are the lowest, in the Diana the left. In the Apollo the head is turned towards the left shoulder, in the Diana to the right. They are also, allowing for sex, of corresponding stature, namely, that which is called heroic, Apollo being a little over, and the Diana a little under, 7 ft. Their features possess a strong family likeness, appropriate to their divine consanguinity. And it may be noticed of the Apollo's head at Basle, which is evidently a somewhat free *replica* of his of the Vatican, that the features bear a still greater semblance to those of the Diana of Versailles; also that the treatment of the hair has in that version still more similarity to that of the goddess.

It appears highly probable also, even if not the actual originals from the same hand, that these statues are at least direct copies from such originals. And this is not only evinced by the general coincidence of their characteristics of youthful beauty, in which the form and limbs are compact, long, and slender, exhibiting powers of fleetness and activity, not by any strong markings but by trained and perfect beauty of contour; but that also this similarity of style, allowing for difference of sex, may be followed in a likeness of details which could scarcely come but from one and the same inspiration and hand. In one respect this may be peculiarly evident even to the general observer, namely, in the treatment of the shin-bone, or edge of the *tibia* in the legs. This, although in each case delicately rounded, is made very apparent and distinct, and is a more generic form in these two statues than in most others, with which, however, it may be requisite that they should be compared in this particular to fully appreciate the difference.

The same limbs also offer another remarkable coincidence, namely, a similar departure from exact equality of measurement between the right and left leg: the one thrown back, in either case, being, by measurement, distinctly longer than the forward one, which difference was made doubtless for the purpose of giving greater movement stride and advance to the action of both statues. This, however, is done to a greater degree in the Apollo than in the Diana. It is agreeable to the support of the above idea of these two statues having been designed as a pair that the correspondence of such details as

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these, which are far, however, from being the only ones, should bear out the theory that, as the deities they represent were of one parentage, likewise the statues themselves should have possessed close kindred of birth. It is also satisfactory that this argument does not rest upon hearsay, but that their intrinsic qualities and similarity of treatment are extant in their forms to bear witness. It is on these foundations, open to all to judge of for themselves and to discuss, that the conception of the closest relationship of these two statues as works of art rests; for this is in no degree assisted by their modern history, which is scanty and in a small compass.

The discovery of the Apollo took place towards the end of the fifteenth century among the ruins of Nero's great villa at Antium, now Anzio, on the coast of the Mediterranean, about thirty-five miles from Rome. It was purchased by Julius II. while Cardinal, and when he became pontiff he had it placed in the Belvedere court of the Vatican, where it now stands. Of the discovery of the Diana there is no certain record, but it is supposed to have been brought from Italy to France by Primaticcio, in the reign of Francis I., and placed at Versailles, whence its title, and after a prolonged sojourn there was removed to the Louvre, where it still remains. The present shrines, therefore, of the twin divinities are situated far apart, and they can be brought together as companions solely by means of copies.

It is thus only, however, that they can be contemplated in perfection as associated works which have no superior, and which may well have peculiar interest with us as personifying, in such beautiful human forms, the two great luminaries of the day and night which the Greeks worshipped as gods.

THE STATE OF THE RIVIERA HEALTH RESORTS.

THE outbreak of a typhoid epidemic at Cannes, the presence of scarlet fever at a high-class hotel at Nice, some cases of small-pox among the natives at Hyères, the prevalence of zymotic disease during the summer months among children in the Principality of Monaco, and, above all, the hope that the Queen may again visit the Riviera during the forthcoming winter, have occasioned a decided movement in favour of sanitary reform among the Mediterranean health-resorts. The foreigners have now all left the coast, and this is the moment when public works may be carried forward without interfering with the enjoyment of the visitors, on whose presence the greater part of the inhabitants depend for their livelihood. After the severe warning of the last season, we have the right to expect the realisation of important reforms before the commencement of next autumn. The town of Cannes received a double blow. Not only did it lose an enormous number of its customary visitors, but the Queen would undoubtedly have selected Cannes in preference to Mentone had she not been warned of the danger of typhoid fever. Yet, of all towns on the Riviera, Cannes the least deserved this severe lesson. We gave the details last year of the loan of 120,000*l.* which this town has raised, and how it was to be expended for the most parts on works calculated to improve the health of the inhabitants.* This loan has now been realised, and the cash is lying in the coffers of the Municipality; but, to execute a grand scheme of drainage on which the health of the town in part depends, signatures are required from both the Minister of Public Works and of Marine, and the red-tapism for which France is notorious has occasioned months of delay. Altogether these incidents are most discouraging. The one town which, of all others, has made the greatest sacrifices in the cause of sanitary reform has been the most severely punished. It is true that Cannes is not so well situated as most of its rivals, for the central district is built almost on a level with the sea, and it is only the outlying villas that enjoy positions on elevated ground. So great, however, is the demand for land in the suburbs that the entire neighbourhood is studded with villas, so that now it is almost impossible to manure a field without causing a nuisance to the wealthy visitors who have built their elegant homes amid the olive and orange groves of the coast. Orders were consequently given by the Municipality to cease manuring fields in the Commune of Cannes during the winter season. A tank barge is placed at the head of the pier to receive the contents of cesspools and soil-tubs, which periodically sails out beyond the island of St. Marguerite and empties its contents into the deep sea. Thus the olive trees lose their former supply of manure; but a nuisance is avoided.

Even in this detail, however, Cannes was not exempt from the ill-luck that has pursued the town of late. During the height of the season, the solitary guardian who, in the evening, watches over this tank barge, was taken ill and went home. Thereupon some boys, lounging idly on the pier, were tempted by the sight of the unprotected boat, and, ignoring its true character, clambered on board. Their attention was then attracted by an unfamiliar mechanism, which they soon contrived to set in motion; and this, without knowing what they were about, opened the valve, and let out into the harbour all the sewage which had been stored in the barge. The results are better imagined than described. Several yachts in the harbour at once weighed anchor and took flight in terror. Angry letters were written to the English papers, and yachting clubs were advised to give Cannes a wide berth, as the harbour was poisoned by sewage. The accident of the one night was taken to represent the chronic condition of the port; the existence of the sewage barge was not suspected, and the nuisance attributed to sewers opening into the harbour. Thus the bad reputation acquired by the town of Cannes was accentuated.

The question of the disposal of sewage, becoming every year more urgent as the population increases on the Riviera, is a matter of exceptional difficulty. The native system of drainage is of the simplest. It consists of small wooden tubs, which, when filled with soil, are poised on the back of a mule, one on each side, and carried out to the fields and emptied, probably under an olive-tree. In the better-class houses a cesspool is substituted for the tubs, and, when emptied, the contents could generally be sold for 4 francs the cubic mètre, including carriage to the field or farm. A pipe coming through the wall conveyed into the street or gutter vegetable, kitchen, and all other household water and refuse. The contents, therefore, of the cesspools and tubs were of a valuable and concentrated character. As the number of visitors and winter residents increased, the number of cesspools increased and that of tubs diminished; while, for the open gutter or street drainage, closed sewers were substituted. It is to be doubted whether this change and so-called improvement has always proved to be a real benefit. Most of the Riviera towns now suffer from the disadvantages of both the sewer and cesspool systems. The sewers are generally much too large for the work they have to perform, are rarely flushed, and never ventilated; the deposits are therefore very considerable and very foul. They would be bad enough if, according to the French rule, nothing worse than vegetable water was allowed to enter; but as a matter of fact, there are a number of cesspools which have overflows into the sewers, and this has become all the more necessary where the English visitors, contrary to all French habits, insist on pouring large quantities of water down the closets. While the increased quantity of water in the cesspools has reduced the value of the manure they contain, the thousands of villas yearly built in districts formerly given up solely to agriculture has lessened the demand for manure. The poorer inhabitants, therefore, cannot so readily dispose of their soil-tubs, and, instead of procuring a mule to convey them a long way into the country, they often prefer stealing out in the silent hours of the night, and emptying the entire contents of their tubs into the mouth of the sewer. Where some poorer streets join the main street at Cannes, it has been necessary this winter to keep the police specially posted by the openings contrived to enable the gutter-water to run down in the sewer; but the number of police were insufficient, and, in spite of their watchfulness, the sewers were frequently fouled by the emptying of soil tubs and vases.

These considerations are all of the utmost importance, as no effort is made to sever the connexion between the houses and the sewers. Indeed, the necessity of such precautions is not in the least understood. From the kitchen-sink the lead-pipe goes straight to the sewer; sometimes there is an inoperative bell-trap contrived with a view of preventing stoppages in the pipes rather than the keeping-out of sewer-gas. Then, as there is no independent ventilation of the sewers, the sewer-air must pass through the houses to reach the external atmosphere. Formerly, when there were no sewers, the streets were dirty, but the insides of the houses were free from sewer-gas. Now the houses are like lungs, each room forming a cell, which by its higher altitude and temperature draws the air up from the sewer and expels it again by the window or chimney. Now are the insides of the houses efficiently protected from the emanations of the cesspools. According to the law, which, it must be acknowledged, is very generally carried out, an open pipe must run direct from the cesspool to the top of the house, and is supposed to allow all the noxious gases to escape. But, on the other hand, there is no disconnexion between the closets and the cesspools, no syphon trap under the pan, and the pan rarely contains more than 1 in. deep of water. The pipe is made to descend as straight as possible into the cesspool. It is as wide as possible, to admit the throwing down of brushes, &c., without causing a stoppage, and it is made of porous, thin, ill-conditioned, but very cheap pottery. Under these circumstances, the pipe is always foul, and is in itself a nuisance, independently of the cesspool. Only one thing can be said in its favour, namely, that it is very often conducted outside the walls of the houses. The result is not strictly ornamental, but it is advantageous from a sanitary point of view. The porous nature of the clay used may be judged by the aspect of the chimney-pipes, often made with identically the same pottery, and running up the wall close at hand. These latter are soon coloured through and through by the smoke, like a good meerschaum.

At present the chief concern of the authorities on the Riviera is to prevent the sewer-gas, or rather the bad odours, from ascending into the streets. For this purpose, the openings from the gutter to the sewer are protected by a Barrat valve. This consists of an iron frame-work, where a gallon or two of water can accumulate, then its weight forces a loose valve back, which closes again when the rush of water is over. As there is no syphon beyond, and as the iron flap valve is very often kept partially open by a piece of orange-peel, or some other substance, the apparatus, most fortunately, does not act. It, on the contrary, allows some sewer gas to escape into the streets, which is preferable to its admission within the houses. Also, as these ineffective traps are much nearer to the sewer, and allow the escape of a larger volume of air at a time than would be the case with the house-drains, the nuisance is more generally noticed, and therefore stimulates the outcry and the complaints raised by the visitors. This ultimately affects the authorities, and stirs them to action; though in reality the nuisance, occurring in the open air, is not so dangerous as the less perceptible escape of sewer-gas within the houses. The bad smells in the streets are a useful warning of the danger around; but, as yet, the French authorities have failed to realise that anything short of a pungent stench can in any way be injurious. Therefore, as these odours are necessary to demonstrate the need of taking action, they had better occur in the open streets than within closed dwelling-houses. The more sewer-gas escapes into the streets, the less will remain to enter into the houses.

The houses being, for the most part, utterly without protection from the entrance of sewer-gas, the first and easiest measure would be to ensure the independent and effective ventilation of the sewers, so as to reduce the pressure upon the house-drains, and improve the nature of the air within the sewers. This could be done promptly and without any serious expense. At the same time, every effort should be made to disconnect each house from the sewers, but, excepting a few among the English owners of villas, there is no one capable of taking such precautions. The newly-appointed sanitary inspector at Cannes, with whom we have had lengthy conversations, knows nothing about this phase of the question; and yet Cannes is in this respect the most advanced of the Riviera towns. It is the only town that has established a Sanitary Bureau, and employs a sanitary inspector. The French doctors, engineers, and architects have no knowledge whatsoever of sanitary science in its relation to the drainage of houses, the trapping, ventilating, and dis-

* See *Builder*, April 16, 1881, vol. xl., p. 465, "Proposed Improvements at Cannes."

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connecting of house-drains. It would be impossible to find a Frenchman capable of constructing a water-closet that would answer to the exigencies of modern sanitary science. The education of the country in this respect is still a thing of the future. We must, therefore, not expect or ask for too much at first.

We can, however, at least, insist on the punctual carrying into effect of those few principles and rules that are recognised on the Continent. Thus, where the pail or cesspool system does exist abroad, we can insist that the sewers shall be effectively protected from cesspool overflows and similar contaminations. It would not be too much to demand and expect that the sewers should at once be ventilated, and the gas carried up to a level above that of the houses. Again, we may legitimately expect that the sewers will in future be better constructed, and placed at a sufficient depth to be sheltered from the effect of heat and cold. At Hyères, in the main street, there is a sewer which is only covered by the large flagstones that form the causeway. These stones fitting badly, the sewer is ventilated at every step, a fact which is only too perceptible. Of course the heat dries the material within, accelerates the fermentation, and when rain at last comes the foulest of odours rise to poison the neighbourhood. Last year a little child, living on a ground-floor immediately over the worst part of this sewer, died from diphtheria, after an illness of only three hours! There were several other similar but less virulent cases. We could adduce many other cases of fatal results that might have been prevented even if only the French rules of hygiene had been observed. Pending their suppression in favour of a better system, the cesspools should all be visited, to see that they are all watertight, have no overflows, and that the ventilator is really carried up above the roof. This work is being done at Cannes by the new sanitary inspector, and he has found that, in some houses, the ventilator came to an end under a window; in one case it was the larder-window! Similar inspection should be made in every town in the Riviera. Many startling revelations would ensue. Also, we might suggest that an inlet as well as outlet should be provided for the ventilation of the cesspools. The French rule that every closet should have a window or opening giving on to outer air should also be enforced. We have seen many closets that only ventilate into the staircase of the apartments.

When we consider that English visitors, more than those of any other nationality, have contributed to the success of the Riviera health resorts, we have a distinct right to demand that the local authorities should, at least, do all that the French accepted principles of hygiene proclaim to be necessary. Even thus much has not as yet been done. But we can go further than this. We can urge in the interest of the Riviera towns that nothing would contribute more to their success as health resorts than the adoption of the English ideal, which is fifty or a hundred years ahead of the French conception, and, on the whole, is not more expensive. For this it is indispensable that the municipal councils should despatch delegates to England to study on the spot what is being done. This would be the most conclusive of all demonstrations, and we are surprised that, in defence of their own interests, so easy a measure has not yet been adopted. On our side, while urging forward our English conception with the utmost energy, we must guard ourselves against expecting what is impracticable and altogether beyond the knowledge of the authorities and their recognised advisers, the French doctors, architects, and engineers.

BOULLE, THE CABINETMAKER.

THE very large sums that have been recently realised at the sale of the Hamilton Palace Collection by several specimens of the cabinet-maker's art, and among them a number of pieces of the work commonly known as "Buhl," have, as might be expected, aroused interest in the artistic and industrial world. At a time when our most respected authorities have been striving their utmost to call the attention and admiration of the public to the work of artists of earlier days and their purer and more refined creations, such an event as the sale for thousands of pounds of pieces of furniture belonging to the seventeenth and eighteenth centuries is somewhat calculated to disturb the minds of the less thoughtful public. Of the less thoughtful, we say, because there exist reasons why such sums should be paid for the choice cabinets, the secrétaires, the *commodes*, and the tables, which have recently realised at the Hamilton sale such incredible prices. Putting aside all rigorous standards,—above all, the artist should, in his admiration, be as eclectic as he is the very opposite in his creations,—putting aside, we repeat, all æsthetic standards, how is it possible to deny that these works were produced in the true spirit, however degraded, as we shall be told, the designs and traditions may have been on which artists such as Boulle and Riesener worked? To what monstrosities of so-called industrial art has not the name of the former of these two artists been given? "Buhl" work, as it is erroneously termed by us, has long since, in England at least, received at the hands of our leaders in taste an amount of quiet abuse which, with all but those who do not merely allow themselves to be led by the opinions of others, has banished for ever from the homes of those who respect themselves any creations of the reign of the fourteenth Louis. In France, however, such prejudices are not allowed to influence people of taste, and the memory of Boulle as an artist, a good workman, one of the glories of the *grand siècle*, and as a collector of works of art, is not entirely forgotten, though there, almost as much as with ourselves, his memory has been so associated with the work which is known familiarly by his name, that its connexion with its creator has been overlooked, and *meubles de boule* are spoken of by our neighbours in much the same manner as we on our side, speak of "Buhl work."

The sources of information respecting Boulle are few; the lives of the great artisans of the world are scarcely of the eventful nature that fills biographical dictionaries and the pages of history, and where they have not, like Palissy, left behind them their memoirs, or, like our own Chippendale, published elaborate works on their art, or, like Bréguet the watch-maker, entered the French Academy, we are like to know little of their obscure origin, their early struggles, and their uneventful life-long industry. In the "Biographie Universelle" not a word is to be found concerning the great cabinet-maker of Louis XIV., whose creations crowd the galleries of Versailles. Indeed, were it not for the recent researches of the compilers of the "Archives de l'Art Français," and the by no means common pamphlet by M. Asselineau on Boulle, we should have but few published sources of information on the worthy artist.*

Boulle, it would appear, was born in Paris in 1642, a Protestant, though we have evidence that he died a Roman Catholic. From the contemporary evidence of the Padre Orlandi,—in his "Abecedario,"—it would seem that young Boulle early showed his artistic tastes, desiring even to become a painter, and only departed from this course at the express wish of his father, who looked to him to continue his profession as cabinet-maker. It is easy to see how greatly this early influence affected the young man's after-life and revealed itself in the less-thought-of productions of his genius. We have probably little cause to regret his forced step. As a painter we know very well what he would have been under the over-towering contemporary influence of Lebrun. Respecting the early years of Boulle's life we know nothing; in all probability they were passed in the long and industrious appenticeship which was considered necessary in the past to make the good workman. But that the young man must early have shown his power is evident from the fact that at thirty he was already famous. His *brévêt de logement*, which gave him, at the king's hand, a permanent lodging in the royal palace of the Louvre, is dated 1672, and is, we see by the document, accorded him for his "experience" as an *ébéniste, faiseur de marqueterie, doreur et ciseleur.*"

There is a story, one which would go far to show the instructive value of museums and works of art with the student, that on the Sundays, when the great galleries were open (we recommend this incident to all interested in the views of the Sunday Society) young Boulle used to visit the palaces of the Louvre, Saint Germain and Marly, and return with his mind full of what were termed the wildest fancies. One day, the story goes, his master took him to Versailles to execute repairs, which occupied some little time; the effect of the visit and the sight of the marvels which "the grand monarch" had called into being on the great sandy plain of Versailles, appears to have operated a positive effect on the impressionable mind of young Boulle, and on his return his imagination was actively employed in the design of pieces of furniture suitable to adorn rooms such as he had seen in the king's palace. A royal competition,—for competitions date from before our time,—gave the young man the opportunity of manifesting his skill, and, through the influence of the king's favourite, Mdlle. de Fontanges,—nor does favouritism belong exclusively to our days,—Boulle found his designs accepted; *carte blanche* was given him to carry cut his conceptions, and the enchanted monarch who found in the young artisan a worthy decorator of the magnificences which Lebrun and Mansard had created, accorded him for his life-time his protection and patronage. The apprentice had at length realised his dream: he had stepped from the narrow sphere in which he had so long regretfully vegetated, and the glory he had so long sighed for had come.

The numerous commissions which from this time crowded in upon Boulle he appears to have found himself incapable of carrying out. Letters in existence show the sad complaints of the Dauphin,—the son of Louis XIV.,—respecting the delay in sending home a certain cabinet, a marvel of design in mirrors and marquetry; while Crozat, the wealthy banker, we find, even brought an action against the artist for his neglect in complying with his instructions. The liberality of the king was great, and it is at first sight difficult to understand how it was that throughout his life Boulle appears to have been constantly troubled with pecuniary difficulties. The truth is, there still remained in him the soul of the painter he in his youth had aspired to become, and Boulle, we find, was what is understood as a collector, a collector who never missed a single sale of rare prints and drawings; raising money in every direction to satisfy his passion, and finally being almost broken-hearted by the destruction by fire of the greater part of his treasured gatherings, which, from all accounts, would appear to have been one of the most interesting and complete then in existence. His losses, indeed, he estimated at over 15,000*l.*,—a very large sum for two hundred years ago. The sale of the remains of the collection, which took place at his death, occupied many days.

Boulle died at the age of eighty-two (Feb. 29, 1732) at his home in the Louvre, and was buried in the neighbouring church of Saint Germain l'Auxerrois, leaving two sons to continue, only in name it is true, the traditions which he had in a measure positively created. One of the sons, employed at the Sèvres manufactory, was, it would appear, the first to introduce, in the decoration of furniture, the use of porcelain.

The secrets of Boulle's skill may be said to have died with their inventor, for though the traditions were continued, the sobriety and the grandiose style of the master will be found to be sadly wanting in all the work of his imitators. So much was this recognised that, throughout the last century, in all the sale catalogues the works by Boulle himself are conspicuously marked, and more than one collector made it his speciality to gather specimens of the great cabinet-maker's work. The finest of his creations were, of course, made for his royal patrons, and more than one piece in the terrible years of the Revolution was to pass into this country; thus several of the specimens of Boulle work in the Hamilton Palace collection have originally come from the palaces and châteaux of the French kings. That the sums which already several of these pieces have realised are not the result of mere caprice may be judged when it is remembered that in the last century specimens of Boulle work invariably fetched almost equally large sums.*

It is only when one has had the opportunity of seeing and studying a fine specimen of genuine Boulle work, that the superiority of the original to the imitations which bear his name, can be thoroughly appreciated. There is a sobriety of tone and treatment, of line and proportion, a grandeur of style, a balance of light and shade, of dark and light, of bright and dull, of brass and white-metal (pewter), of

* "André Boulle, Ébéniste de Louis XIV." By C. Asselineau. Paris, 1872; 44 pp. Seventy-six copies only were printed. One will be found in the library of the South Kensington Museum.

* Boulle is known to have made for the banker Bernard a writing-table at the cost of 50,000 francs (2,000*l.*), but in the Revolution this *chef d'œuvre* is believed to have either been destroyed or gone astray.

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tortoiseshell and lacquer,* which will be found to be absent from the work of his successors and imitators, and utterly wanting in the coarse crude abortions which have been at all times forced on the public attention under the deceptive title of "Buhl work." Even in the most conscientious of his successors, such cabinet-makers as Crescent and Caffieri,—who lived in the time of the Regent, contemporary with our Queen Anne,—the prevailing Rococo taste it is easy to see overcoming what little classical severity was left in the seventeenth-century work of Boulle, who largely drew his inspirations from the architectural models that he made his constant study. When we add to his merit as a designer and a delicate appreciator of the work of others, his merit as a good workman whose productions, without need of repair, are as stout in the present day, after two hundred years of use as they were the day they were made, it may be fairly conceded, even by the sternest rigorist, that André Boulle worked in what is understood as the true spirit. Not only in its construction, but in every feature, in the choice of the materials, in the chasing and gilding and the marquetry, his work will be found to be of the honestest, very different to the modern rubbish that passes under his name, where false tortoiseshell, made of horn or gelatine; false mother-o'-pearl, box or horn instead of ivory; brass or even zinc lacquered ornament tacked on to ill-made joinery usurp the place of true work, whose only fault was that it was produced in a period when the traditions of art were on the decline. When Boulle used wood it was ebony, which the cabinet-makers, his successors, on the plea of its difficulty in working, in taking the glue or the varnish,—Boulle never used varnish,—and other reasons, replaced with stained pear-wood. In the choice of his woods Boulle showed the extremest care, and one of his severest blows was his loss by the fire that destroyed his collection of prints, of a quantity of rare woods which he had, we learn from the inventory he made at the time, long stored by to season. The bronze he used was honestly chiselled and chased and gilt, not lacquered, and each ornament was a design not stamped out.

It is somewhat sad, and calculated to rouse reflection, the difference between the spirit in which Boulle produced his work and that in which his successors now produce theirs,—the relative position of the so-called industrial arts in the present day compared with those even of his time 200 years ago. The workman in the past was an artist. Boulle, not to mention many others of an earlier period, was an artist: he conceived his own designs, he drew them out (his patent is given him in his name not only as a cabinet-maker, but as an architect and sculptor), he executed everything with his own hand,—he was a chaser, engraver, and gilder; he was, as we see, a man of cultivated tastes into the bargain.

The division of labour, with its inevitable result of work without intelligence, without good faith, has made the modern workman what he is generally called,—a mere machine; he is in reality only a cog-wheel of a machine. Talent cannot be said to be wanting, nor the inducement which capital and reward are supposed to afford. If Boulle himself were to return, we strongly suspect he would have no opportunity to show his power. In the first place, he would find it impossible to devote the time to his work that he required two centuries ago to elaborate his creations. Hasty production, with a view to the hasty acquiring of fortunes,—to rival, apparently, other competitors who in their branches have acquired equally hastily gotten gains,—would thwart the best endeavours of the artist who would try to work in the traditions which regulated the industrial productions of the past. Are we calmly to state that what may be called the secondary arts are doomed? Let us hope not; but they are in danger.

Epping Forest.—The cost of reclaiming Epping Forest, including arbitration, compensation, and other legal expenses incurred by the Corporation, will, we are told by the *City Press*, approach the sum of 270,000*l.*

* It may be remarked that the presence of lacquer panels in Boulle work must be looked on with some suspicion; it has long been usual to replace by such panels the injured work of an original. When Boulle used Oriental lacquer, which he occasionally did, its quality was invariably of the very finest.

A PROPOSED LABOUR EXCHANGE.

A PROPOSAL has recently been submitted to the French Chamber and the Paris Municipal Council, which, though it is not likely to receive immediate attention, is none the less highly suggestive of matter for consideration, as much here as on the other side of the Channel. The proposal is no other than a suggestion that the Paris Municipal Council should erect and endow a Labour Exchange (*bourse de travail*), which might, to the industrial classes, to employers and employed, afford the same facilities for obtaining professional information and mutual advantage as the Bourse or Stock Exchange affords to the very large section of commercial men who deal or speculate in stocks and shares.

The suggestion, though it cannot exactly be said to be novel, is none the less likely to attract considerable attention among all interested by the proposal. Though there are, it will at once be seen, many objections to the mode in which it is so far proposed that the institution shall be started, the suggestion will probably produce its effect, and private initiative may perhaps do what it is at present proposed should be undertaken by the State.

It is one of the features of modern commercial activity, with its railways, its steamships, its mines, and what not, and the concentration of the considerable amount of capital this activity necessitates, that the market of those two great agents of production, capital and labour, has been singularly enlarged. Where formerly capital was invested in little but local ventures, we now see it spread over the whole world. English, French, Belgian capital is put out, not only in the countries of Europe, but in the United States, in Egypt, India, and Australia. The Suez Canal has now for some years been pierced, and the Panama Canal will soon be opened to the commerce of the world. Ventures of every kind are risked, and it is by millions that the profits on the invested capital can be reckoned. The other factor, labour, is, however, less mobile by nature. It is barely a century since Adam Smith remarked that man, of all commodities, is the most difficult to transport. However, as the means of communication have been facilitated, workmen, like the capitalists, have also set out in search of more advantageous markets. Emigration in its true sense is daily increasing. Last year hard on a million souls poured from Europe into North America, and there is every probability that the number will be increased this year. We have heard of 2,000 emigrants and more arriving in a day at New York. These, let it be noted, are not solely recruited among the agricultural classes, but also largely from among the industrial. The American workmen are, indeed, commencing to be alarmed at the threatened competition, and are asking if, now that they have shut out the Chinese, they shall not adopt the same process with the Europeans. What may be called the labour market is increasing in size every day in spite of the strong ties which attach us all to our native soil; in spite of the difference of climate, habits, and language; in spite, also, of the absence of any guiding trustworthy information. It is in this respect that the artisan may fairly be said to be in an inferior position to the merchant, who, through his exchange, may have at his disposition all that mass of information which the telegraph is able to distribute daily to every portion of the globe, and by means of which the capitalist is enabled to invest his funds wherever he sees the demand is greatest and the probable profit the largest. Unlike the merchant, the workman knows little beyond the price of wages in his own locality; he has no trustworthy means of acquiring any information as to the rate of wages in other places, or if so, his information is nothing more than hearsay, destined, perhaps, by sad experience, to be proved incorrect.

By a recent article on this question of the labour exchange, published by M. Molinari, in the pages of our esteemed contemporary, the *Journal des Débats*, we are reminded that the attempt has before now been tried to institute labour exchanges in the principal centres of industry, and special newspapers have been started, notably in Belgium and Germany, with a view to informing the working classes respecting the state of wages in the different markets of the world; but these attempts have all failed in face of the marked hostility on one side of the employers, on the other through the indifference of the men.

Although the multiplication of cheap and rapid means of communication has largely tended to level the inequalities which formerly existed in the price of wages and the necessities of life, even in places not distantly removed from each other, these inequalities have not entirely disappeared, and employers in localities where wages are low, the workmen in those where they are high, fear equally that any publicity might change so respectively an advantageous state of affairs. Some thirty and more years ago a journal, it would appear, was started in Paris which undertook to make known to its readers the rate of wages in Paris, and which endeavoured to obtain and retail the information gathered from various sources, but the task was one, from the outset, of extreme difficulty. The workmen consulted did not conceal their fear of bringing by this means to the capital a crowd of competitors, while with others imbued with political notions the step was unwelcome.

We only know, remarks our contemporary, one journal,—the *Labour News* of London,—which, as its title indicates, has made a feature of informing its readers of the state of the market, though it may be noticed it is only the market in America, the journal being little but a well-organised advertising medium of the trans-Atlantic emigration agents. The Trade Unions which reckon their members by thousands actively look after their interests. They are, indeed, as is well known, organised almost entirely with this view, keeping themselves well posted up in all matters relating to the demands of labour in different parts of the country. But these great associations are, unfortunately, it must be admitted, strongly imbued with a narrow spirit of monopoly, and they fear above all any immigration of foreign workmen into England, where, whatever the protectionists abroad may say, wages are higher and the day's work shorter than on the Continent. The Trade Unions keep alone for themselves the information they gather, and abstain from making known in any way to the outside public anything that would tend to lower English wages to the level of Continental wages.

In spite of the small degree of welcome with which the proposal has so far been met, the suggestion to free from any monopoly, and lay before those interested all information that can be gathered respecting the state of the labour market in every portion of the world, has not been abandoned. In 1851 it was suggested,—we continue to quote our Parisian contemporary,—by M. Ducaux, the Prefect of Police, to establish under Government direction a Labour Exchange, but the proposal was rejected on the score that the State could not safely interfere with such questions. In 1875 M. Delattre laid before the French Chamber an analogous project, but revised and largely augmented; the proposal was submitted to a commission entrusted with an inquiry into the question of the participation of workmen as investors in contracts for the public works. The Bill now laid before the Paris Municipal Council, suggests the erection in the centre of the city of a large building of iron, brick, and glass, to contain a central hall where the workmen may congregate, five principal committee-rooms for the general meetings of the trades committees, and five large offices for the *employés*. The first and second stories to contain in all some eighty rooms for the offices of the various trades committees. The total expense, including some 300,000*l.* for the expropriation of the land, would come to hard on half a million. The staff of officials would consist of a secretary, five subordinates, and about twenty or more clerks. The duties of this body of officials would be to receive and duly register all demands and offers of employment, to prepare at the end of the week a table of wages in each trade, the table being posted in the general hall. In short, nothing more or less than a species of gigantic registry office.

It does not appear from what has been stated above that the project is to be attempted on a small or economical scale. The report, indeed, remarks that perhaps temporary quarters might at first be found for the meeting of the trades committees, and that certain journals might weekly publish the tariff of wages.

There exist many reasons why this proposal is scarcely likely to receive immediate attention. In the first place, the chief objection, as we have so reported the scheme, lies in the intention of placing it under municipal authority. The Parisian ratepayers would justly have cause to

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complain of the large share they would be called upon to pay for the erection and maintenance of so costly an institution. A second objection may be mentioned in the avowed unwillingness that would be sure to be met with on the part of the various trades committees to make known to the world the tariff of their wages. Like so many philanthropic measures, this suggestion of a labour exchange will be found to be beset with obstacles only the more difficult to overcome as they are supported by the most powerful of all motives, those connected with personal and pecuniary interests.

That there should seem to be an opening for such an institution we can well understand, but it will not be till the need is absolutely and widely felt that we may expect to see it satisfied. There is probably no valid reason why such an institution should not be started by private initiative. Indeed, in our country, it is alone private initiative which would attempt such an undertaking; we believe in the possible success that might encourage the promoters of such a scheme.

As bearing on an interesting phase of the labour market we have laid the subject before our readers, concluding as we commenced, by saying that the proposition is suggestive of thought.

THE DOGE'S PALACE AND ITS ART WORKMANSHIP.

IT is interesting to notice the many evidences we find, in all old countries, of the power and skill both needed, and always found to have been forthcoming, in the planning and erection in detail of buildings destined for monumental or sacred purposes, and which, when completed, call on us to look at them, and, may be, to read on their walls and in their details their special purport. None will dispute this who have for any time looked at and studied the great fanes and monuments of antique art. How much, therefore, must it be deplored when anything occurs to lessen this interest, or even to change in any way the special character of it. A large and impressive building, such as the Palace of the Venetian Doges, belongs to history, and is, indeed, a visible page of it, written on at the time, and by those whose wants and aspirations called it into existence, and the more veritably the impress of the artist and executive power of the hands and minds of those of the past has been made, the more precious and fuller of art value is it, and the more worthy of all due preservation and careful keeping. Looking thus at these evidences of original art-thought and executive skill, as seen in this world-famous palace, the theme of so much song and so many day-dreamings, there may yet be not a few lessons got out of it by those who nowadays do the like work, but in so widely different a way.

We name this Venetian palace not alone from the interest now felt in so famous a building, but from the fact of its displaying so many evidences of the power of hand of the workman, and as evidencing what the artist-workman can do in the building-up and completion of a fine and characteristic structure. He can, as here seen, leave the indelible impress of his hand on it; and it is this which leads us to say a word, —may be, in season,—on the subject of the power of the workman in art, and on what in the past has been done by him all the wide world over, when he,—the actual workman,—has been left to himself, thus to add, as an individual power, to the art-architecture of it. This, indeed, is to be seen everywhere, but nowhere with more convincing effect than in the details of the world-famous building we have cited. It would seem at first glance to be an old subject to dwell upon, and so it indeed is; but it is ever new nowadays, if we but look at the different ways of work of our present race of workmen,—art-workmen,—and those of the past: of those, for instance, who worked out the details of the Greek Parthenon, or of those who worked out the details of the Romanesque and the Gothic of later days. In no structure that remains to us does this evidence of the "workman's" power more strike us than in and on this very building. We would urge those who are interested to study the evidences of it, in plaster, now at South Kensington and the Architectural Museum, and in Mr. Ruskin's Sheffield Museum.

We thus cite this art, and fine art, of the Doge's Palace, by way of useful illustration, not because it is the sole one, but from the certainty that none will for a moment dispute its cogency. It was the same with what is termed the Romanesque everywhere, and the early Gothic from its first beginnings to its passing away into another style or phase of Gothic. All goes but to show how entirely different were the ways of work in those distant days to any which now-a-days prevail. In them, as in other more remote times before them, the workman was, without doubt, an artist,—a power, however rude and even near-sighted he might have been. He must needs have been an artist, and, so far, a thinker, and one capable of being left to himself, and thus to be guided by his own notions of the fitnesses of things. It is impossible to account else for the fine stone-cutting to be found in so many of our cathedrals and churches, and to note in it, in the absence always of recutting and of what is called "restoration," the power and individuality of the handwork, as also the life in the quaint animal forms, and in the leaf and flower cutting, however "conventional" the work may be. It is well to make note of this, and may be to speculate on the difference between this work, and method of work, done in so distant a day, and that of our own of to-day. We have before us in our museums fragments of such work from Venice and other cities, and they read, and can read, but one lesson: that the first conception, and drawing and final carving of the animal and the forms imitated or rendered conventionally could not have been from a previous design on paper, and certainly could not have been done from a drawing by another hand. Such work must needs have been the original thought of the art-workman himself, and have been drawn, however roughly, on the stone slab or block; and finally the work itself must have been the intelligent handiwork of the artist workman, without the aid or help of others; indeed, the workman's thought realised by himself. Such a work and so executed is as much a work of art as is the weed drawing in one of Turner's Liber Studiorum etchings the veritable work of the artist's draughtsman. We see, it is true, but very little of this about us, only here and there by accident. We would point again, for it is instructive to make note of it, to the very fine and original carving of the "grotesques" at the base of the Monument on Fish-street-hill. These are finely imagined and sculptured, and are worthy of all study. They were the work of one Edward Pierce, and were doubtless suggested by Wren, the architect of the Monument, but designed and worked out entirely by the artist sculptor himself. We would, here, too, point, in passing, to some capital fruit and leaf carving on the panels of a new house in Chancery-lane, as an encouraging sign of better things.

We may thus cite this work of the Doge's Palace as evidence of the power of the art-workman in thus leaving his impress of art skill and power of hand on a building. It is a subject that some may think of easy understanding, and all but obvious, but in reality it is not so; for the difference mainly between the past and the present of art, and certainly of architecture, in its details, depends on it. It was common to art and architecture all the wide world over, and the very absence of all machine and mechanical power in fine art then, luckily for us, prevented anything like our present art action from being in any way possible. It was this, indeed,—shortcoming, if you will,—that in reality made the old art what it was, the expression of the individuality, and, as well, of the executive power of the workmen of past days, and which, indeed, makes the work which they have left us so impossible to imitate or reproduce. It may, indeed, be for us, working as we do, and perhaps for the present must needs do, impossible to fully realise this ancient method of working out a design, but that it was so no art-student will for a moment doubt who will be at the pains to study and thoroughly look at, again and again, what has been left to us of the past of art, whether from old Greece of heathen days, or from Venice of more modern and Christian times.

How deplorable this is, no one, we are sure, who at all cares about such matters can be told without a profound feeling of regret. Once gone, the hand impress and the feeling of the artist-workman or workmen who worked out the details of this Venetian palace are beyond recal; there is no possible way of getting them back again, and the building which they illustrate and beautify must needs become, by such process, a quite new one, though on the old lines. This work has been, it would seem, but talked over, and we can but hope that it will not be persevered with, when it is considered what must be really the result of it,—the blotting out of the past of art work, so different from the present, and the putting of modern work in the place of it. We may here, perhaps, remind those who feel interested that there are some fine casts in plaster of details from these very doomed capitals in the Architectural Museum, Westminster. They were taken under the thoughtful care and guidance of Mr. Ruskin. With other fragments equally fine they may in the future be all that veritably remains of the old palace of the Venetian Doges, by the side, perhaps, of a faded photograph or a sketch taken by some passing traveller. *Sic transit*, we may, indeed, here, if anywhere, say.

STARTING FORCE ON TRAMWAYS.

OUR correspondent, Mr. Lefevre, C.E. (vol. xlii., p. 752), in remarking that it may surprise us to hear of the verification in fact of a suggestion made in our columns, calls forth the remark that, although we were unaware of the existence of the particular accumulator which he describes, the coincidence is by no means unique. To the engineer, as to the architect, the imaginative faculty is essential, if at least he would rise to the higher duties of his profession. But there is this difference between the two orders of workmen, although each is, or ought to be, truly a ποιήτης. The demands on the imagination of the latter are ordinarily of a more special character; and in the case of the former, more widespread or universal. Thus, the question of the costliness of starting a tram-car by reason of the injury done to the horse, must have been more or less present to the minds of all mechanical men interested in tramways for some considerable time. This fact must have given rise to a general demand on the inventive faculty which, according to the usual course of invention, is likely to have set several minds independently to work. And, as the problem is the same in each case, it would be by no means surprising if the same solution were independently arrived at by different inventors.

For ourselves, we do not claim to have gone a step beyond the stage of detecting what was most needed, and indicating the need to those whose habits of thought and of occupation rendered them the fittest persons to attack the practical problem. To a certain extent this has been already done by Mr. H. P. Holt, whose tram-car starting-gear was patented on the 13th of May, 1879. The apparatus is figured in the supplementary volume of Mr. D. K. Clark's work on Tramways (p. 177). Mr. Holt claims that by the use of this gear, with its cam quadrant, the force exerted in starting a tram-car of 5 tons is reduced from 470 lb. to 213 lb. on a level, or from 1,400 lb. to 636 lb. on an incline of 1 in 12. This is a material gain, and would bring the strain on the horses on starting down to something like that on an ordinary road. Our own notion, in referring to the probable use of an accumulator, pointed, we may say, to an electric accumulator. But the possibility of a mechanical accumulator, or, in fact, a powerful spring, to act as a brake in stopping, and as a lever for starting, was also before our consideration. Mr. Lefevre suggests an hydraulic accumulator. Of the admirable service which such an application may render there can be little doubt. The main question, perhaps, may be as to the weight of the apparatus. Two hundredweight for a car of five tons is an addition of only two per cent. to the weight of the car; and it is quite possible that this may prove difficult to beat. We call attention to the subject with pleasure, not only in the interest of the inventor and of the shareholders, but even more in behalf of our dumb and deserving clients,—the tramway horses.

Great Bealings Church, Suffolk.—A new reredos has recently been put up in this church as a memorial of the late Lord Hatherley. It is of Bath stone, divided into three compartments, with alabaster shafts and carved canopies, from designs prepared by Mr. Wm. Bassett Smith, of 10, John-street, Adelphi, and executed by Messrs. Cornish & Gaymer, of North Walsham, Norfolk.

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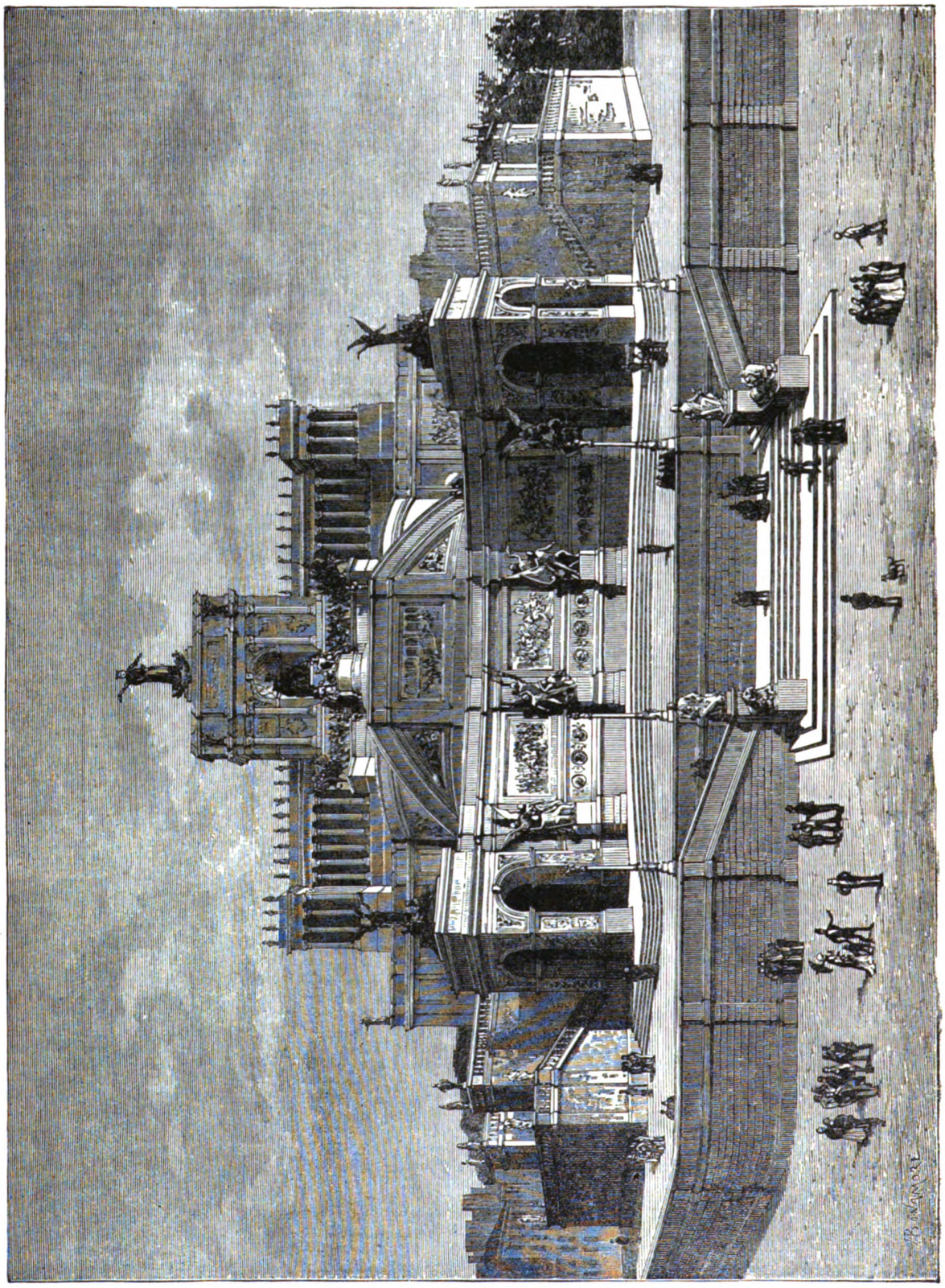

DESIGN FOR THE VICTOR EMMANUEL MONUMENT, ROME: SECOND PREMIUM.—BY SIGNORI FERRARI & PIACENTINI.

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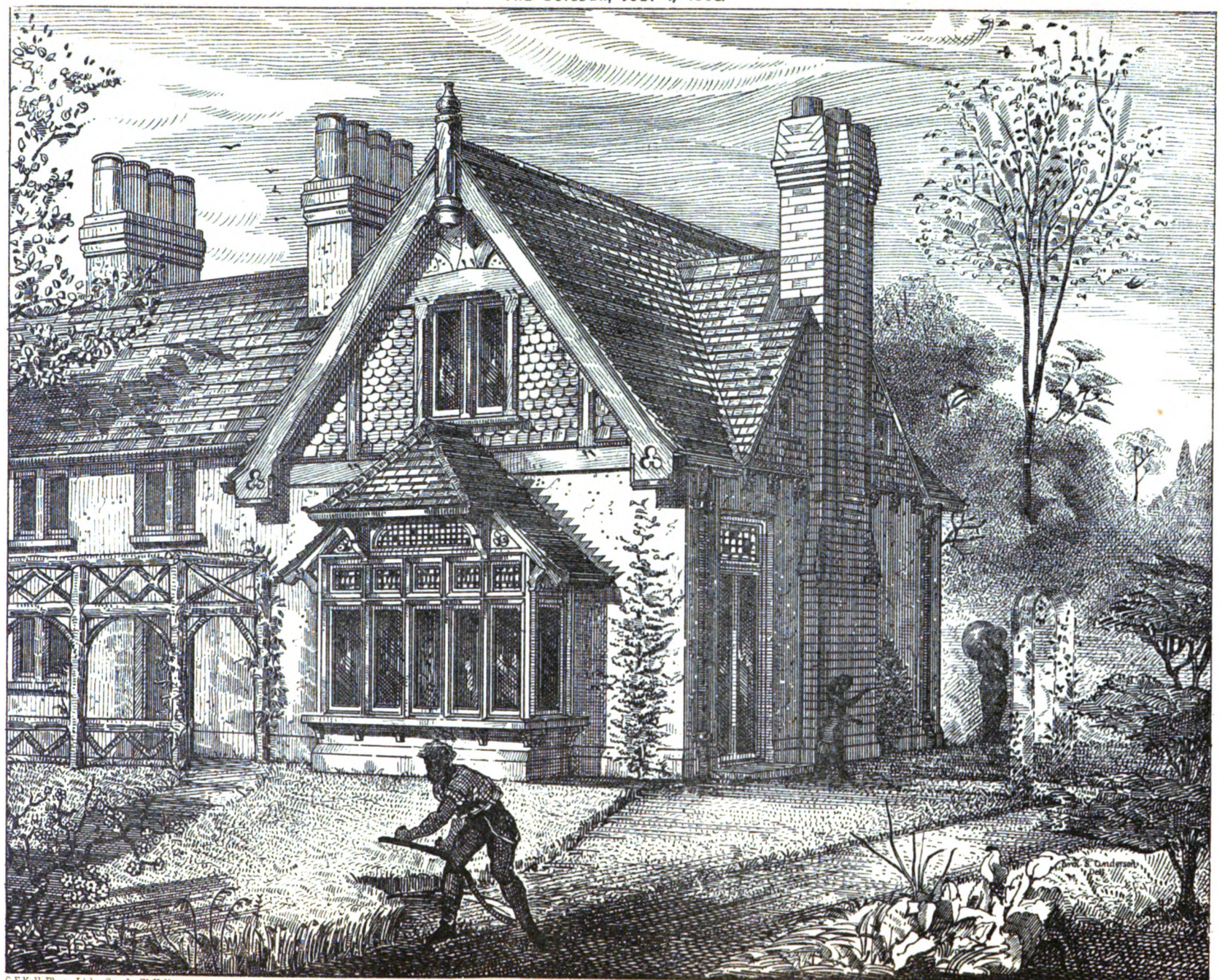

C.F.Kell, Photo-Litho. Castle St Holborn.

PARFETT COTTAGE, EVERSLEY, HANTS.—MR. W. HEWSON LEES, ARCHITECT.

Wyman & Sons, Printers, Gt Queen St

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DESIGN FOR THE VICTOR EMMANUEL MONUM

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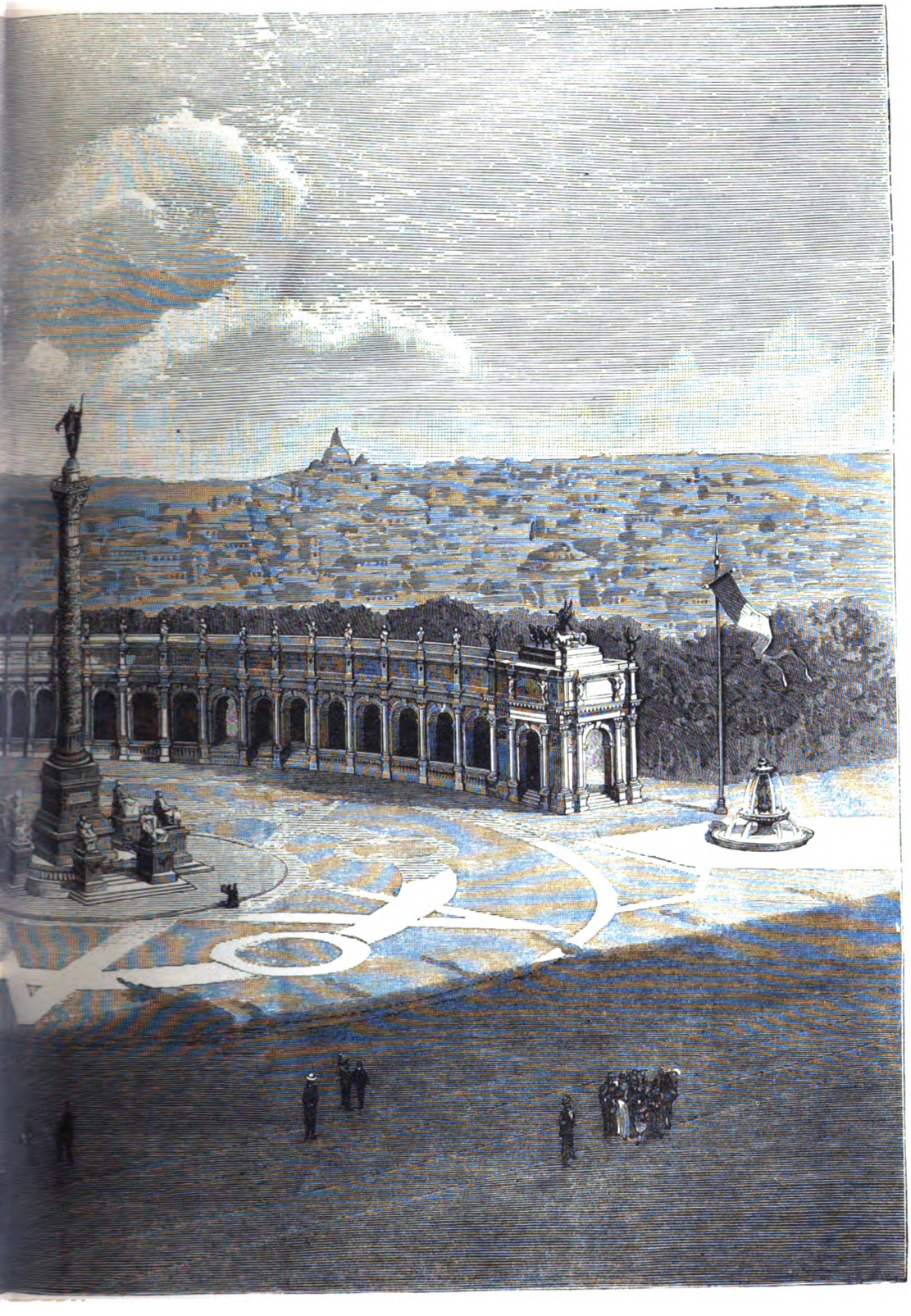

ME: FIRST PREMIUM.—By M. Nenot, Architect.

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Waterman & Bass, Photo-Litho

Wyman & Sons, Printers.

THE VILLIERS BAND STAND, WOLVERHAMPTON PUBLIC PARK.

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DESIGN FOR THE VICTOR EMMANUEL MONUMENT, ROME: THIRD PREMIUM.—BY SIGNOR STEFANO GALLETTI.

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THE INTERNATIONAL COMPETITIO FOR THE VICTOR EMMANUEL MONUMENT.

ALTHOUGH, as we stated in our issue of April 8th, 1882, when we reviewed the principal drawings and models submitted, between 200 and 300 were sent in by Italian and foreign architects and sculptors in the international competition for the national monument to be erected in honour of Victor Emmanuel in Rome, not one of them, it seems, has been selected for execution by the commission appointed to decide upon them. A great many of the plans exceeded the estimate fixed by the Italian Parliament (10,000,000 lire = 400,000*l.*), some to a ludicrous extent, one of the designs involving an expenditure of 100,000,000 lire. Others were considered not to meet the requirements of such a monument. But as the programme of the competition prescribed premiums to be given for three of the most meritorious designs, the judges have made three awards.

The first premium has been carried off, as already mentioned, by a young French architect, M. Henri Nenot, who has not yet reached his twenty-ninth year, and who gave early promise of distinction. Having made a journey in 1880 to Delos, Smyrna, Bairout, Baalbeck, Damascus, Jerusalem, and Jaffa, passing thence to Egypt, and ascending the Nile, for the purpose of studying Classic art, he on his return entered the list of competitors for the Victor Emmanuel monument. Full of the impressions gained during his journey, he evolved the design which has been awarded the first prize of 50,000 lire. His work resembles the Piazza del Plebiscito of Naples, and would be a second Piazza di San Pietro, but chaster in style, more in accordance with the rules of Classic art, and somewhat smaller. He proposes it to be placed in the Piazzi di Termini, Rome. It is of semicircular form, a triumphal arch occupying the centre, and facing this is placed an obelisk, a modified form of Trajan's Column in the Place Vendôme, Paris. Sculpture plays an important part in M. Nenot's design, fifty-one statues being distributed over the semicircle and the triumphal arch; four triumphal cars, in the form of the bigas of the Roman circus, surmount the arch and the ends of the arcade respectively. The column in the centre bears the figure of Victor Emmanuel in modern dress, its base being surrounded by eight statues. Four fountains complete the decoration of the monument. The column is covered with bas-reliefs, winding spirally round it, and representing scenes from the Italian wars of independence. The design of M. Nenot admits of an alternative: an equestrian statue of Victor Emmanuel may take the place of the triumphal column if the judges should deem fit to substitute it. The wall spaces of the portico of the arcades are to be filled with reliefs.

The second premium of 30,000 lire has been given to Signori Ferrari and Piacentini, two Roman artists. Their united design is not easy of description, but it is a pile of grand proportions, which its authors desired to see placed in the Capitol. It is a mass of staircases, platforms, parapets, the whole surmounted by a triumphal arch, in a niche of which is placed the sitting figure of Victor Emmanuel. At his feet and round him are grouped bas-reliefs, flanked by equestrian groups, that to the left being Garibaldi, that to the right an army general, alluding to the double means by which, under the auspices of her first king, Italy achieved her unity. The base, and indeed all available wall spaces, are filled with reliefs, the whole being adorned by colossal statuesque groups and single figures.

The third premium, of 20,000 lire, has been given to an Italian sculptor, Signor Stefano Galletti. His design consists of a triumphal column for the Piazza Venezia, and is in keeping with its surroundings, the old palace of the embassy of the Republic of Venice. It is profusely adorned with bas-reliefs, and its base is surrounded by equestrian figures and guarded by lions. The statue of the first king of Italy, on horseback, crowns the summit.

We give engravings of the premiated designs in this week's *Builder*. The decision of the commission has given rise to much hostile comment in Italy.

PARFETT COTTAGE, EVERSLEY, HANTS

THE addition to this house consists in a new dining-room, with bed-rooms over, the treatment of which was attended with some difficulty on account of the very dwarfed height and unpretentious appearance of the old building. The new room being 22 ft. by 18 ft., it was desirable to make it fairly lofty, whilst, on the other hand, care had to be taken not to utterly crush the old portions by the height of the addition.

The lower portion of the work is executed in cement concrete, and the upper parts are filled in with tile hanging. The ceiling of the dining-room, to get as much light as possible, is formed as a panelled ceiling.

The works have been executed by Messrs. Harmsworth and Bunch, builders, of Eversley and Yately, under the superintendence of the architect, Mr. W. Hewson Lees, of Doughty-street, London.

THE VILLIERS BAND STAND: WOLVERHAMPTON PUBLIC PARK.

THE Right Hon. C. P. Villiers has presented to the people of Wolverhampton a handsome band-stand, which is erected in the public park, and was inaugurated with considerable demonstrations on Whit-Monday. We give a view of it. The structure occupies a position on an elevated part of the park, on the western side below the Connaught-road gate, whence are obtainable the best views of the surrounding scenery, embracing Tettenham ridge and the park itself, situated like a verdant amphitheatre within its encircling border of town buildings and suburban residences. Placed on a site formerly covered with grass, a good deal of work has been needed in the immediate locality of the stand to fit it for the promenade of visitors. Round the base of the stand is a grass border some 9 ft. wide, relieved with ornamental beds planted with trees and flowers, and enclosed by a neat ring fence of wire. Outside this is a circular gravelled walk 30 ft. in width, with five other walks, each 20 ft. wide, radiating therefrom to the main roads in the park. The turf has been taken up and relaid upon improved levels to correspond with the walks, and altogether the remodelling of this, the most picturesque part of the whole enclosure, has been well conceived and executed. The band stand has been erected at a cost of 340*l.*, of which sum the ironwork represents 225*l.*, the stonework and flooring 78*l.*, and the painting 37*l.* The canopy, like the stand, is of cast-iron, and octagonal on plan. It is domed-shaped in elevation, the profile, or outline, being to the curve known as the ogee. The framework on which the covering plates are fixed consists of eight cast-iron ribs, each springing from a column, and joined together at the top to the strong cast-iron base plate of terminal. Between each pair of ribs, and attached thereto by bolts and nuts, are four angle-iron purlins. Each of the cast-iron roof-covering plates is securely fastened to the ribs and purlins, and the roof is surmounted by an ornamental cast-iron weather-vane. The whole rests on eight strong ornamental cast-iron columns 16 ft. high, each column having three ornamental spandrel brackets attached, two of which are set at the angle answering to the shape of the stand, and, with the corresponding bracket on the next column, form an arch, enriched and made secure by having an ornamental fret panel of the full length of the bay fixed at the top. The third bracket projects out from the stand in a line with the main rib, and supports the overhanging roof and eaves. A ceiling of varnished pitch-pine is fixed immediately above the line of the top of the columns which acts as a sounding board. An ornamental railing, 3 ft. 9 in. high, fixed to each of the columns, encloses the structure, and on one side a double-leaved gate is hung to plain wrought-iron standards. The total height to the top of the vane is about 35 ft., the diameter over pillars being 20 ft., and over the eaves 28 ft.

The iron stand has been executed by Messrs. Steven, Bros., & Co., of Upper Thames-street, London, and Milton Ironworks, Glasgow, to the satisfaction of those concerned. The decorative painting and gilding have been done by Mr. Hartill, of Worcester-street, and Messrs. Bradney & Co., of Wolverhampton, were the contractors for the stone base. The whole has been performed under the personal superintendence of the borough surveyor.

THE COMPETITION FOR DESIGNS FOR THE NEW IMPERIAL PARLIAMENT-HOUSE OF GERMANY.

THE jury appointed to adjudge the prizes in the competition for designs for the New Imperial Houses of Parliament of Germany have already published their award:—

I. The two first prizes of 15,000 marks, or 750*l.* each, are awarded to,—

(*a.*) Herr Paul Wallot, architect, of Frankfort-on-the-Main, for his design (No. 124); and

(*b.*) Herr Friederich Thiersch, of Munich (No. 83).

II. The three second prizes of 1,000 marks, or 500*l.* each, are adjudged to,—

(*a.*) Messrs. Kayser & Von Grossheim, of Berlin (No. 131);

(*b.*) Messrs. Cremer & Wolffenstein, of Berlin (No. 93); and

(*c.*) Herr Heinrich Seeling, of Berlin (No. 147).

The five third prizes, each of 3,000 marks, or 150*l.*, are taken by,—

(*a*) Messrs. Giese & Weidner, of Dresden (No. 84);

(*b.*) Herr Hubert Stier, of Hanover (No. 104);

(*b.*) Herr L. Schupmann, of Berlin (No. 138);

(*d.*) Messrs. Busse & Schwechten, of Berlin (No. 153); and

(*e.*) Messrs. Ende & Böckmann, of Berlin (No. 157).

It will be observed that, although they have not taken a first prize, the Berlin architects have been very successful, having carried off six prizes out of the ten. It is stated that out of the 196 competitive designs about eighty came from Berlin alone. The Berlin competitors have won all the three second prizes, and three out of the five prizes class as third, There were 800 programmes given out by the committee, so that, assuming they were applied for by genuine intending competitors, it appears that nearly 25 per cent. of the applicants carried out their intention and became real competitors. So strong or numerous a participation in an open competition has never before been known in Germany. The nearest approach to it was the competition for the Hamburg Town-hall in 1876, where 144 competitors entered the lists. The first competitions for the German Imperial Parliament House in 1872, when the late Sir Gilbert Scott took the second prize, was open to Englishmen and other foreigners, yet only 102 designs were sent in, twenty-three of them being by foreigners. In the present competition, which was limited to Germans and natives of the German-speaking parts of Austria and Switzerland, there were no fewer than 196 competitors. The next most keenly contested cases were the competition for the New Strasburg University (in 1878), where 101 designs were sent in; the Berlin University (in 1863), where fifty-one, and the Vienna Town-hall (in 1869), where sixty-three architects took part in the struggle.

The whole of the 196 designs, embracing, it is said, no fewer than 3,000 separate sheets of drawings, are now hung in the temporary premises of the Museum of Art Industry at Berlin. It is stated that a large number of the competitors fearing, after the warning example of the Hygienic Exhibition, that their drawings might be in danger from fire, had wisely taken the precaution to have each his own drawings insured against loss by fire. This they did in ignorance of the fact that the Government through the Commission had already insured the whole of the drawings.

It will be observed that the two first prizes have been taken by architects of whom hitherto little or nothing has been generally known. The very names of Herr Paul Wallot, of Frankfort-on-the-Main, and of Herr Thiersch, of Munich, were till now comparatively unknown. On the other hand, the name of Herr Bohnstedt, who took the first prize in the first competition for 1872, is now nowhere; although he is said to have entered again on the second occasion, his name does not appear amongthe list of successful competitors. The question, what architect is to be appointed to see the work carried out, is quite independent of the result of the new competition, and the Commission will, it is understood, announce their selection almost immediately.

With respect to the successful competitors, the German papers state that Herr Paul Vallot, who won a first prize, has for some time been engaged as an architect in Frankfort He is a native of Oppenheim, on the Rhine and is under forty years of age. He was edu'

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cated at the Berlin Bau-Academie, and travelled for the purpose of studying architecture in England and Italy. Many of the new private houses in the principal thoroughfares of Frankfort were designed by him, and he has distinguished himself in several public competitions for monumental works in Germany within the past ten years. Professor Thiersch, who takes the other first prize, is only thirty years of age. He studied at the Polytechnicum at Zurich, and was a pupil of the noted architect Gottfried Semper. He assisted in designing the decorative parts of the new Opera House and the new railway-station at Frankfort, and has for three years been professor of the Munich Academy and School of Art Industry.

The chief feature in the present competition is that most of the prizes have been taken by young and comparatively unknown men. There are many architects of far greater name among the competitors, but they have, with one or two exceptions, been beaten by their pupils. The labours of the committee of judges are not concluded. They have authority to purchase, in addition to the prize designs, any other drawings presenting features which they may desire to have adopted in the new Parliament House. The German Government, in appointing the committee of judges, took care to avail itself of the best architectural talent, not only of Germany, but of the neighbouring States. Thus, besides several members of the Reichstag, the committee numbered the following professional gentlemen among its members:—Herr Ferdinand Schmidt, of Vienna, representing the Austrian architects; Herr Vincenz Statz, of Cologne, connected with the cathedral there; Herr Siebert, of Munich; Herr Adler and Herr Persius, of Berlin; Professor Egle, of Stuttgart; and Herr Martin Haller, of Hamburg. All the above are architects, and with them on the judging committee there was associated the celebrated painter, Herr Anton von Werner.

HOUSES AND HOUSE-BUILDING IN BUENOS AYRES.

SIR,—The following notes regarding the present state and prospects of the building trade of Buenos Ayres, capital of the Argentine Republic, may be of interest to your readers, especially as they show what a great field there is now open for men of enterprise and capital.

This city is the seat of a large and rapidly-increasing trade, and being the principal port and business centre of an immense and wealthy country, it is bound to go ahead.

Two causes have also arisen during the last two years to give an increased impulse to its development, namely, the establishment of a strong national Government, which insures peace and prosperity; and the federalisation of the city,—that is, making it, like Washington, the neutral capital of the thirteen states and other territories which compose the Argentine Republic. As a consequence the population is rapidly increasing, and though the building trade is now very active, and has been so for over two years, the demand for houses, shops, and warehouses still far exceeds the supply. So that whilst rents are continually being raised, people have to submit, knowing that many are putting up with inconvenient premises, and others cannot be accommodated at all.

Before going into details of the business, I will give a brief description of the city.

Buenos Ayres has a population variously estimated between 200,000 and 300,000; but it covers a larger area than a city of this population in Europe would occupy. Roughly speaking, the size of the built-on ground is about five miles by three, but there are roads leading out to neighbouring populous towns which are lined with streets and villas for six or seven miles. The city is regularly laid off in streets which cross each other at right angles. These streets are about 150 yards apart, and for the most part are not above 30 ft. to 35 ft. wide. There are no "mews lanes" between the streets, which causes much loss of ground and inconvenience, as carriages, horses, and all rubbish, have to be taken through the front doors.

The site of the city is nearly flat, and, as a large number of the houses are of one story and of very common style, the appearance of the town is very far from prepossessing. There are, however, some very beautiful, even magnificent, buildings, public and private. But what is notable and singular is, that there are almost no fashionable or select localities, and we see palaces and hovels, colleges and workshops, first-class shops and market-places, in mingled succession. A change in this state of things must naturally be expected, so that it must be a good speculation to buy up the tumbledown hovels and low-class houses to be found at frequent intervals in the leading thoroughfares.

The usual plan of houses is that which is to be found in Spanish countries, and resembles the Moorish or even the old Pompeian style. The rooms are built round internal open courts, or, as they are styled, "patios," and all open into a piazza or corridor which surrounds the court. The communication is made by doors, glazed in the upper part, which serve thus as windows. Generally there are three of these "patios," separated by cross rooms, but a communication runs through them, which, in large houses, is wide enough for a carriage.

The street elevation of modern houses is generally very tastefully treated, but formerly this was neglected. The windows to the street are still covered with iron gratings, of more or less tasteful design. The roofs are usually flat, styled "azoteas." Much more attention was usually given to the decoration of the principal court-yard than to the front of the house, and these "patios" are in most cases very handsome and pleasant retreats.

This construction is very well suited for the summer, which in this genial climate may be said to extend over three-quarters of the year. But in the winter months the houses are not quite so comfortable, especially as many have no fireplaces.

This plan occupies a good deal of space in comparison to the accommodation afforded, and presents considerable inconvenience when two and three storied buildings are required, as they now are, owing to the value of building sites in the central districts. These houses, too, are usually too large and expensive for families of moderate number and means. There is a great want at present for smaller houses of respectable style. A still more urgent want is for workmen's houses. The working classes, in fact, live most uncomfortably in great yards, which are surrounded by meanly-built rows of single rooms, opening directly into the open air. The centre of these yards is often a mass of corruption.

The drainage and water-works designed and commenced by Mr., now Sir J. F. Bateman, C.E., London, some years ago, have been lying unfinished for four years, but it is most probable that they will now soon be finished.

The common building material is brick, which can be turned out of very good quality near the city. The usual size of brick employed is about 12 in. by 6 in. by 2 in. Lime is burnt in the city. Stone has to be brought from the Bunda Oriental. Native marble is found of a good quality, but the greater part of that used comes from Italy. It is most surprising, considering this, to see how marble is lavished on constructions. Some of the fine houses are actually encased in white marble slabs, whilst the most ordinary houses have plinths, window-sills, stairs, and hall pavements of this material.

Pine timber has to be imported from North America, but the country has abundance of hard woods and cedar. Cement and flat tiles, as well as all fire-clay goods, are imported from Europe. I shall append to this letter a list of current prices of building materials and labour, and from it I think it will be seen that the expense of building can scarcely be so great as to account for the high rents asked. Taxation is pretty high on house property, but, with all the costs and charges, I am of opinion that the rents are excessive in comparison to the value of property.

That you may form an idea of the present rates of rent, I have made a rough calculation that dwelling-houses of the middle class cost about the rate of 1*l.* 5s. to 1*l.* 15s. per room monthly (calling each apartment a room). Thus a house of four rooms costs 7*l.* 10s. to 8*l.* per month. A twelve-roomed house about 17*l.* per month (rents are all payable monthly). A villa in the outskirts will cost from 200*l.* to 400*l.* a year rent. A very ordinary warehouse will cost from 300*l.* upwards. A fair-sized retail shop in a good street may cost as high as 600*l.* a year.

It is difficult to learn the average interest which investments in property bear here, but I believe that it cannot be less than 12 per cent. annually. This is corroborated by the fact that money is freely borrowed at the rate of 9 per cent. for the erection of new buildings. High as this interest may appear to the European investor, it does not, as he might suppose, represent a corresponding risk. For, as I have said, there is no difficulty in letting properties, and the law here makes the landlord a favourite creditor, letting him collect his claim in full from bankrupt tenants, and to execute for rent with facility. Life and property run no more risk in Buenos Ayres than in European capitals. Fires are of very rare occurrence, owing to the absence of hazardous trades and of fire-places in houses.

In spite of the high rate of interest obtained from building property, other industries in this Republic give so much higher returns that building investments are looked on as only fit for ladies and elderly people who wish to live quietly and securely.

The building trade is at present almost entirely in the hands of Italians, who certainly display considerable constructive ability.

There are a few architects of other nationalities who do very well, having generally a good connexion. But in general the same person combines the trade of architect and builder. In many cases these are men risen from the ranks of workmen, and who frequently build without plans.

There are no building societies here yet, and it is a general opinion that such societies would do well, but there are no parties here of sufficient experience or capital to head them. Were such an enterprise properly started its success would be assured, but the genius of the people of this country does not run to the formation and management of joint-stock companies.

Should any of the parties who read this letter be in a position to organise a building society, and to head the subscription for shares, I am of opinion, from inquiries I have made, that I could immediately place a considerable number of shares.

I am also of opinion that competent builders with some knowledge of architecture and a sufficient capital to start with, will find a fine field at present in this Republic. The air is full of projects just now, all indications of future prosperity. Besides the water and drainage works already mentioned, we have the near prospect of vast harbour improvement works, and the new railways to Chili and Bolivia being completed.

The new English banks have lately been started, namely, the English Bank of the River Plate and the Argentine Trust and Loan Company. Money can be readily obtained from the various banks now at work. Two banks are at present erecting splendid edifices, namely, the Italian and Carabassa & Company, and the English Bank is about to build.

Besides, we have the prospect of building an entirely new city; for, as I have stated at the beginning of this letter, the city of Buenos Ayres was, in 1881, converted from being merely the capital of the province of that name to be the capital of the Confederation. The Provincial Legislature have had, therefore, to find a new capital, and after prolonged discussion they have chosen to create a city in the vicinity of the port of Eusenada to be styled "La Plata." The site of this projected town is about thirty miles from Buenos Ayres, and is at present unoccupied. It is a flat land, slightly raised, and sloping gently towards the river.

Here is a fine opportunity for inventors of sanitary improvements to put their theories into practice; a chance to build Dr. Richardson's famous "City of Health" under one of the most genial climates of the world.

The Provincial Government lately advertised for plans for all the principal buildings required in such a city,—Capitol, post-office, cathedral, banks, theatres, official and private residences. This competition has not been sufficiently widely known, nevertheless a goodly number of plans have been sent in which are now on exhibition in a public hall here. Many of these projects have come from Europe, as indicated by the lettering on plans being in different languages, so that some of the competitors may be amongst your readers.

The great bulk of the projects have been rejected, for not complying with the rules of the competition, and one for being an exact reproduction of a building erected in Paris for the Mairie of the Fourth Arrondissement. The pictures of this building in the *Revue Générale de l'Architecture*, edited by M. Cæsar Daly, 1872, plates 5, 6, 7, are displayed alongside of the plans of this competitor, to show his flagrant

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plagiarisms. One beautiful design for a cathedral, evidently from London, motto, "Fiat Justitia Ruat Cœlum," has been disqualified on account of having 1,000 mètres square less area than that stipulated.

The following designs have been awarded prizes:—Government House.—First prize, motto, "Hinc Labor hinc Merces" (French lettering on plans), style Italian Renaissance; second prize, motto, "La Plata," also French. Cathedral.—First prize, "Domus Domini," French; second prize, "Ut Unus," Spanish. As arrangements are very far from being complete there is still abundance of time for English architects to have a chance of obtaining some of these buildings. I may be able later on to send you more information.

I will now give a price current of the principal building materials:—

Bricks, 12 in. by 6 in. by 2 in., per mil, delivered, about 58s.
Lime, 1s. 10d. per bushel.
Flat tiles (French manufacture), 25s. per mil.
Portland cement, 16s. 8d. to 17s. barrel of 300 lb.
Lumber, Canada white pine, 11*l.* 8s. per mil. super.
Spruce, 10*l.* 8s. 4d. per mil super.
Pitch pine, 14*l.* 11s. 8d. do.
Iron bars and bundles, 11s. 6d. per cwt.
Castings, 30s. to 40s. per cwt.
Galvanised corrugated iron, 25s.
Paints—white lead, best, 9s. 4d. per keg 25 lb.; green, common, 10s. per keg 25 lb.
Linseed oil, 25s. five-gallon drum.
Window glass, 19s. box 100 super. feet.
Tin plates,—charcoal, 34s.; coke, 30s. box.
Steam coal, 66s. per ton.
Nails, Paris points, 18s. cwt.
Wages:—Bricklayer, 8s. 6d. per day; carpenter, 8s. 6d. to 10s.; helpers, 5s.; blacksmiths, 16s. 8d. upwards per day, very scarce.

To any person of the classes I have indicated who think of coming out here or exporting goods to this market I will be glad to give more detailed information; but, as former letters which I have published with regard to the industries of this country have generally brought me many letters from enterprising young men without capital, I may as well anticipate their case by informing them that unless they know the Spanish language their only prospect will be to take to the rough life of the country in agriculture or sheep-farming. So many men have, however, come out here without means, and have made fortunes in these lines, that I do not wish to discourage any hard-working man; but it is well that intending emigrants should know what to expect. JOHN SAMSON.*

THE PUBLIC OFFICES SITE BILL, 1882.

WE are enabled to state that this Bill, for the acquisition of property and the provision of new buildings for the Admiralty and War Office, has passed through Committee, and has been reprinted for final reading in the House of Commons. The Select Committee which considered the Bill approved the preamble with such rapidity that the protest of the Royal Institute of British Architects against certain defective features of the scheme of the First Commissioner to place the new buildings on what is known as the "Spring Gardens Site" was not read; nor was the request of the Council to be heard granted. The plan of the official scheme, as proposed to be completed by H.M. Office of Works and Public Buildings, has been published in the Institute "Journal of Proceedings," together with the protest addressed to the First Commissioner, as follows:—

"15th June, 1882.

SIR,—Having given some consideration to the Public Offices Site Bill, and to the plan which accompanies it, prepared in H.M. Office of Works, the Council of the Royal Institute of British Architects venture to point out what appear to them, judged from a public and architectural point of view, objectionable and defective features in the scheme, viz.:—

1. Without more particular information than is possessed, it is impossible to assert that the proposed site is not sufficient for the proper and convenient accommodation of two great Public Departments, but the manner in which the projected buildings are planned in block, with inadequate and cramped quadrangles, conveys the impression that a crucial defect of the scheme is to attempt to crowd too much within the limits of a site inadequate for the purpose.

2. Should it, however, be determined to locate Government Offices on the Spring-gardens site, it ought to be an indispensable feature of the scheme that the Mall should be continued and opened up to Charing-cross, somewhat after the manner indicated on the accompanying plan.

3. Although the retention of the existing banking premises of Messrs. Drummonds and of Messrs. Cocks & Biddulph, is not incompatible with such opening-up of the Mall, yet any comprehensive scheme for the acquirement of the Spring-gardens site, for the purpose of Government Offices, ought unquestionably to embrace these properties as well as the remainder of the property in Spring-gardens having frontages to Trafalgar-square. By avoiding such properties, the scheme proposed in the Public Offices Site Bill may commend itself on the score of economy, but to locate important Public Offices in the background, shut in from one of the principal frontages in London by property of an inferior character, is a scheme, which, from all other points of view, would appear to court condemnation, and which, if carried out, must of necessity entail discredit and failure. On the other hand, by acquiring the whole of the Spring-gardens site, including the frontages to Charing-cross, although the cost would be greater, an opportunity would be afforded for inaugurating a great public improvement, and for erecting public offices on a more liberal and comprehensive scale, such, probably, as might be deemed worthy of the site and of the nation.

We are further instructed to add that, should it be the wish of the Select Committee, the President of this Institute will be happy to attend and give such further explanations as may be desired.

We have the honour to be, Sir, your obedient servants,

(Signed) J. MACVICAR ANDERSON, Hon. Sec.
(Signed) WILLIAM H. WHITE, Secretary.

The Right Hon. G. J. Shaw-Lefevre, M.P.,
First Commissioner of H.M. Works and
Public Buildings, Whitehall-place, S.W.

We shall return to the subject next week, when we hope to show that this additional chapter to the ludicrous "Story of the Government Offices," published in the *Builder* (1877, page 852), is similar in character to those other chapters in the history of half a century, which disclose the incompetence of the English system to initiate or even to deal with the artistic improvement of the great highways and public buildings of London.

THE HYDE PARK IMPROVEMENT SCHEME.

THE scheme of the First Commissioner of Her Majesty's Works, &c., to ostensibly remedy the block in the traffic at Hyde Park Corner and at Hamilton-place is, we are informed, to be carried out, in spite of friendly remonstrance, and in opposition to opinion both practical and professional. The objections to the proposed removal of Burton's arch from its present position to a site lower down, where it is to form an entrance to the Green Park of the same character as that of the Marble Arch, are numerous, as we have already pointed out; and the removal is likely, from all appearances, to cost more than was at first supposed—a removal, moreover, which is to be effected principally at the cost of the Metropolitan ratepayers. A notice of motion in the House of Commons was given by Sir Harry Verney as follows:—

"On the Vote of Money for the removal of the Wellington Arch from Hyde Park Corner, to move, That it be referred to a Commission, consisting of members of the Institution of British Architects and of those whose authority in matters of art is recognised, to say whether it is desirable, in an artistic point of view, to move the Wellington Arch from its present position, where it forms part of an architectural group, to a spot on Constitution-hill, lower, and where it would be askew both to the Colonnade at Hyde Park Corner and to Grosvenor-place."

He afterwards put himself into communication with the President of the Royal Institute of British Architects, who brought the matter before the Council. The result has been that a deputation consisting of the President, Past-Presidents, Vice-Presidents, and a few other members waited last Tuesday on the First Commissioner for the purpose of offering some suggestions whereby the Wellington Arch might be retained in its present position, and Piccadilly so widened opposite Hamilton-place as to effectually remedy the present perpetual block of traffic at that spot. The deputation explained their views by means of a plan which had been prepared expressly for the purpose, and submitted the following heads of suggestions, intended as a modification simply of the official scheme, viz.:—

1.—That the accompanying plan (whereby the arch is retained in its present position) meets the public requirements of traffic better than any hitherto proposed.

2.—That there is nothing in the said plan to preclude the removal of the Arch to the proposed entrance to Constitution-hill, should it be deemed essential.

3.—That it is undesirable to retain the statue of Wellington on the Arch, whether the latter be moved or not.

4.—That if the Arch be moved to the proposed entrance to Constitution-hill, an appropriate site for the Wellington Statue and pedestal, if suitably treated, would be found where the Arch now stands.

The Metropolitan Board of Works has consented to receive a deputation from the Institute, the object of the latter being to urge the retention of the Wellington Arch in its present position, and the removal only of the incongruous statue to some suitable pedestal. We shall give an account of this next week, and publish the plan suggested by the Council of the Institute.

ANCIENT MONUMENTS.

THE Ancient Monuments Bill which has been introduced by the Government selects (says the *Times*) certain ancient remains in the three kingdoms with regard to which it is proposed to empower the owner of any of them to constitute the Commissioners of Works the guardians of it. Thenceforth the Commissioners are to "maintain" it; that is, to fence, repair, cleanse, cover in, and do any other act required for repairing or protecting it from decay or injury. However, the owner is still to have in other respects the same estate in the monument as before. Another power which the Bill proposes to confe is for the Commissioners of Works, with the consent of the Treasury, to be permitted to purchase, out of any moneys which may be provided from time to time by Parliament for that purpose, any ancient monument to which the measure applies. With a view to such purchase, the Lands Clauses Consolidation Act is to be incorporated in the Bill, except those provisions which relate to the taking of land otherwise than by agreement. Power is also given to any one to give or bequeath his interest in any of these ancient monuments to the Commissioners of Works. The Bill further imposes on the Commissioners the duty of appointing an inspector of ancient monuments, to report on their condition, and on the best mode of preserving them. The penalty for injuring any of these ancient monuments is either a fine not exceeding 5*l.*, and also the amount representing the damage, or imprisonment for a term not exceeding a month. But the owner is not to be punishable under this provision, except in cases where the Commissioners have been constituted guardians of the monument. For the purposes of the measure the term "owner" includes not only the owner in fee, but the holder of a long lease or an estate for life.

In the House of Commons, on Monday, Sir J. Lubbock asked the First Commissioner of Works what steps Her Majesty's Government had taken to carry out the unanimous resolution of the House that, pending the passage "of a general measure dealing with the ancient monuments of the kingdom," and in order, as far as possible, to protect them from further injury, it was desirable that her Majesty's Government should appoint one or more inspectors with authority to inspect and report upon such ancient monuments. Mr. Shaw-Lefevre, in reply, said: I may point out to my hon. friend that I have introduced a measure on the subject of ancient monuments, and that one part of it will authorise the Government to appoint inspectors. As the measure in no way interferes with the rights of owners without their consent, I was in hopes that it would not meet with opposition, but the right hon. member for Whitehaven gave notice of opposition before the Bill was in the hands of members. I am not without hopes that when he has read the Bill he will withdraw his block.

The Sheerness Local Board, acting under the advice of their recently-appointed surveyor, Mr. H. W. Stringfellow, are considering the desirability of introducing Shone's pneumatic ejectors at the sewage outfall at West Minster, in place of the present inadequate pumping machinery. The ejectors would be worked by compressed air from the Board's waterworks, at a distance of one mile and a quarter from the sewage outfall.

* We are asked to say that communications for the author of this letter may be addressed to care of Mr. W. M. Adamson, 39, Finsbury-circus, London.

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RUSSIAN NEWS.

ARCHITECTURE is duly represented in the Moscow Exhibition. There is a most interesting display of materials for tracing the progress of Russian architecture during the last quarter of a century. The public seems rather shy of the architect's plans, sections, and elevations. There are, however, some fine drawings which should appeal to the untechnical. Several models, too, call for attention, in addition to those we have previously mentioned; that of a tower, by M. Tersky, and that of a village church, by M. Shokhin, may be named. The drawing of the façade of the new historical museum in Moscow is remarkable, presenting, as it does, a somewhat bizarre striving after a national Russian style. It will not, however, strike the visitor from "Europe" as entirely satisfactory, nor impress him with its entire suitability to the purposes of a museum. It is lighter and more fantastic than the façade of the Polytechnic Museum, which, if somewhat heavy, conveys the feeling of worth and solidity. There is, too, a remarkable design for a small church, by the Academician, M. Bogomolof, conceived, as one Russian critic maintains, in pure Slavonic style, with Slavonic ornament, and "not a trace of Byzantinism." There are five designs for the church to be erected over the spot where the late Emperor was assassinated. Of these designs, that of M. Tomishko won the first prize, that of MM. Goun and Kitner the second, that of M. Benoit the third, and that of M. Shreter the fourth. Of the five designs, that of M. Bogomolof is pronounced to be of the most original character, although the author received only honourable mention.

Of the exhibition generally we hope to set before our readers later in the summer an account supplied by a contributor who is about to visit Moscow. Meantime, we may remark that the undertaking seems so far a success, at least as regards the Fine Art and Industrial Art departments. Moscow is at present the scene of far more activity, and the focus of an influx of visitors such as has never before been known at this season, when most people are usually quitting the town for the summer withdrawal to the country,—a custom very generally followed in Russia by almost every one but the very poorest classes. The chief object which was the first motive of the present exhibition was to present a complete picture of the present state of Russian manufactures. This it is thought will not be so fully realised as was hoped, as many provincial manufacturers have stood aloof, and it required the utmost efforts of the organisers of the undertaking to get together from 300 to 400 exhibitors of articles of various sorts made at home by the peasantry. It was found necessary to travel about among the villages, to converse and explain to the home-workers that what was being done was to their advantage; that the comparison of work might, as Archbishop Macarius (recently deceased) remarked in his address at the opening, "conduce to the perfection and development of the capacity of the labourers."

The New York Bell Telephone Company has entered into a contract to establish telephonic communication between 200 subscribers in St. Petersburg. If the contract is not completed by the 1st of July next, the company loses the concession accorded to it.

Emigration to America from Finland has lately been increasing and is awakening some attention. The reasons of this movement scarcely find an explanation in the material conditions of the peasants, which is, generally speaking, good.

The report of the St. Petersburg Association for supplying cheap lodgings to the needy classes is worthy of attention, and will not be without interest to readers of the *Builder*. This association has already been more than twenty years in existence, and during that period has effected a great deal of good. The report just published is that for 1881. It bears witness to the steady perseverance of the association in the object for which it exists, which is chiefly to secure healthy homes for the poor at every period of life from childhood to old age. It owns two blocks, tenements in which are let out at rates varying from 6s. to 24s. a month, heating included. These prices, when the cost of lodging in St. Petersburg is considered, are certainly very moderate, and are such, indeed, as to draw many more applicants than the association can at present provide for. The sanitary condition of these residences seems very satisfactory, and it must be remembered that St. Petersburg is by no means a healthy city. There were no instances during the past year of epidemic diseases. The association has, moreover, a well-organised sewing establishment, which, during 1881, supplied no fewer than 200,000 uniforms to the military and naval services. Employment in this establishment affords the most indigent of the lodgers the means of living and of paying the low rent. For children there is a school and playground, where they are under surveillance. A certain number of them when old enough are put out to industrial schools at the expense of the society. This year a considerable extension of the good work of the association is contemplated, as its funds have been recently augmented by munificent gifts from individuals. A new block is to be raised of four stories in which the rooms will be over 11 ft. high, will be well ventilated and heated with steam. The rooms on the ground will be let out for periods not less than one week, the lowest rate being about 2½d. per diem, and there will be a common kitchen for all on the ground-floor. The rents for the upper rooms will vary between 8s. and 10s. a month.

REPORT OF THE COMMITTEE ON ARTISANS AND LABOURERS' DWELLINGS.

THE question of the housing the industrial classes of London, which has long been pointed out by us as grave, is becoming urgent. It hardly needed the report just issued by the Committee on Artisans' and Labourers' Dwellings to prove this to be the case. Under the Act of 1875, it seems that the Metropolitan Board has, up to this time, dealt with only fourteen areas, formerly inhabited by some 20,000 persons. To obtain the ground has cost 1,500,000*l.*, of which only 2½ per cent. has been recouped by rates. Thus we may take it that dis-possession has been effected at a cost of 1,140,000*l.* for that small number of souls, which is at the rate of 57*l.* per head. Assuming this cost to be that of the substituted sites (which is clearly under the mark), we have thus a ground-rent charge of 45s. per head per annum imposed on the new houses. It is evident that this would cause an intolerable pressure on the workpeople. But how the difficulty is to be met is not so sure.

That the danger of falling to the ground between the two stools of the vestries and the Metropolitan Board of Works may be obviated by following the recommendations of the Committee, we will endeavour to hope. But the financial difficulty is more obstinate. And we cannot omit to point out the inadequacy of the proposal to put the burden on third parties,—that is to say, the railway companies. That the urban and suburban lines of railway must play a very important part in the settlement of the artisan's abode question, there can be no doubt. It is one of the most important functions of these lines. And the subject should never be approached without memory of the noble words of Robert Stephenson, "that he hoped to see the day when no poor man could afford to walk."

But the fallacy in all such arguments lies in the avoidance of details. Not only is what the workman can afford an element in the case, but, no less, what the railway companies can afford. The idea is that the latter are to convey the former for a penny a trip, exclusive of distance. Even this moderate fare is an appreciable item as added to rent. It comes to 2*l.* 12s. per annum. Still, as that is for the bread-winner alone, and not (as in the case of the 45s. before mentioned) for every member of his family, we will take it that wages must be so rated as to include the charge. But for what distance can the companies afford to convey passengers for 1d. per head? There is a definite and not very wide limit to the range. People are too apt to draw erroneous conclusions from an arrangement that was possible with the penny post, but which is entirely impracticable when the cost of conveyance is not disproportionately small as compared with that of collection and delivery. Now, in the case of collection and delivery, the cost of third-class traffic is *nil*, or at the utmost very small. Almost the whole expense incurred is that of conducting the running traffic, and paying the interest on capital invested in line, stations, and working stock. The lowest rate at which, as far as experience goes, it has been found practicable to convey passengers, is about one-third of a penny per mile, and that has been on the cheap railways, and with the cheap labour, of India. On lines running through London the working costs are two and a half times as much per ton per mile as on the average of the United Kingdom. It is true that the great volume of traffic which fills the vehicles, and thus reduces the tare, is such as to reduce the working expenses to less than 40 per cent. of the total receipts,—but we are speaking not of ratio but of *bonâ-fide* cost. Then the amount required to pay interest on capital is eight times as much on a metropolitan line as on an average railway. It may be questioned, therefore, whether the companies could afford to run at less than ½d. per mile per passenger with justice to the proprietors and to the general customers. And even if we say ½d. per mile, we get four miles as a limit. It is true that it would cost less to run for, say eight miles without a stop than to run for four, making three or four stoppages. But we must not talk of less or of more, but of what can be done mechanically for a fixed sum; and as to this, we say that the limit of cost of a 1d. trip is rigid, and that the distance which it will cover is hardly enough to allow this expedient for increasing the area fitted for the home of the metropolitan working man to be very widely extended. It is important that this should be distinctly understood.

THE DWELLINGS OF THE INDUSTRIAL CLASSES.

THE thirty-eighth annual general meeting of the shareholders of the Metropolitan Association for Improving the Dwellings of the Industrial Classes took place last week, at the offices in Finsbury-circus. The chair was occupied by the president, Lord Claud Hamilton, M.P., who was supported by the Right Hon. Dudley F. Fortescue (deputy chairman), Mr. G. W. Alexander, Mr. W. Baily, Mr. Julian Hill, Mr. J. H. Janson, and Mr. L. Loyd (director), and Mr. C. Gatliff (secretary).

The report was read by the secretary, who stated that the directors were enabled to report a full year's average occupancy of the dwellings of the association, notwithstanding increased competition not only of the trustees of the Peabody Fund, and kindred associations, but also of the building trade, who, encouraged by their example, had invested very largely in the erection of similar dwelling in flats, and also in building cottages in the suburbs. The state of the dwellings of the working classes, and the operations of the different building societies, had been brought prominently into notice by the appointment of a select committee of the House of Commons on artisans' and labourers' dwellings improvement. Some of the associations called into existence by their example had built dwellings of a superior class, some of them with sufficient accommodation to command rents of 70*l.* and 80*l.* a year. These dwellings had undoubtedly conferred great benefits on those who resided in them, but their association had strictly confined itself to provide cheap and healthy homes for the working classes, so as to preserve health and decency of deportment and keep themselves and their children from moral and physical contamination, and afford a fair return for the capital invested, eleemosynary relief being foreign to their views. The directors had not this year taken any additional site. The deaths on the entire property of the association had, during the year 1881, been eighty-seven (fifty-six of which were of children under ten years of age, twenty-eight of the latter being less than twelve months old), out of an average population of 6,084. It appears, therefore, that the average rate of mortality in the dwellings of the association, as verified by the district registrars, had been 14·3 per 1,000, while that of the whole metropolis had been 21·2 per 1,000. The profits for the year amounted to 9,397*l.* 16s. after meeting all the expenses, and after providing for a dividend of 5 per cent. there remained a balance of 991*l.* 11s. 9d., irrespective of 374*l.* 15s. 1d. already added to the guarantee fund, being the year's interest on the same. The sum of 1,366*l.* 6s. 10d. therefore represents the total net profits of the year, of which 991*l.* 11s. 9d. remained, which the directors recommended to be added to the guarantee fund.

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The Chairman, in announcing that the Hon. Dudley F. Fortescue and Mr. T. F. Gibson retired by rotation from the Board, said that he much regretted the resignation of the latter, as he felt he could no longer undertake the duties of the post. He (the chairman) was now the only one of the original directors left.

Mr. Loyd moved the re-election of the Hon. Mr. Fortescue, which was carried unanimously, as was also the re-election of Mr. T. Baker (auditor).

In moving the adoption of the report, the Chairman said the object for which their society was started had occupied public attention much more extensively lately than at the former time, and they had had many important rivals, such as speculative builders, the Corporation of London, the Metropolitan Board of Works, and other bodies. When he mentioned that the Metropolitan Board of Works had expended 1,500,000*l.* in such buildings, of which 1,100,000*l.* was a dead loss, the shareholders would see that the association could not think of competing with the bodies which could "put their hands into other peoples' pockets," by means of rates. Only one of their blocks of buildings, however, was not fairly well occupied, and that was owing to the lack of employment in the neighbourhood (Stoke Newington). The report having been adopted, a unanimous vote of thanks to the directors was agreed to.

THE LATE MR. ROBERT PALGRAVE.

THE death of this gentleman, which took place at his residence, No. 9, Upper Hamilton-terrace, St. John's Wood, on the 19th ult., will cause much grief among all who knew him. He was the only son of Mr. Robert Palgrave, of London and Bedford, and was born in the year 1831. He was nephew of Mr. C. F. Palgrave, who was Mayor of Bedford in 1851. He was articled to Messrs. Scott & Moffat, architects, and on leaving their office, he became, for a short time, assistant to an architect at Blackburn, in Lancashire. Returning to London in 1852, he became managing assistant to Messrs. Wehnert & Ashdown, architects, of Charing-cross, now both deceased. Quitting their office in 1857, he commenced practice as an architect at Pall-mall East. His first work was the Clock and Watchmakers' Asylum, at Colney Hatch, which work he gained in public competition. In 1857 also he was appointed architect to the well-known and extensive Britannia Ironworks, at Bedford. These works were erected from Mr. Palgrave's designs. Mr. Palgrave also designed some extensive farm buildings at Sidlington, and St. Mary's Wesleyan Chapel, Bedford, and likewise Kempston Chapel, near Bedford, which were erected from his superintendence, as also the Atlas Ironworks, for Messrs. H. Clayton & Co., in the Harrow-road, London, and additions to residence at Bedford for Mr. James Howard, M.P. Indeed, it may almost be said that Mr. Palgrave renovated the town of Bedford, where his principal practice lay, and his works may be seen in all directions. The chief one, however, has yet to be mentioned: this is no other than the rebuilding of the tower and other extensive alterations and additions to the venerable Church of St. Paul, Bedford. It may here be mentioned that great difference of opinion existed at the time for the restoration of this church as to the desirability of entrusting a work of such importance to Mr. Palgrave; and Mr. G. E. Street was called in to make a plan and a report, which he did before he knew Mr. Palgrave had been employed. It will always redound to Mr. Street's honour that, as soon as he was shown Mr. Palgrave's drawings, he at once withdrew and strongly advised the committee to leave the matter unreservedly in Mr. Palgrave's hands. The work, therefore, proceeded, and the result shows its complete success. In 1861 Mr. Palgrave was chosen with a select number of architects to compete for the Agricultural Hall, at Islington, and much preference was expressed in favour of his design, and, on a division taking place (between the drawings of Mr. Palgrave and those of Mr. Peck), the committee were equally divided; the chairman, however, gave his casting vote in favour of Mr. Peck's design. Mr. Palgrave soon afterwards left Pall-mall East, and took more extensive offices at Westminster Chambers, when he was appointed architect to the Right Hon. Earl Cowper, Lord Lieutenant of Bedfordshire, and for whom he designed and superintended some additions and alterations at Panshanger, Hertfordshire. This may be said to have been Mr. Palgrave's closing work, for, losing his uncle, the Mayor, and both his parents, about this period, he inherited ample fortunes, and soon afterwards virtually retired from practice.

The writer of this notice, who was associated with him for nearly twenty years, can testify to his sterling worth and his amiable and fair-dealing disposition. He was never married.

W. F. POTTER.

THE SEASON FOR FELLING TIMBER.

THAT there is a right season for felling timber, and that the value of timber for building purposes largely depends on this season being chosen, are generally admitted facts; yet the practice of different peoples and districts is found to vary most essentially. Thus, according to a German writer, while the time for cutting timber for building is legally fixed in Germany in the months of November, December, and January, in the Alpine districts of Switzerland and Austria the best and most durable timber for building is considered to be that which is felled in the summer. The reason of this is that the wood of coniferous trees, fir, pine, &c., contains least moisture in May and June, and as the felled timber is left on the ground till the following winter, it becomes well dried before it is taken away.

However this may be with the coniferous trees of the mountainous districts, it is certain that the trees in the plains require different treatment. The question has been subjected to a series of tests in Germany, and the result is sufficiently conclusive. In one case the experiment was with four beams of equal length, breadth, and thickness, sawn and shaped in the same fashion, cut from trees of the same kind growing close to one another, and kept on the same dry spot, the only difference between them being that they were cut in four different months. The timber felled in December was the strongest of all; that cut in January was 12 per cent. inferior to it in point of strength or power of bearing pressure; that cut in February was 20 per cent.; and that cut in March, 38 per cent. weaker than the December timber. In another experiment, entire pine trees were buried in a moist, damp soil; one sort had been felled in December, the other in February. It was found that the latter had turned rotten in eight years, while the former was sixteen years before it decayed. A similar experiment with deal planks showed that those sawn from trees felled in March decayed in two years, while planks from December timber lasted six years.

THE ROTHERHITHE BATHS AND WASHHOUSES.

THE success which has attended the recently erected baths and washhouses at Rotherhithe is an answer to those who are so often asserting that these establishments are not, as a rule, self-supporting. At last week's meeting of the vestry a statement was read from the commissioners of the baths, from which it appears that the entire expenditure for the year just ended was 1,535*l.*, the items showing that coals had cost 376*l.*; water, 174*l.*; rent, 78*l.*; and soap and soda, 40*l.*; and that 774*l.* had been expended in salaries. It was added that the value of the articles in hand was 40*l.* The number of persons who had used the baths during the year was 115,361, of which number 13,804 had used the washhouses. The total receipts amounted to 1,698*l.*, and adding to this sum the value of the articles in hand, there was a balance in hand on the working for the year of 211*l.* The report added that 200 boys had learned to swim during the year, and it also further pointed out that the baths had been largely used by the working classes during the year, 35,421 persons having used the second-class swimming-baths.

DESTRUCTION OF A THEATRE.

AT about half-past eleven o'clock on Monday morning, the 26th inst., fire broke out in the theatre of the Russian Baltic port of Riga. The conflagration lasted until the edifice was completely gutted. There was no loss of life, nor did the fire extend to any building except the theatre. The latter, however, was entirely destroyed, only the four bare walls being left standing.

THE CONDITION OF THE IRON TRADE.

AT the close of the half-year the condition of the iron trade is ascertainable approximately, and its importance, as well as the dependence of other great industries upon it, justify the reference. In the half-year it is clear that there has been some slight reduction in the amount of the crude iron produced; for in the two chief iron-producing districts,—Scotland and Cleveland,—there is a decrease of about 60,000 tons from the quantity made in the corresponding half of last year. In round numbers, Scotland has been making 100,000 tons of pig-iron monthly, and Cleveland about 225,000 tons monthly. The stocks in both districts have been reduced, and that largely in the six months,—possibly by about 150,000 tons, and that it is apparent that not only has the consumption been more than the production, but the consumption has largely exceeded that of the corresponding period of last year. And, with local exceptions, it is probable that the general experience of the whole of the iron-making districts of the country has been in that direction. Hence it is certain that the demand for iron in the past six months has improved, and as prices are above those of a year ago, the volume of demand has been also accompanied with a corresponding increase in the value. These are the chief of the facts in relation to the crude iron trade that are now obtainable, and their testimony is, on the whole, a favourable one for the trade.

In the manufactured iron trade all that can be said is that the great briskness that was known at the beginning of the present half-year has been continued, and that whilst the market prices of iron are not much changed, there has been a steady increase in the realised prices of iron, owing to the running out of contracts at very low prices, and their replacement by those at rates more nearly approximating to the market rates. Practically, the great bulk of the forges and rolling-mills in the kingdom have been employed in the past half-year. A large part of the work is due to the activity in the iron ship-building trade, and though there are not so many new orders being given out as there were a few months ago, there is, it is known, work now contracted for to give a continuance of the activity to the rolling-mills for several months to come. And as the iron rail trade is now almost entirely a thing of the past, this briskness about the rolling-mills is the more notable. It is hoped, too, that the strike in the iron manufacture in the United States will have added to the orders that our iron-masters have received, but there is little really ascertainable as to the extent of the orders that have been received. Its effect, however, has been to lessen very materially the stocks in the hands of the makers abroad, and thus to make more possible larger orders. Altogether, then, the condition of the iron trade has been improved in the last half-year. It has been rendered more lucrative to the makers, and the dead stock in their hands has been much reduced, whilst even the advanced prices that have prevailed cannot have diminished the demand much in the case of the crude iron, though they may have checked the demand for manufactured iron. There are the indications of further reductions in the stocks of pig iron in the hands of the makers, and these should bespeak further improvement in the tone of the trade, and lead to either a fuller production or to higher prices. And as it is generally acknowledged that the present rates are remunerative to those concerned in the production, the former of the two alternatives would seem to be that that would be for the ultimate and more lasting benefit of the trade. One of the remarkable features of the past half-year has been the enormous production of iron in several of the smelting centres from the ores that have been imported,—chiefly from the rich ores of Spain. The weakness in the price of this class of ores would seem to point to the fact that the production has been rather in excess of the demand, and it is probable that in the latter part of the present year the production will be rather diminished than increased.

A Recreation Ground for Walsall.—The Earl of Bradford, as lord of the manor, has presented forty acres of land to the borough of Walsall as a public recreation-ground.

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THE BRADFORD TECHNICAL SCHOOL.

THIS building was formally opened by H.R.H. the Prince of Wales on the 23rd ult. The building has been erected and furnished at a cost of 13,000*l*. Nearly two years ago we gave a description of it, together with a double-page view and ground plan.* It may be of interest at the present time, however, to give a few particulars of the building.

The building stands on the north-east side of Great Horton-road, upon a plot of ground formerly called the Tumbling Hill Close. Many years ago this land was quarried, but the supply of stone falling off, it was once more converted into cornfield and meadow until, on September 30th, 1879, it was sold to the council of the school for 3,500*l*. The site itself forms an irregular parallelogram, having a main frontage of about 160 ft. to Horton-road, with a depth of about 240 ft. along Carlton-place. At the rear of the building is a piece of waste ground recently purchased by the School Board, and upon which a large school will soon be erected to meet the requirements of the crowded population in the neighbourhood of Tumbling Hill. Nearly parallel to Carlton-place is a narrow street giving access to the backs of the houses in Lister-terrace, and forming the western boundary.

Within these limits, then, and upon an area of about 4,600 square yards, rise the three sections of the Technical School, two fronting Horton-road and one facing Carlton-place. The school consists of a connected group of buildings to be used for a variety of purposes, bearing directly upon technical education. Therefore, while harmony has been secured in the general design, the elevations have been studied with a view to give greater richness and finish to the more important parts: Thus, the public hall and museum that form the front rectangular block have an individuality easily distinguishable from that of the students' rooms along Carlton-place. The style of architecture is Italian, of the Venetian type. A colonnade of attached columns and pilasters of the composite order, resting on pedestalled dado, and surmounted by a richly-moulded entablature and balustrade, forms the chief feature of the design of the Horton-road frontage as well as the return end of the public hall. The spaces between the columns are occupied by richly-carved, moulded, and mullioned windows, varying in design to suit the rooms and floor levels. The principal entrance is, of course, in Horton-road, dividing the museum and library from the public hall, its two heavy columns, with architrave, frieze, cornice, and moulded arch projecting boldly from the main building line. Rising to a height of 120 ft. immediately over this entrance is a tower, the centre-piece of the façade, and, from its elevated position, a prominent object among the towers and spires of Bradford. The tower has an oblong base with attached columns and embrasures, and suitable corner ornaments. The central or cubical portion is pierced with long narrow windows, flanked with attached composite columns, and is surmounted by a dome and spire with ornamental base. The material employed in the erection of this façade was cleansed ashlar, while cut delf-stone wall-stones with ashlar dressings were used in the other sections. That part of the building which faces Carlton-place is to be devoted more especially to the work of the school, and has a separate entrance for students. Over this entrance are three gabled windows marking the position of the lecture-hall, and, higher still, a dome-shaped tower, 72 ft. high. A double row of large mullioned windows admit a plentiful supply of light from Carlton-place into the class-rooms and laboratories. Viewed from the waste-ground on the north-west, the weaving and spinning sheds, with their northern roof-lights give to the school the appearance of a large well-built mill. The school is surrounded by a palisade of ornamented iron rails.

Want of space precludes us from describing the interior of the building, but we may add that, in point of completeness, the building will compare favourably with any public edifice in the town. Great attention has been paid to the heating and ventilation. The whole of the basement is occupied by an almost interminable maze of brick flues, through which are carried about a mile and a half of hot-water pipes. At frequent intervals connexion may be opened between these flues and the outside, and, by means of a system of valves, cold air or hot air, or a mixture of both, can be passed into any or all of the rooms. There is, moreover, a system of exhaust-flues, worked by a small furnace in the basement, which, after the manner of colliery ventilation, insures a perfect and continuous output of foul air from the principal rooms. The hot-water piping has been fixed by Messrs. Taylor & Parsons, and the motive power used for heating purposes is derived from two large "Challenge" boilers, built by Mr. James Keith, of Edinburgh and Arbroath. Special precautions have been taken with the gasfittings, separate meters having been provided for the public hall, the staircases and corridors, and the students' department. All the pipes are of iron, and are carried along the external surface of the walls, so as to be readily accessible for alteration or repair. It may be added that the Prince of Wales and Mr. Forster spoke in laudatory terms of the new buildings.

Among the contractors are Mr. E. Atkinson, mason, Bradford; Messrs. Deacon & Whitaker, joiners, Shipley; Mr. Samuel Ryder, plumber, Mr. Charles Nelson, gas and laboratory fittings and fittings for new shed; Messrs. Charles Howroyd & Sons, plasterers; Mr. James Smithies, slater; Mr. James Lynn, painter and decorator; Mr. Harry Cliff, castings, Bradford; Mr. John Throp, carving-work, Leeds; and Messrs. E. & W. H. Haley, ironwork for the new shed; Mr. Black, concrete-work, Bradford. Mr. T. C. Hope, Bradford, is the architect, and Mr. Abner Rhodes clerk of the works.

* See vol. xxxix., pp. 504-5, 511 (Oct. 23, 1880).

THE STATIONERS' COMPANY'S NEW BUILDINGS IN THE CITY.

THE Stationers' Company have just taken down a number of old buildings in Ave Maria-lane, in front of their hall, and on the site which has been thus cleared an extensive pile of warehouses and offices is now in course of erection. The new buildings will have two commanding frontages, one in Ave Maria-lane, and the other in Amen-corner. The Ave Maria-lane elevation will be 105 ft. in length, and 57 ft. in height to the cornice, the extreme height to the ridge of the roof being 64 ft. There will be three lofty stories above the ground-floor, the last named portion of the frontage, up to the first-floor windows, being in Portland stone, with a range of four richly-carved arched windows in four divisions each, these being surmounted by a bold cornice, also in Portland stone. The principal entrance to the upper floors of the building will be in this frontage, above which is a sculptured representation of the Stationers' arms. The upper floors will be faced with ornamental pilasters and capitals, in Portland stone, surmounted by a second cornice, the remaining portion of the frontage being in Malm brick. Each floor will have a range of thirteen windows, the elevation being finally surmounted by pediment dormers on each side of a central gable, rising several feet above the general elevation. The Amen-corner frontage, uniform with the Ave Maria-lane elevation, will be 72 ft. in length; and at the south-east angle of the two frontages there will be a tower, 80 ft. in height to the apse of the vane.

The architect of the building is Mr. R. W. Mylne, and the contractors are Messrs. Patman & Fotheringham. Mr. Thomas Fisk is clerk of the works, and Mr. S. V. Adams the foreman. The cost of the building will be about 30,000*l*.

THE PROPOSED NEW WORKHOUSE AT CHAMPION HILL.

AFTER expending something like 20,000*l*. in the purchase of a site at Champion-hill, East Dulwich, for the erection of a large new workhouse, the estimated cost of which has been variously stated at 100,000*l*., and even 150,000*l*., the St. Saviour's Board of Guardians have at length come to the determination altogether to abandon the scheme, and to provide the further accommodation required by building an additional wing at the Newington Infirmary, Walworth. For some time past a strong opposition has been manifested to the erection of the proposed workhouse, by the owners and occupiers of houses at Champion-hill, on the ground that it would seriously deteriorate the value of property in the locality; and the project has likewise been further opposed in respect of the estimated enormous cost. Mr. Robinson, one of the members of the Board, in moving a resolution for the abandonment of the proposed building, observed that whilst the erection of the additional wing at Newington would only cost 10,000*l*., the carrying out of the Championhill project would involve the Board in an expenditure of 200,000*l*. The chairman observed that a number of houses would have to be purchased before they could build at Newington, and that 10,000*l*. would not by any means cover the cost. The resolution was, however, almost unanimously adopted, and the guardians have now the costly site at Champion-hill thrown on their hands.

NEW STATIONS ON THE SOUTH-EASTERN RAILWAY, AT DEPTFORD AND LEWISHAM.

THE South-Eastern Railway Company are about to erect new and enlarged stations at Deptford and Lewisham. A special interest attaches to the intended new station at Deptford. The existing station there is said to be one of the first railway-stations erected within the metropolitan area, having been opened in the year 1836, in connexion with the London and Greenwich Railway, one of the first lines in England opened for traffic, and it is recorded that its opening was signalised by the performances of a band of music, together with those of a barrel-organ, which are said to have accompanied the passengers to the station. The present station having become altogether unequal to the traffic, the intention is entirely to rebuild it on a much-enlarged scale, not only as a passenger station, but in combination with a goods and coal depôt, extensive new warehouses forming a main feature in the intended buildings. The company have had to purchase a considerable quantity of land as a site for the new and enlarged buildings, and the land having been secured the works will shortly be commenced. In addition to the works at Deptford, a new station is to be erected for the Lewisham main and loop lines, whilst the present station at Lewisham is to be materially enlarged.

ILLICIT COMMISSIONS.

REFERRING to the speech made by Mr. Cossins at the annual dinner of the Birmingham Architectural Association, noticed in our last, "An Ironfounder" writes to the *Birmingham Gazette* to say that he is afraid the "black sheep" are more numerous than the white ones in the profession. He proceeds to say,—

"I know that even some who are considered at the top of the tree in their profession, not only do not scruple to accept bribes in the shape of commissions from tradesmen to specify their goods, but will not allow their clients (if they can help it) to do business with firms who do not play into their (the architect's) hands in this respect. That the system is most dishonourable there cannot be any doubt, as the architect is, or ought to be, the policeman paid to look after the interests of his client instead of assisting others to rob him, for the extra profits put on for the architect come out of his client's pockets. Of course the tradesman who connives at this sort of thing is as bad as the architect, and there are some who will not sacrifice their honour to their pocket, but there are many who will. I quite agree with Mr. Cossins in his remarks, and it certainly behoves the architects of this and other towns to do all they can to purge an otherwise honourable profession from abuses of this kind. The public, too, can protect themselves to a great extent by only employing architects and tradesmen who are above suspicion, and looking more into these matters than they do at present."

The writer, while urging the public to protect themselves by employing architects who are "above suspicion," says that some of those "who are considered at the top of the tree in their profession" do not scruple to accept bribes. How, then, if "An Ironfounder" be right, are the public to protect themselves? The letter is well answered by Messrs. Hassall & Singleton, of the Phœnix Foundry, Freeman-street, Birmingham, who write,—

"We read with much surprise the letter signed 'Ironfounder' under the above heading. Such a letter ought to have the writer's name; his signature is unfair to his brother ironfounders, as under it he insults his own trade, as well as a profession that all its members know is one of trust and confidence, and whose social and moral education is such as not to require advice from an ironfounder. We have done business with most, if not all, the architects

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of the town, and many others elsewhere. Our own experience has been the exact reverse of "Ironfounder." The bulk of the work in this district is done under the direction of architects of such standing and position that any proposition as to a commission would be such a direct insult that we should not like to be the ones to make it. On the contrary, if it is any consolation to any one building, we beg to testify that we have invariably found the architect studies his client's interests before his own, the builder's, or ironfounder's, and wisely so, too."

OPENING OF THE NEW MARKET-HOUSE AT DARWEN.

THE new market-house which has been erected by the corporation of Darwen was on the 21st ult. formally opened by Mr. F. W. Grafton, M.P., who, in the course of an address, congratulated the people of Darwen on the possession of so admirable a building. There were, he said, very few market towns in England of the dimensions of that borough that could boast of such a market-hall. He learned that it was originally intended to build a town-hall, but subsequently it was decided, and it seemed to him very judiciously, that they should have what was most essential, namely, a good market-hall. It was afterwards determined to add thereto suitable accommodation for the corporation and their officials, and they had in that building what seemed to him to be rooms admirably adapted for the transaction of the public business of the borough. In consequence of that arrangement a great saving of expense had been effected, That would commend itself to the ratepayers as having been a very wise and judicious step on the part of the corporation, and it indicated the great attention they had paid to the public interest. The accommodation now provided would suffice for many years to come, but it would not prevent the next generation, if they saw fit, carrying out a larger scheme. He noticed in passing through their borough and through other large towns that the buildings which were springing up were larger; that the cottages of olden time were either getting too small or too insignificant for the occupiers, and the probability was that another generation would desire to have a larger market and a larger town hall. He congratulated them upon the admirable way in which the work had been carried out, and he was sure they would join with him in giving a tribute of congratulation to Mr. Charles Bell, the architect, and also to the contractors, who had done their work well. Such buildings as that represented most important considerations with reference to the public welfare. He thought that the physical, material, and perhaps moral aspects of such buildings were worthy of consideration. That building would furnish ample accommodation for the sale of most of the fish, vegetables, fruit, and other things, and it would be for them to show their appreciation of the advantages they possessed by encouraging the traffic which would be carried on there.

The works have been in hand two years, and were the result of a competition (for which Mr. Waterhouse was the assessor) in 1879, when the first premiums for the Town-hall and Market-house were gained by Mr. Bell. The Town-hall is deferred for a time.

The market is spoken of as being excellently adapted to its purpose. It faces north and south, and consists of a central area, 130 × 80 ft., covered with an iron roof in two semi-circular spans, and supported only by three columns. It is glazed on the north side by Rendle's system, and covered with zinc on the south side. On the north are six butchers' shops opening into the market, lined with glazed bricks, the floors being of wood blocks. There are two main entrances to the market, north and south, enclosed by wrought-iron gates of elaborate design. There are also two other entrances past the fish stalls from the wholesale market. These, and the shops facing the square, are enclosed by Salmon & Barnes's wood shutters. There is a row of shops facing the market square, having walnut fronts, and each with a cellar below, reached by a circular iron staircase. The whole area of the market is cellared, and some difficulty was met with in the execution of the cellars, owing to the river Darwen passing across the site. It was, however, successfully and temporarily diverted, and solid retaining walls built, between which it now flows, the walls above being carried by iron girders, as is the whole of the market floor, with brick arches, and paved with Lowe's patent concrete. There are convenient fish and game stalls on the west side, fitted up in a very complete manner, and outside there is a wholesale market, open at each end to the market square and to School-street, and glazed like the general market. Above the south and east fronts are a spacious and well-arranged set of offices, appropriated to the use of the Corporation, comprising Council chamber, 50 ft. by 20 ft., Mayor's parlour, committee-room, and offices for the borough surveyor and gas and water engineer, with lavatories, &c. On an upper floor are a number of spare rooms, part being used by the caretaker. Over the main entrance is a turret of teak and lead for a clock. The offices are reached by a separate entrance and staircase from the square, and those on the south front by a corridor, supported on ornamental iron cantilevers, with handrail and iron panels, from the market wall.

The exterior is of Darwen stone, and is designed in a simple but effective Italian style to suit the material and surroundings. The interior is faced with the Silkstone Brick Company's buff bricks. Carving is introduced in the spandrels of main entrance arch, and in the coupled pilasters supporting main gable, in the tympanum of which are the town arms in bold relief; and in the panels of the centre window, over entrance, are the crests of the mayors in whose term of office the building was begun and completed, viz.: Aldermen Snape, J.P., and Green, J.P., all executed by Messrs. Gregg, of Darwen. The roofs are of green slates with red ridges. The ironwork of the basement was carried out by Messrs. Handyside, of Derby, and the roofs by Messrs. Goddard & Massey, of Nottingham. All the grates in offices are by Shorland, of Manchester. The general contractors were Messrs. Orrell & Son, of Over Darwen. Messrs. Haden & Co. supplied the zinc. Mr. A. D. Dawnay, M.I.C.E., acted as consulting engineer. The waterclosets, lavatories, and the whole of the sanitary appliances, were supplied and fixed by Mr. Stidder, of Southwark Bridge-road, London.

The total cost of the building has been 25,000*l.*, including the heavy and expensive foundations not originally contemplated.

Mr. Hobson Haigh efficiently acted as clerk of the works.

We published a view and plan of the building in vol. xl., p. 344 (March 19, 1881).

We may add that Messrs. Chubb & Son made the key intended for presentation to the Marquis of Hartington, who was to have opened the building, but was prevented doing so at the last moment. The key is of solid gold, and the letter H and the figures and coronet are enamelled in different colours, and four turquoises are placed at the four corners. The lock which secured the gates was an ornamental nickel-plated Chubb's patent padlock. The key was made to the order of the architect.

ARCHITECTS' ACTIONS.

STENT *v.* HARRISON.

THIS was an appeal (heard before the Lord Chief Justice and Lords Justices Lindley and Bowen on the 26th ult.) from the judgment of Mr. Justice Manisty in favour of the plaintiff at a trial which took place before his Lordship without a jury.

The plaintiff, who is an architect at Warminster, sued for commission upon the sale of Stainsbridge House, near Malmesbury. He alleged that he had brought the property to the notice of Mr. Edward Miles, who, in consequence, became the purchaser at the price of 6,500*l.* The claim was for a commission at the rate of 2½ per cent. on the first 5,000*l.*, and 1½ per cent. on the remaining 1,500*l.* The defendant, who is a member of the firm of Harrison, Beale, & Harrison, the well-known solicitors, was sole executor of the will of Mr. George Coote, to whom Stainsbridge House passed at the death of his brother, Captain Coote, in 1875. The house being in a good hunting country, and affording convenient hunting quarters, Mr. Coote not being a hunting man himself, instructed Messrs. Harrison & Co. to sell the house. The plaintiff, in August, 1875, received instructions from them to find a purchaser, Mr. Chubb, a solicitor at Malmesbury, having already received similar instructions. The house was advertised in the *Times* and other London papers, and the names of Messrs. Harrison & Co. alone appeared at the foot. Advertisements were also inserted in the local papers with the plantiff's name subscribed. On the 17th day of December, 1875, Colonel Miles went to Chubb's office and made an application on behalf of his brother, Mr. Edward Miles, with reference to a letting of Stainsbridge House. Mr. Chubb was away from his office, and the clerk, not knowing that the particulars with regard to the house were in Mr. Chubb's possession, wrote to tell Mr. Stent that Colonel Miles had called to ask about the house. On the 18th of December, before Stent had received Chubb's letter, Mr. Edward Miles went and looked at the house, and two days afterwards wrote to Stent that, seeing the house still advertised in the local papers, he had gone over it and wished to have particulars. Stent then wrote to Messrs. Harrison asking them to consider about letting the house. Ultimately the house was purchased in 1876. Stent had been paid for the advertisements which he had inserted, and it was contended on behalf of the appellant that no authority was given to Stent to subscribe his name to the advertisements. It was said to be the ordinary practice of house agents to advertise at their own expense, recouping themselves out of their commission.

The Lord Chief Justice said that actions like this must be very carefully watched. No doubt the work done by an agent entitling him to commission was often very slight, but if what he did was the determining point from which the purchase came to be made, that was enough. It might be no more than a wave of the hand effecting an introduction, but if that brought about the purchase, the agent's commission was payable. In the present case certainly very little had been done by the plaintiff. For himself, his Lordship thought he would not have come to the conclusion at which Mr. Justice Manisty had arrived, but there was one very material incident which made him think it would be wrong to reverse the judgment. It could not be denied that Mr. Miles was a witness who would naturally have no leaning in favour of either side, and, on the whole, his evidence, though it was not very satisfactory, was distinctly to the effect that Stent had brought about the purchase. If the matter had rested on the advertisements only, his Lordship would have said the defendant was entitled to succeed. Either Stent had no authority to put his name to the advertisements in the local papers, or, if he had, it was not through them that the purchase was brought about. It seemed that the application made to Chubb had wrongly been communicated to Stent by Chubb's clerk, but that was not material. If Stent did the determining act which led to the purchase, his commission was payable. His Lordship could not say that Mr. Justice Manisty was not justified in coming to the conclusion that something had passed between the plaintiff and Mr. Miles which had had the effect of bringing about the relation between Mr. Harrison and Mr. Miles which ultimately led to the purchase. He gave this judgment with reluctance, as he had personally a strong prejudice against these claims,—a prejudice which he hoped was not unfounded. He must reluctantly affirm the judgment appealed against.

Lords Justices Lindley and Bowen concurred.

PARR AND ANOTHER *v.* SMITH.

THIS was an action (tried on Monday last before Mr. Justice Manisty and a special jury) brought to recover a sum of 141*l.* for work done and services rendered as surveyors by the plaintiffs to the defendant in May, 1881.

This was the second hearing of the case, the first trial, which had resulted in a verdict for the plaintiffs for the full amount, having taken place before Lord Justice Cotton and a special jury, at Maidstone, last December. Subsequently a new trial had been ordered, on the ground that this verdict was against the weight of evidence, and also on the ground of misdirection. The defendant did not deny that he had employed the plantiffs to prepare sketches for two houses, with stable and coach-house, similar to the house of Mr. Waker, at Gravesend, but his case was that that they had agreed that the cost of the whole of the buildings should not exceed the limit of 1,200*l.* or thereabouts. The defendant's case was that the plans prepared by the plaintiffs had been useless to him, the lowest tender obtained, when they had been submitted to public tender, having amounted to as much as 2,638*l.* He paid 10*l.* 10*s.* into Court in respect of their cause of action, so far as he admitted the same in his statement of defence.

At the conclusion of the case,

His Lordship summed up, pointing out the greater probability of the defendant's case as to his having given the limit; and

The jury, without leaving the box, returned a verdict for the defence.

His Lordship thereupon gave judgment accordingly.

KEELING *v.* BARGEN.

IN this case (tried in the City of London Court, before Mr. Gibbons, Deputy Judge) the plaintiff was Mr. Bassett Keeling, architect, King's Arms-yard, who sued Mr. G. Bargen, restaurateur, Cullum-street, for 15*l.* 15*s.* for work and labour done in making a survey of premises in that street with a view to their being converted into a restaurant.

Mr. R. Cooke, restaurant keeper, deposed that the defendant came to his place early in March, when he stated that he liked it very much, and asked the name of the architect. Witness told him that it was Mr. Keeling, to whom he afterwards

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introduced the defendant for the purpose of the work now in dispute being done.

Mr. J. Marsden, clerk to the plaintiff, and Mr. Keeling, jun., proved the time occupied in making the survey; and Mr. E. J. Lowther, A.R.I.B.A., said the charge was a very fair and reasonable one.

The defence was that the plaintiff was never employed at all, and that the charge was excessive.

His Honour held that the defendant must have known perfectly well that the plaintiff was doing the work. Besides, when a first-class architect was employed, first-class prices must be paid. He accordingly found for the plaintiff, with costs.

BUILDING PATENTS.*

APPLICATIONS FOR LETTERS PATENT.

2,859. H. C. Tucker, Peterborough. Sash-weight attachments for sash-windows. June 17, 1882.

2,868. J. Thomas, Bangor. Apparatus for cutting or shaping stone. June 17, 1882.

2,882. W. S. Laycock, Sheffield. Self-acting window-blind apparatus. June 19, 1882.

2,935. A. Clark, London. Fire-proof screen for separating the stage from the auditorium of theatres, &c. June 20, 1882.

2,940. P. Beddoe, London. Apparatus for supplying disinfectant to water-closets, &c. June 21, 1882.

2,961. J. Harsant, London. Flushing water-closets, &c. June 22, 1882.

2,973. R. Boyle, London. Ventilators for buildings, &c. June 22, 1882.

NOTICES TO PROCEED

ave been given by the following applicants on he dates named:—

June 20, 1882.

746. F. F. Wintour, London. Ventilating apparatus. Feb. 16, 1882.

1,065. J. Wetherilt, London. Blinds or screens for windows. March 6, 1882.

2,420. W. S. Morton, Edinburgh. Materials for covering and decorating wall-surfaces, &c. May 23, 1882.

2,662. J. Davies, Kearsley Moor. Kilns for burning bricks, tiles, &c. June 7, 1882.

June 23, 1882.

850. J. Everard, Birmingham. Raising and owering Venetian and other blinds. Feb. 21, 1882.

888. H. Sutcliffe, Halifax. Water-closets, &c. Feb. 23, 1882.

889. J. C. Mewburn, London. Water-closets, &c. (com. by J. E. Boyle, Brooklyn, and H. Huber, New York, U.S.A.). Feb. 23, 1882.

914. S. S. Hellyer, London. Water-closets, urinals, &c. Feb. 25, 1882.

956. C. D. Abel, London. Ventilating apparatus (com. by C. Oehlmann, Berlin). Feb. 27, 1882.

2,540. G. F. James, London. Furnaces or fire-grates. May 27, 1882.

ABRIDGMENTS OF SPECIFICATIONS.

Published during the Week ending June 24, 1882.

4,949. W. F. Padwick, Redhill. Apparatus applicable to water cisterns, &c., for ensuring a supply of water during frost.

This is a conical vessel, with a series of tubes inside, which is attached to the cistern, and to which heat is applied. (*Pro. Pro.*) Nov. 11, 1881. Price 2d.

5,023. P. G. Messenger, Loughborough. Apparatus for charging the syphons of water-closets and urinals, &c.

In connexion with the syphon is a vertical pipe of a larger sectional area, which opens at the bottom by a small passage to the water in the cistern, and which has its top above the water level. In this is placed a float, which can be depressed by a lever thereby filling the bend of the syphon and setting up the syphonic action. Nov. 16, 1881. Price 6d.

5,033. B. O'Neill, London. Manufacture of artificial marble.

This is made of Portland cement, blue lias cement, cinder or coke dust, and marble dust, mixed with water, and a little borax added. This is run into moulds, and allowed to set, then dried and polished. The blocks are then enamelled by successive coats of varnish, after each of which they are baked. Nov. 17, 1881. Price 2d.

5,039. T. Beddoe, London. Apparatus for disinfecting water-closets, &c.

A globe is filled with the disinfecting liquid, whence the mixture passes to the closet. (*Pro. Pro.*) Nov. 17, 1881. Price 2d.

5,040. J. B. Petter, Yeovil. Stoves and fire-places.

These have a shell-shaped hood which contains the fuel, and the products of combustion pass into the axis of the shell, whence they are carried off by flues to the chimney. Nov. 17, 1881. Price 6d.

5,055. J. A. Davies, Ebbw Vale. Manufacture of bricks.

These are made from slag and clay. The slag is subjected to a stream of water before it becomes cold, pulverised, and then mixed with the clay. (*Pro. Pro.*) Nov. 18, 1881. Price 2d.

5,078. G. W. von Nawrocki, Berlin. Apparatus for diffusing liquids in the form of spray for cooling rooms, &c.

The liquid is forced out of a pipe in the form of spray by a small jet of steam. (Com. by P. Lochmann, Schkenditz, Germany.) (*Pro. Pro.*) Nov. 21, 1881. Price 2d.

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street, E.C.

THE METROPOLIS MANAGEMENT AND BUILDING ACTS AMENDMENT ACT.

SIR,—This Act confers greater powers on the Metropolitan Board to approve or refuse applications for new streets and buildings.

Is not this to the prejudice of the public? Would it not be more satisfactory for the Building Acts to be framed in definite terms, stating what may, and what may not, be done, without leaving many important points to the discretion of the Board, who may not be competent to judge, or, if they are, the time which would elapse from the application being made until the decision of the Board is quite uncertain, the applicant being entirely at the mercy of the Board, and often suffering loss through unnecessary delay. GEORGE EDWARDS.

TRAMWAYS.

SIR,—Tram-car propulsion by steam or electricity is now being discussed, and apparatus for accumulating a starting-force being devised. I would suggest the California endless-cable method of propulsion, which has certain advantages, amongst others, that at certain busy times of the day several passenger-cars can be hooked on to the brake-car, forming a train to accommodate any throng of passengers, instead of keeping them waiting, as under the present system. Of course, it necessitates a double line of rails for efficiency, the endless cable running in one direction in the one line, and in the opposite direction in the other line. The car or train is started by simply clamping on to the cable, which is always in motion at a certain speed, and stopped by unclamping and bringing to a stand-still with ordinary brake-power. The system is also in successful operation in Chicago, U.S.A. ALEX. BLACK.

SPINNING-ROOM VENTILATION.

SIR,—In the *Builder* of last week (p. 785), reference is made to Koerting's system of ventilating cotton-spinning establishments. The principle as described is as follows:—"The introduction of air which has passed through a column where a stream of water has been introduced by an appliance similar to a watering-pot." In a work recently published by the writer * (and which you did him the honour to favourably review), a description is given of a system of ventilation especially adapted for spinning-rooms, invented several years ago by M. Garlandat, of Paris. The principle of this invention, as recently and very successfully applied on the Continent, is similar in part to that described as Koerting's system. The air is drawn by means of a fan from a purpose-made brick well, in which is fixed a perforated grid covered with a layer of coke; and upon this, water of any desired temperature falls in a shower from a pipe having a rose termination. The air is drawn through the shower of water and layer of coke into the fan (which is on Farcot's double turbine principle), and then driven into a square box formed of sheet iron, in which is fixed another perforated grid or plate. Upon the surface of the latter is maintained a constant flow of water, the pressure of the air preventing the water from falling through the perforations. The air in its passage through the second flow of water becomes highly charged with aqueous vapour and entirely freed from suspended impurities and deleterious gases, and it is very effectual in preventing the atmosphere of the spinning-rooms from becoming dry and abnormally electrical. Both these latter conditions are fatal to [illegible] spinning operations. B[illegible] E., F.C.S.

* "Our Factor[illegible] London: E. & F. N[illegible] rehouses."

INDUSTRIAL DWELLINGS AND THE HOUSE-TAX.

SIR,—We are covering an estate at Shadwell with industrial dwellings, and have had a demand made on us for the house-tax (we pay all the rates and taxes), although each tenant is rated separately; his name is on the rate-book, and his rent is under 20*l.* per annum. We appealed to the Commissioners of the district, but they were against us.

In 1866 one of the industrial dwellings companies applied to the Treasury on this subject, and an order was made rendering such dwellings free from the tax; but the Commissioners ruled that this exemption does not apply to private individuals who may build these dwellings, but only to associations.

As this is very unjust, and will increase the weekly rental of each tenant by about 2*l.* per week, we shall be obliged if you will publish this letter in your columns; and if there are any of your readers who are in the same position we shall be glad if they will communicate with us, so that we may make a joint remonstrance to the Treasury.

Aldgate. ASHBY & HORNER.

ECCLESIASTICAL HISTORY.

SIR,—Amongst the wide circle of your readers there must be many who are learned in early ecclesiastical matters, and could give information which just now would be of much interest to many besides those who, like myself, are interested in the restoration of a small country church in Devonshire, in which some curious discoveries have been made.

Some of the points on which I seek information are:—

1. The relative position in early times of priory to abbey.

2. And of a small church-chapel being a dependency to either.

3. Did the service in abbeys, &c., follow the "use" of the diocese in which they were placed, or had they a peculiar use of their own, and did this also apply to the dependencies?

4. If this should be so, what was the "use" of Sherborne at its founding in 998?

5. Is there any known list of benefactions, or grants of land, &c., received by the bishopric, or subsequent abbey of Sherborne?

6. Was it not usual for small chapels, or shrines by the way side, to have affixed over the entrance the figure of the patron saint, of large size? And is there any special peculiarity about such in contradistinction to ordinary figures?

LESLIE I. McK.

TENDERS FROM BUILDERS.

SIR,—Will you, or any of your readers, kindly inform me, through your medium, if I can claim expenses, and to what extent, under the following circumstances?—

I and another builder were asked to tender for additions to a building, and each one to write out his own specifications, the plans being sent us. I sent in my tender, which proved to be the lowest, only I allowed for a slate (as directed), the other builder for a tile, roof. Under the circumstances they thought it best to get out their own specifications, and for us tender again, which I did, and was again the lowest, when they gave the job to my opponent, no clause being inserted in the specifications that they did not bind themselves to accept the lowest or any tender. JUSTICE.

DISINFECTANT.

SIR,—I should be much obliged if one of your readers could give me any information as to the best and cheapest way of making and employing perchloride of iron for disinfecting and precipitating sewage. GEORGE RUSSELL.

Middlesbrough Public Buildings.—At a special meeting of the Middlesbrough Town Council on the 21st ult., a letter was read from the architect of the proposed new public buildings, Mr. Hoskins, of Darlington, respecting the execution of the work. The Mayor (Alderman Archibald) presided. Mr. Hoskins said he would undertake to execute the work for 5 per cent. on his estimate, 68,000*l.*, or upon the ascertained estimate for all portions of the building other than the Town-hall portion. This offer the Sub-Building Committee recommended the Council to accept. Alderman Williams moved that tenders be taken for the public buildings as a whole, and also for the Town-hall separately, and the other portions of the buildings, and that no decision be come to until such tenders shall have been received. Councillor Scupham seconded, and the motion was carried by 14 votes to 8. At the close of the proceedings a petition signed by five members of the Council was handed to the Mayor requesting him to call another special meeting to rescind the resolution above agreed to.

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PROVINCIAL NEWS.

Carlisle.—A number of gentlemen are about to form a company for the purpose of erecting a Corn Exchange in Carlisle, and they have written asking whether the Corporation would, in such event, be willing to transfer the corn-market from the public street to the new Corn-Exchange, and if so upon what terms. Their letter was referred to the Tolls Committee for consideration. The suggested site of the proposed building is upon the Viaduct.

Silloth.—Last week Mr. Walker (general manager), Mr. Carswell (chief engineer), Mr. Boyd (resident engineer, Carlisle), Mr. Meik (engineer for the new dock) for the North British Railway Company; and Messrs. Scott and Middleton, contractors, assembled to view the site of the new dock, and to consider the feasibility of altering and increasing its shape and size. They finally agreed to increase its area from five and a quarter to six and a half acres, and to considerably contract the original width and greatly increase the length.

Tynemouth.—At a meeting of the Building Committee held on Tuesday, Mr. P. J. Messent in the chair, it was found that, in consequence of the numerous applications for space, the buildings comprising the winter garden, aquarium, terraces, arcades, skating-rink, &c., were not sufficiently large to meet the requirements of the coming Marine Exhibition. The committee, therefore, instructed the architect, Mr. W. Glover, Market-street, Newcastle, to prepare plans and advertise for tenders for the erection of additional buildings with a floor area of about 20,000 superficial feet, so arranging the new buildings that they could be still further increased should the exigencies of the exhibition require it.

Workington.—A new coal-drop has been completed in the Lonsdale Dock. It has the advantage of discharging ten tons each drop instead of three tons, as is the case with the old drops; but it is so constructed that with a simple arrangement of the back weights it can be adjusted to drop three or more tons. This arrangement can be executed in less than a minute. Mr. R. Hodgson, of Workington, and Messrs. Cowan and Sheldon, of Carlisle, had the contract, under the inspection of Mr. J. G. Dees, of Whitehaven. The work cost about 800*l.*

Weston-super-Mare.—Mr. E. T. Dew's new residence, now being erected upon the Esplanade, will be one of the finest buildings of its class in the immediate neighbourhood. The most of the position has been made by Messrs. Hans Price & Wooler, the architects. The type of architecture chosen by them is French Classic. It is built in its three principal façades wholly of Bath stone, the high Mansard roofs being covered with blue Welsh slates. The carving has been entrusted to Mr. Harry Hems, of Exeter, and is now being executed by trained members of that artist's staff, under the immediate direction of his foreman, Mr. James Steele. The general contractor for the work is Mr. S. Vowels, of Swiss-road, Weston-super-Mare.

Willenhall.—At a meeting of the Willenhall Local Board on the 19th ult., the Sewerage Committee, comprising the whole Board, presented a Report, in which it was stated that it would be absolutely necessary to acquire from the Earl of Lichfield thirty-five acres of land for the purpose of carrying out a system of sewerage for the town. A letter had been received from the London and North-Western Railway Company, complaining that their culverts were polluted by the sewage from Willenhall, and a notice had also been received from the Birmingham Town Council to the effect that two months hence a summons would be obtained from the Walsall County Court against the Board for allowing the river Tame to be polluted with sewage matter.—Mr. D. W. Lees, in moving the adoption of the report, referred to the pressure which had been put upon them by the Local Government Board for the last six or seven years to adopt a system of sewerage for the town. In 1877, a Sewerage Committee was formed to consider the sewerage question, and they came to the conclusion that the downward intermittent system would be the best, for land could be procured, and the present committee saw no reason to differ from that opinion. Land belonging to the Earl of Lichfield was inspected at the time, and it was considered as in every way suitable, but the negotiations for the purchase fell through. It was, however, now, in the face of the pressure from Birmingham, necessary that something should be done to sewer the town.—The Chairman (Mr. J. C. Tildesley) seconded the motion and after some discussion it was agreed to.

CHURCH-BUILDING NEWS.

Whitbeck.—The ancient church of Whitbeck, in Cumberland, has just undergone a thorough repair, and been re-opened for worship by the Bishop of Carlisle. The structure has been completely restored. The old roof has been replaced by a new one, the timbers being of pitch-pine stained and varnished, and covered with Buttermere slate. The west wall, bell-gable, and north wall have been taken down and rebuilt, the walling and dressing being of St. Bees stone. All the windows were also taken out and replaced with new glazed lead windows, cathedral glass being used. The high-backed pews and "three-decker" pulpit have given way to open pitch-pine benches and modern oak pulpit and reading-desk. The chancel has been altered, and the floor laid with encaustic tiles in place of the former stone flags, and a new oak altar-rail has been put in with iron standards; while a portion of the west end has been screened off for a vestry.

Penkridge.—The parish church of Penkridge, Staffordshire, is now in course of restoration. Since the beginning of May, when the work was commenced, the plaster has been removed from the north wall, the stone underneath being found in fairly good condition, but in places sadly injuried by the erection of the galleries. The woodwork of the seats was found in many places to be completely rotten, so that, if not now, it would have been necessary, sooner or later, to repair this portion of the fabric. At the same time the tower arch, which had been bricked up, has been pierced, displaying the west window, one of the beauties of the church. During the clearing out of the church one or two objects of interest have been found; some ancient encaustic tiles here and there, and three slabs marking the resting-places of those whose names are inscribed on them. One of these lies near the centre pillar of the nave on the south side, of which sufficient of the inscription is visible to mark the spot as the vault of the Egginton family of Redbaston, whose mural tablet may be seen over the south porch. Another is near the south-east pillar of the nave, and a third is under the site of the Teddesley pew, and marks the burial-place of Edward Littleton, late of Pileton, and Susanna his wife, who died respectively in 1704 and 1722. These two evidently lie in a vault which extends from under the west window of the south aisle, the entrance to which is distinguishable from the inside of the vault in which lie the bodies of the last Sir E. Littleton and Frances his wife, which was laid bare when the old woodwork was removed.

Sedgley.—A Vestry meeting has been held at Sedgley for the purpose of considering the advisability of carrying out a number of alterations and improvements at Sedgley parish church, which have been in contemplation for some time past. The Rev. William Griffiths, vicar, submitted plans showing that it was intended to pull down the side galleries, take down the present pews, and substitute new and more commodious seats; remove the organ from the western gallery, and put it near the chair seats; provide new heating-apparatus, after the position of reading-desk and pulpit, besides a number of other improvements. It was resolved to apply for a faculty to carry out the works. It was stated that 600*l.* would be required.

Clevedon.—It has been decided to reseat Christ Church with oak fittings, to introduce several stained-glass windows, and to make other improvements. The outlay will be provided for by subscription, and the whole will form a memorial to a former incumbent, the Rev. G. Weare Braikenridge. The architect engaged is Mr. E. H. Lingen Barker.

Brighton.—The new peal of six bells cast for the parish church of St. Peter's, Brighton, and suspended in the tower of that edifice by Messrs. Warner & Son, were, on St. Peter's day (29), rung for the first time. The dedication service was held on Thur-day, at noon, with a supplementary service in the evening. The cost of the new bells is 750*l.*, of which 243*l.* is wanted.

DISSENTING CHURCH-BUILDING NEWS.

Nottingham.—The foundation-stone of a new Congregational Church, at Park Hill, Nottingham, was laid on the 15th ult., by Mr. Arnold Morley, M.P. for the borough. The new church is planned to seat 460 adults on the ground-floor, and is arranged with a view to future enlargement. It consist of a nave and side aisles, divided by stone columns and arches, the latter supporting a clearstory. The style is fourteenth-century Gothic. The building is necessarily lighted mainly from the roof, and hence the side aisles are made narrow, and the clearstory becomes the most characteristic feature in the interior. The nave ceiling is arched, but low-pitched and boarded, and is broken by ornamental arched roof principals. The plastering of the walls is relieved by dressings and arches in stone and red brick. Externally, the materials used are Loughborough red bricks, with Mansfield and Ancaster stone dressings. In the rear of the church are a lecture-room for 150 persons, and two vestries. The contractors are Messrs. G. Bell & Son, of Nottingham, and the architect is Mr. J. Tait, of Leicester.

Congregational Church Extension.—It is stated that a gentleman who does not wish his name to transpire has offered, through the Jubilee Fund Committee, to give 1,000*l.* per annum for five years for Congregational Church extension in London, on condition that 9,000*l.* a year be raised in addition, or 2,000*l.* per annum for five years, if 18,000*l.* additional be raised; or to supplement in the same proportion any sum raised for new work in London less than the sums above mentioned; and, further, to give 100*l.* for every Congregational Hall, up to twenty, erected in London.

Wigton.—Five memorial stones of a new Wesleyan chapel and schoolroom here have been laid. The site which has been bought is 96 ft. by 54 ft. in width. It has been laid out so that the chapel stands in front, facing the street, and behind are the schools, class-room, and vestry. The interior space of the chapel itself will be 60 ft. in length by 32 ft. 6 in. in width, and it is estimated to seat about 300 worshippers, but this space can be added to if occasion requires, by taking down a screen which will be put up to separate the school from the chapel. The contractor for the joiner's work is Mr. William Foster, of Wigton, Mr. Jos. Moore, of Wigton, taking the builder's portion. Mr. Ranger, of London, is the architect.

Keith (*N.B.*).—On the 22nd of June the foundation-stone of a new Episcopal Church in course of erection at Keith was formally laid by Miss Gordon Duff, of Drummuir. The church is to be in the old Scottish Gothic style of architecture, and is designed by Mr. Alex. Ross, architect, Inverness. The building is intended to accommodate 300 persons, and will cost about 2,400*l.* On plan it consists of nave, tower, chancel, organ-chamber, vestry, and heating-chamber. The tower is prepared for a peal of bells.

Books.

Art in Everything. By HENRY FAWCETT. London: Houlston & Sons. 1882.

THIS small volume consists of essays originally published in the *Churchman's Shilling Magazine.* We fear the author is a good deal behind the age. In his preface we meet again the old superstition, which we really thought was dead by this time, that the stems and branches of trees suggested the Gothic shaft and vaulting; and the rest of the references to architecture show about the degree of acquaintance with the subject which might have been expected from such a commencement. In regard to subjects unconnected with architecture there are remarks which may have served to suggest passing reflections to the readers of the periodical in which they appeared, but we certainly cannot think them worth republishing.

VARIORUM.

"TRANSACTIONS of the National Association for the Promotion of Social Science. Dublin Meeting, 1881. London: Longmans, Green, & Co. 1882." This volume will be found to contain a large amount of information and opinion in respect of the various subjects treated of by the several departments of the Association. The objection we have to take is that the publication is delayed too long. Nearly

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eight months have elapsed since the Dublin meeting, the proceedings of which it records, so that the interest felt in it is greatly weakened. Two or three months would seem to be ample time in which to produce it.——Messrs. Longmans, Green, & Co. announce a second edition of "Outlines of the Life of Shakespeare," by J. O. Halliwell-Phillipps, F.R.S. The object of this work is to furnish the reader, in a plainly-written narrative, with details of all that is really known respecting the life of Shakspeare: random conjectures and æsthetic fancies being excluded. —— Mr. Michael Reynolds's long-promised book on the subject of Continuous Railway Brakes will be published this week by Messrs. Crosby Lockwood & Co., of Stationer's-hall-court.—— "Fun's Comical Creatures," drawn by Ernest Griset (*Fun* Office, Fleet-street), shows some really comical creatures, accompanied by corresponding letterpress.——The *Oracle* gives the following lively sketch of the life of James Wyatt, the architect:—James Wyatt was born at Burton, in Staffordshire, about 1743, of a respectable family. Having been brought to the notice of Lord Bagot, then ambassador to Rome, he accompanied that nobleman to Italy, where he had the advantages of such studies that on his return to his native country he found himself without a professional rival. He was often heard to say that he had with his own hand measured every part of the dome of St. Peter, and that, too, at the risk of his life, lying on his back on a ladder swung horizontally, without cradle or side rail, over a void of 300 ft. At Venice he was the pupil for two years of Viscentini, architect and painter: some of his architectural paintings executed at this period were considered to equal any by Panini. At the age of twenty, Wyatt returned to London, where he was employed to build the Pantheon in Oxford-street, which was then considered a model of symmetry and tasteful decoration. Never, perhaps, was so high a reputation in the arts obtained by a first effort. Applications now poured in on Wyatt from all parts of the United Kingdom and from the Continent. The Empress of Russia gave her ambassador *carte blanche* to induce Wyatt to settle at St. Petersburg, but, unfortunately for English architectural antiquities, Wyatt declined the offer of the munificent Catherine. On the death of Sir William Chambers he was appointed Surveyor General to the Board of Works, which was followed by appointments to almost all the important offices connected with his profession in the Government Departments, and, a dispute having arisen in the Royal Academy, which induced Mr. West to resign the president's chair, Wyatt obeyed the King's command to fill the vacant office, which, however, he restored to Mr. West the following year. Among his chief works were a palace at Kew, Fonthill Abbey, Bulstrode, Doddington Hall, Hanworth Church, alterations in the old House of Lords, and in Henry VII.'s Chapel at Windsor. Although educated as what was then known as a Classic or "Roman" architect," and making his successful *début* in England in that style of art, yet he afterwards revived in this country the long-neglected "beauties of Gothic Architecture," as far as he could appreciate them, which was not very far—witness the splendid stained glass broken out of the windows of Salisbury Cathedral, and flung by the cartload into the river, and replaced by cold, bald, staring white glass (a deed which Thomas Cromwell with his spoliators or Oliver Cromwell with his Ironsides might have had the credit of), the tombs torn out of their appropriate places and arranged symmetrically down the centre of the nave; witness again lovely Hurstmonceux Castle, or rather the shell of it, for that is all the zeal and bad taste of Mr. Wyatt has left—Grinling Gibbons' carvings, coloured glass, in fact, all the interior, gone; witness, indeed, the "eminent one's" *chef-d'œuvre*, that gingerbread Gothic conglomeration of unfulfilled architectural promises at Fonthill. Mr. Wyatt died on 3rd September, 1813, from the effects of a fall from a carriage. The Kew Palace has been pulled down, so has Fonthill Abbey, and the old House of Lords burnt.

Royal Albert Hall. — Madame Christine Nilsson will sing in an Opera and Ballad Concert to be given here this, Saturday afternoon, July 1st, as well as Miss Patti Winter, Madame Trebelli, Mr. Maas, Mr Maybrick, and others.

Miscellanea.

Association of Municipal and Sanitary Engineers and Surveyors. — The annual meeting of the municipal and sanitary engineers of the Midland district was held on the 17th ult., at Goole, when Mr. E. Pritchard, ex-president, of London and Birmingham, presided at the meeting, held at the Lowther Hotel. Mr. J. H. Taylor, borough surveyor, Barnsley, read a paper on "Extraordinary Traffic on Highways by Traction Engines, and the Loads they draw." A paper, prepared by Mr. James Hall, borough surveyor, Stockton, on the relative cost of macadamised roads and paved streets, was next read, in Mr. Hall's absence, by Mr. Tudor (Goole), after which the two papers were discussed by Mr. Wheeler (Boston), Mr. Tudor, Mr. Cross (Dewsbury), Mr. Escott (Halifax), Mr. Gamble (Grantham), Mr. Whitlow (Sowerby Bridge), and the chairman. Mr. Taylor having replied, a vote of thanks was accorded to those who prepared the papers. The members of the association present then visited and inspected the hydraulic coal-boat lift, the North-Eastern Railway hydraulic swing bridge over the river Ouse, and the new dock, and afterwards dined together.

Cost of the Electric Light.—In reply to inquiries, we have been favoured by Messrs. Samuel Brothers, of Ludgate-hill, with some details respecting the electric light as employed upon their establishment. The dynamo machine is worked by an Otto gas engine of 12-horse power, which is, however, far in excess of what is required for the existing lights, and will be amply sufficient for a number of incandescent lamps which are about to be fitted up in the counting-house, private office, and fitting-rooms. The engine and lamps require no skilled superintendence, and are attended to by the head porter. There are altogether twenty Jablochkoff arc lights, five of which are in the front, and the remainder are employed to light up 4,000 square feet of space inside. Each lamp has an illuminating power of 378 candles, equal to thirty-five ordinary gas burners, as verified by the scientific staff of the Metropolitan Board of Works. The Jablochkoff "candles" cost for each lamp one penny per hour, and the gas consumed by the Otto engine costs also one penny per lamp per hour. The total expense per annum is 150*l.*, the lighting of the premises averaging three hours each night.—*Warehousemen and Drapers' Trade Journal.*

The Electric Sun Lamp.—The "Lampe-Soleil" of M. Clerc and M. Bureau, of Brussels, was exhibited on Saturday, in the vaults of the Royal Exchange. The peculiarity of this lamp is that it combines the principles of the arc and the incandescent lights. Into a small block of marble two carbons are inserted at an angle of 40 degrees, and the electric arc is produced at the extremities of these carbons, which are concealed in a space formed by the hollowing ont of the under side of the block. The arc light makes the marble incandescent, reducing it to chalk, and the effect of the combination is a steady, sun-like illumination, radiating from a considerable surface, and singularly free from the unpleasant quality of casting strong shadows. The carbons fall by gravitation, and therefore no machinery is required to regulate them as they are consumed. One advantage claimed for the Lampe-Soleil "is that, if the current be stopped, the lamp is not at once extinguished, the incandescent marble giving out light for a few minutes by itself." M. Garnier, architect of the Paris Opera House, in the *foyer* of which the Lampe-Soleil has been used, says, "C'est, selon moi, la plus belle lumière qui puisse être employée pour l'éclairage des œuvres d'art et des galeries de luxe."

A Memorial of the late Dean of York.—There has just been erected in the east aisle of the south transept of York Minster a monument in honour of Dr. Duncombe, Dean of York from 1858 to 1880. It is of Caen stone, and is in the Decorated style of architecture. The effigy of the late Dean, of white marble, has been executed by Mr. Boehm.

Greenock House Joiners' Wages.—The Greenock house-joiners are at present agitating for an increase of ½d. per hour on their rate of wages (6½d. per hour). It is stated that the increase has already been granted by several of the masters.

Royal Academy. — The President and Council have issued cards of invitation for Wednesday, the 5th of July.

School of Science and Mines.—Mr. Mundella, M.P., delivered in the lecture-theatre at South Kensington Museum, on Saturday, the awards gained by the students of the Normal School of Science and Royal School of Mines since its establishment in its present form. Professor Huxley, dean of the new institution, sketched the history of the two schools, which were united and re-organised, less than a year ago, to form the present institution. The result of the change would be greater efficiency. It was, he remarked, lamentable to find how the ordinary methods of education in what was called literature, but often was not literature, pretended to teach science, but really impeded it. They accustomed people so largely to take statements on credit, that the persons taught could not see for themselves. The institution had already 198 students, and might be expected to reach a vigorous manhood. Mr. Mundella, having distributed the awards, expressed gratification at the admirable usefulness of the school. Commenting on the need for science-teaching, he said that England had been far behind her neighbours in this matter, and he was glad that our manufacturers were beginning to realise the fact. The efforts and lavish expenditure of Continental countries,—France and Germany especially,—within the last ten years were astonishing. The Royal Commission on Technical Education would probably make not only an interesting but a startling report; but he did not fear that England would be unable to meet the circumstances of the case, and to continue holding her own with regard to industrial progress. Less than thirty years ago there was no systematic scientific instruction in the country; but now 1,500 teachers and 70,000 students were receiving grants from the Science and Art Department. Two hundred teachers visited South Kensington yearly at the expense of the Government and for educational purposes, and in addition there were 200 students in this institution, many of whom had chosen the teaching profession. Col. Donnelly and General Martin also took part in the proceedings.

The Walker Art Gallery, Liverpool.—Besides the permanent collection of pictures, there are at present three additional exhibitions to be seen, each of great interest, in this gallery. The latest of these comprises fifty-three sketches and drawings by J. M. W. Turner, R.A., which have been lent for exhibition for the instruction of art students by the trustees of the National Gallery. In another room are some hundreds of sketches and drawings by the late W. G. Herdman, illustrative of old Liverpool, and in a third room are exhibited the designs of thirty-nine artists and sculptors who have competed for the bas-reliefs for the panels of St. George's Hall. Touching the latter, "A Competitor" writes to the *Daily Post* expressing satisfaction at the announcement that the committee who have the matter in hand are about to ask the assistance of an artist of the highest standing to aid them in awarding the prizes. It is said that several of the designs or models have been sent in in total disregard of the prescribed scale or size published by the council in their printed instructions. This was "one-fourth of the full size of the carving." These designs, it is urged by "A Competitor," ought never to have been received, and he urges their elimination at once.

Borough Surveyorship, Blackburn.—At a meeting of the General Purposes Committee of the Blackburn Corporation on the 22nd ult., Mr. J. B. M'Callum, C.E., Borough Surveyor of Stafford, was appointed to the borough surveyorship of Blackburn, vacant through the resignation of Mr. Bryan, who has become engineer to the East London Water Company. Mr. M'Callum has filled his present post for six years, and was previously engaged as assistant to the borough and water engineer of Liverpool. The salary of the post conferred upon him is 500*l.* per annum. The chief works carried out at Stafford during his surveyorship have been the construction of the weir at Stafford Mill and the Walton Walk; the cleansing and deepening of the river Sowe; the erection of the Broad Eye Bridge; the erection of Meadow Bridge; the erection of the Wragge Museum, Free Library and Public Reading-room, and School of Art; the preparation of plans for the main drainage of the borough, and the partial carrying out of the same; the preparation of the scheme for supplying the town with water from Sherbrook (Cannock Chase); and the laying out of Coton Field and forming roads.

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Proposed Dock Extension at Burntisland.—Increased dock accommodation is being demanded here, and several sites for a new dock have been spoken of, among them the bay behind Rossend, the present tidal harbour, and the ballast depot beyond Cromwell Dyke,—the last named receiving most favour, and forming the subject of a plan by Messrs. Meek, C.E., Edinburgh, the engineers of the existing dock. A somewhat novel proposal has just been put into shape by the resident harbour engineer, Mr. R. Henderson. Mr. Henderson has prepared a plan of a dock entirely apart from the present harbour, and situated on the east side of the town, where about 24 ft. or 25 ft. water might be had. Its chief features are as follow:—The entrance would be found off the point of the Lamerlaws, and the last outer pier founded on the Henchboy Rock, where the depth of water at ebb tide is about 1½ fathom. An entrance basin stretches 800 ft., with a width at the pier-heads of 250 ft. From this basin steamers could be admitted into the dock at almost all states of the tide, by a lock 400 ft. long. The area of the dock would be 11½ acres, affording ample space for four hydraulic coal-loading hoists, besides a large amount of quay room for import traffic. Estimates of the cost of the undertaking have not yet been accurately calculated, but it is thought that the whole works and equipment could be carried out for 300,000*l*.

The Society of Arts.—On Wednesday afternoon the one hundred and twenty-eighth annual meeting of the Society of Arts took place at the rooms of the society, John-street, Adelphi, when Sir Frederick Bramwell, the chairman of the council, read his annual address. The chairman said that of all the subjects with which the public mind has been lately much exercised, perhaps none (of a non-political character) had given rise to so much controversy as the Channel Tunnel; and the importance of ready inter-communication of nations in its bearing upon art, manufactures, and commerce will, the council believe, have amply justified their invitation to Sir Edward Watkin to open a discussion on the subject before the society. Electricity in all its forms, especially that of street lighting, had engaged the special attention of the society. The number of members of the society still continued to increase. During the year 273 members had been removed from their list by death or resignation. In the same period 373 had been elected. There was, therefore, an increase of 100. The total number of life and subscribing members and institutions in union which subscribe to the society from their own funds was 3,429.

The Coffee Tavern Movement.—Lord Zetland has just erected a new coffee tavern at Richmond, Yorkshire. Some three or four years since, Lady Zetland, who takes a great interest in the movement, determined to try the experiment on a small scale, and one of a new range of shops then being built was taken for the purpose, and shortly afterwards opened. The result proved that it was widely appreciated, and on market days the place has been generally uncomfortably crowded, so much so that about a year ago his Lordship determined to erect a building specially designed and arranged for a coffee tavern on a larger scale. The new premises have just been opened; they are carried out in a style of architecture which harmonises with the quaint and picturesque old Yorkshire town, and stand prominently facing the broad open space in King-street. Messrs. Oliver & Leeson, Newcastle-on-Tyne, were the architects for the former as well as for the present buildings.

Dartford.—The foundation-stone of a new Introductory Congregational Chapel was laid at West-hill, Dartford, on the 21st ult. The new building is planned to seat about 300 persons, with vestry, kitchen, and infants' classroom, and will be built of red brick, with Bath stone dressings, covered with tiles. The roof timbers and fittings are of pitch pine. The estimated cost of the building is upwards of 2,000*l*. The works are being executed by Messrs. Naylar & Son, of Rochester, from the designs of Mr. John Sulman, architect, of No. 1, Furnival's Inn, London.

Sevenoaks.—In this favourite and increasing neighbourhood, a beautiful estate, overlooking Kippington Park, has just been opened up for building purposes. The contractor for the roads and drains was Mr. W. J. Botterill, Cannon-street, London; and the surveyor, Mr. T. Potter, Sevenoaks.

A Self-winding Clock.—The *Journal of the Society of Arts* says:—"In September last a new perpetual clock was put up at the Gare du Nord, Brussels, in such a position as to be fully exposed to the influence of wind and weather; and, although it has not since been touched, it has continued to keep good time ever since. The weight is kept constantly wound up by a fan placed in a chimney. As soon as it approaches the extreme height of its course, it actuates a break, which stops the fan; and the greater the tendency of the fan to revolve, so much the more strongly does the brake act to prevent it. A simple pawl arrangement prevents a down-draught from exerting any effect. There is no necessity for a fire, as the natural draught of a chimney or pipe is sufficient; and if the clock is placed out of doors, all that is required is to place it above a pipe, 16 ft. or 20 ft. high. The clock is made to work for twenty-four hours after being wound up, so as to provide for any temporary stoppage; but by the addition of a wheel or two it may be made to go for eight days after cessation of winding. The inventor, M. Auguste Dardenne, a native of Belgium, showed his original model at the Paris Exhibition of 1878, but has since considerably improved upon it.

Kettering.—The new public baths have been opened. The swimming-bath is 80 yards long by 15 yards broad, and varies in depth from 3 ft. to 6 ft. 6 in. It is lined entirely with blue brick, and is faced with asphalte. The water-supply is continuous, a stream constantly passing through the bath. The water is filtered before entering the bath. At the north end is a large dressing-shed, and closets, &c., and at the south end are a dwelling-house for the overlooker, a large refreshment-room, and private dressing-boxes for season-ticket holders. The area of ground is enclosed by a fence 8 ft. high. The absence of any river near Kettering makes this bath a great boon to the public, who are using it very freely. The contract for the works was taken by Mr. Barlow, builder, of Rothwell, who has carried them out under the superintendence of Mr. R. W. Johnson, architect and surveyor, of Kettering and Melton-Mowbray. The total outlay is about 1,500*l*.

Francois Guigon, a Swiss landscape painter of some note, died early in June, at Geneva, where, seventy-five years ago, he was born. He belonged to the school of Genevan painters which, under the influence of Rousseau, Horace Benedict, Saussure, and Toepffer, sought its inspiration in the history of the Helvetic Confederation and in the grand scenery of the Alps.

South Kensington.—A two-light Munich window by Messrs. Mayer & Co. has just been placed in St. Mary's Church, Boltons, Kensington. It represents Christ consoling the women and the Angel at the Sepulchre, illustrating the text "Weeping may endure for a night, but joy cometh in the morning."—Psalm xxx. 5.

The Sculptor's Libel Case.—The remarkable case of Belt *v.* Lawes, which has for some days been engaging the public interest, was on Wednesday last adjourned, owing to exigencies of circuit business, to the 3rd of November next. The plaintiff's case is not yet concluded.

St. Paul's, Hammersmith.—The foundation stone of the new parish church for Hammersmith will be laid this Saturday, July 1, by Prince Leopold.

A Gold Medal has been awarded to Messrs. F. W. Reynolds & Co. for their exhibit of woodworking machinery at the New Zealand Exhibition, Christchurch.

New Zealand Exhibition, 1882.—A gold medal has been awarded to Messrs. Elliman, Sons, & Co., of Slough, for their royal embrocation for horses and cattle.

TENDERS

For industrial dwellings, Maroon-street, Stepney, for Mr. George Doudney. Mr. W. H. Scrymgour, architect. Quantities by the architect:—

James Crabb	£5,500 0 0
Martin Wells & Co.	5,390 0 0
William Downs	5,287 0 0
Dunford & Langham	5,197 0 0
Mark Manley	4,985 0 0
John Anley	4,880 0 0
William Watson (accepted)	4,564 0 0

* For the erection of a villa residence, Trinity-road, Tulse Hill, for Mr. Robert Milnes. Mr. W. H. Milnes, architect, 5, Westminster-chambers, Victoria-street. Quantities by Mr. H. Lovegrove, 26, Budge-row:—
Holliday & Greenwood, Brixton (accepted) £1,600 0 0

For Broxbourne Sewerage Works. Messrs. Smith & Austin, engineers:—
W. J. Botterill, London (accepted).

For drainage of Saltley College, Birmingham. Mr. E. Pritchard, engineer, 27, Great George-street, Westminster:—

Jones & Fitzmaurice, Birmingham	£585 0 0
Currall & Lewis, Birmingham	411 0 0
Hennington & Wallis, Birmingham	405 0 0
Charles Cotterill, King's Heath	390 0 0
W. Robbins, Warwick	386 0 0
G. Law, Kidderminster	370 0 0
J. M. Smith, Westminster	350 0 0
W. Sapcote & Sons, Birmingham	349 0 0
John Fell, Leamington (accepted)	345 0 0

For repairs, St. Paul's Industrial School, Mile End. Messrs. A. & C. Harston, architects, 15, Leadenhall-street:—
J. H. Johnson, Limehouse (accepted). £290 0 0

For warming and ventilating, by their new hydro-caloric apparatus, the new Congregational Church and Schools, Ossett, Yorkshire. Mr. J. P. Pritchett, Darlington, architect:—
J. Weeks & Co., Chelsea £360 0 0

For erection of class-rooms to the St. John's National Schools, Westminster. H. W. Budd, architect, 47, Vincent-square:—
Lamble (accepted) £794 0 0

For repairs to the Tredegar Arms, for the Westminster Brewery Co., Bow. H. W. Budd, architect:—

Lamble	£138 0 0
King & Son	127 0 0
Hoare & Son	118 0 0
Pemberton	84 11 0

For alterations at the Enterprise, Long Acre. H. W. Budd, architect:—

Lamble	£130 0 0
Pemberton	122 0 0
King & Son	117 0 0
Warne	108 0 0

For certain works at Nos. 9 and 10, Brunswick-street, Blackfriars-road. Mr. Charles Teague, architect:—

Artus	£120 0 0
Dorling	94 0 0
Gilbert (accepted)	74 0 0

For alterations, new billiard-room, &c., 17, Cumberland, terrace, Regent's Park. Mr. Arthur Vernon, architect Great George-street, Westminster, and High Wycombe:—

Goodwin	£1,622 14 0
Holland & Hannen	1,364 0 0
Perkins (accepted)	1,132 0 0

For new conservatory at 17, Cumberland-terrace. Mr. Arthur Vernon, architect:—

Holland & Hannen	313 0 0
Goodwin	307 0 0
Perkins	220 0 0

For alterations, &c., to 1½, Park-place-villas, Maida-hill. Mr. J. Farrer, architect:—

Foxeley	£110 0 0
Smith	89 0 0
J. Harper	87 10 0
J. S. King (accepted)	79 0 0

For five houses in St. Alban's-crescent, Green-lanes, N., for Mr. Miles. Mr. J. Farrer, architect:—

J. S. King	£2,130 0 0
Wilkinson Bros.	1,393 0 0

For Congregational Sunday Schools, &c., Epsom. Mr. W. D. Church, architect, 12, South-place, Finsbury:—

Dove Bros. (accepted)	£2,100 0 0*

* Godalming stone facing extra, £125.

For building workshop at the rear of No. 23, Kingsland-road, for Mr. P. Zerfass. Mr. W. D. Church, architect, No. 12, South-place, Finsbury:—
Sabey Son (accepted) £595 0 0

For painting, cleaning, and other works, at the Infirmary, Marloes-road, Kensington, for the Guardians of St. Mary Abbotts, Kensington. Messrs. A. & C. Harston, architects:—

Welchman & Wise	£767 0 0 !
Nightingale	650 0 0
Holland	485 0 0
Wythe	424 6 0
Reeves	405 4 0
Mears	396 0 0
Derby	340 0 0
Cowland	325 0 0
Swain	299 0 0
Lavers	290 0 0
Burton	274 19 5½
Sheerman & Son (accepted)	218 12 0 !

For alterations and additions to The Poplars, Hoddesdon, Herts, for Mr. T. Daw. Mr. C. R. Lovejoy, architect Watford, Herts:—

W. Hampton, Hoddesdon	£498 0 0
J. Tongman, Watford	490 0 0
Scales & Norris, Hertford (accepted)	485 0 0

For alterations to villa residence, Bath-road, Swindon. Mr. W. H. Read, architect:—
Henley (accepted).

For the erection of buildings for disinfecting apparatus, at the hospital, for the Swindon Old Town and Swindon New Town Local Boards. Mr. W. H. Read, architect:—

Barrett	£134 7 0
Henley	125 10 0
Wiltshire	118 0 0
Pettifer, Swindon (accepted)	110 0 0

For the erection of house, Morris-street, Even Swindon, for Mr. E. Caudwell. Mr. W. H. Read, architect:—

Wiltshire	£512 10 0
Barrett	509 5 0
Henley, Swindon (accepted)	455 9 0

For the erection of villa residence, Bath-road, Swindon, for the Misses Cowell. Mr. W. H. Read, architect:—
Wiltshire, Swindon (accepted) £999 0 0

For addition to house, No. 17, Regent-street, New Swindon, for the Hon. and Rt. Rev. Dr. Clifford. Mr. W. H. Read, architect:—
Wiltshire, Swindon (accepted).

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For two houses and shops to be built at Haverstock-hill, for Miss Crump. Mr. T. H. Watson, architect, 9, Nottingham-place. Quantities supplied:—

Wheeler	£2,915	0	0
Howard	2,898	0	0
Powter	2,860	0	0
Martin & Goddard	2,800	0	0
Redman	2,798	0	0
Jackson & Todd	2,700	0	0
Jones & Co.	2,690	0	0
Fowler	2,648	0	0
Kearley	2,548	0	0
Drew	2,500	0	0
Milnes	2,500	0	0
Manley	2,496	0	0
Boden	2,467	0	0
Niblett	2,447	0	0
Shurmur	2,442	0	0
Tyerman	2,417	0	0
Carpenter & Poole	2,400	0	0
Steed Bros.	2,395	0	0
Sharman	2,303	0	0
Parker	2,297	0	0
J. King	2,295	0	0
J. Parish	2,284	0	0
Halladin	2,180	0	0
Evans	2,119	0	0

For building four additional cottages to the Bookbinders' Provident Asylum in Ball's Pond-road, Islington, for the Bookbinders' Pension and Asylum Society. Mr. Mark W. King, architect:—

Patrick & Son	£1,580	0	0
Ramsey	1,472	0	0
Mattock Bros.	1,453	0	0
Brass	1,435	0	0
Nightingale	1,393	0	0
Alder	1,364	0	0
Kilby	1,267	0	0

For the erection of a branch dispensary at Ladywood, Birmingham. Messrs. Payne & Talbot, Birmingham, architects. Quantities supplied by Mr. William Wykes, Birmingham:—

S. Taylor	£3,193	0	0
W. Parton	3,130	0	0
Sapcote & Son	3,005	0	0
J. Garlick	2,999	0	0
Surman & Sons	2,987	0	0
W. & J. Webb	2,970	0	0
Jeffery & Son	2,886	0	0
W. Robinson	2,872	0	0
J. Bowen	2,859	0	0
B. N. Smith	2,834	0	0
Barnsley & Sons	2,815	0	0
W. T. Bennett (accepted)	2,799	0	0

For the erection of a new Wesleyan Chapel at Clevedon, Somerset. Mr. Herbert J. Jones, architect, Bristol:—

Harris & Shapcott, Bridgewater	£4,332	0	0
J. Davis, Bristol	4,160	0	0
Brock & Bruce, Bristol	4,100	0	0
Geo. Humphreys, Bristol	3,986	9	0
Wilkins & Sons, Bristol	3,945	0	0
Eastabrook & Son, Bristol	3,790	0	0
Cowlin & Sons, Bristol	3,675	0	0
W. Veals, Bristol	3,641	0	0
Lewis & Edbrooke, Bristol	3,500	0	0
Wm. Church, Bristol	3,499	0	0
W. A. Green, Clevedon	3,185	0	0

For the erection of a Wesleyan Minister's residence at Clevedon, Somerset. Mr. Herbert J. Jones, architect, Bristol:—

J. Davis, Bristol	£1,390	0	0
Harris & Shapcott, Bridgewater	1,327	19	0
Brock & Bruce, Bristol	1,290	0	0
Geo. Humphreys, Bristol	1,245	0	0
Eastabrook & Sons, Bristol	1,173	0	0
Cowlin & Sons, Bristol	1,147	0	0
W. Veals, Bristol	1,134	0	0
Lewis & Edbrooke, Bristol	1,111	0	0
Wilkins & Sons, Bristol	1,080	0	0
Wm. Church, Bristol	1,075	0	0
W. A. Green, Clevedon	992	9	5

For extension of outfall sewer, and draining and laying out four acres of filtering ground, Horsham. Messrs. Gotto & Beesley, engineers:—

Buxton	£3,387	0	0
Redford	2,490	0	0
Etheridge Bros.	1,836	0	0
Dickson	1,755	0	0
Strachan & Co.	1,690	0	0
Rayner	1,579	0	0
Ford & Everett (accepted)	1,478	0	0

For painting D-street schools, Queen's Park, for the London School Board:—

Wall Bros.	£432	0	0
J. H. Petchey	420	9	0
W. Oldrey	420	0	0

For painting Marlborough-road Board School:—

Pardoe & Sons	£394	10	0
W. Oldrey	363	0	0
W. Hornett	322	15	6
C. Wall	306	0	0
Stimpson & Co.	293	0	0

For painting Steven-street Board School:—

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The Builder.

VOL. XLIII. No. 2067. SATURDAY, JULY 8, 1882.

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An Additional Chapter to the Story of the Government Offices.

THE advent of a First Commissioner of Works new to office and legitimately ambitious to do something in his own sphere of liberal enterprise, the fact that most of the measures affecting the moral and pecuniary interests of Great Britain are now smuggled through a jaded House of Commons at the fag-end of a sitting devoted to the twin subjects of Irish and Egyptian independence, the general reluctance felt by men of refined aspirations and cultivated tastes to mix in the turmoil of rough representative assemblies, have afforded an opportunity for adding another chapter to the ludicrous story of the extension and concentration of the Public Offices, with a view to scientific method in the system of their design and to rigorous economy in its execution. Another scheme is about to be approved. Another Bill,—the Public Offices Site Bill,—is on the verge of being sent up to the House of Lords, having for its justification an ostensible plea of concentration and economy, but really being, when viewed in conjunction with facts most carefully concealed from public notice, as extravagant a piece of official "management" as was ever concocted by a First Commissioner of Works, or blindly condoned by a Select Parliamentary Committee. As for the latter, we have already noted the ease with which one set of honourable members seated in Committee will undo what another set, similarly seated years and cycles of years previously, recommended, attempted, or did. We must ask our readers to go back to our volume for 1877, where, at page 852, the "Story of the Government Offices" from 1837 to 1877 is given in full, and where at pages 898 and 899 the report of the Select Committee which sat in 1877 "to inquire into the annual expenditure on public offices and buildings, and to see whether the adoption of a more comprehensive plan for the extension and improvement of the public buildings would not be more economical and advantageous than the present system," was criticised, and the evidence of witnesses it examined was exposed. We invoked the attention of the Minister of the day to the historical facts alone of the miserable tale; they revealed, we said, how the mere business of official architecture is indefinitely impeded or irretrievably quashed by the political shiftings of administration, and by the utter absence of any settled principle for initiating works or for carrying them out when initiated. We patiently enumerated points in the abortive recommendations of successive Parliamentary reports; we maintained that all the land on which the Home, Colonial, Foreign, and India Offices now stand, together with all the land which it was proposed in 1877 to purchase for 1,300,000*l.*, might, in 1855, have been acquired by skilful arrangement for less than half a million of money, and we made that statement on excellent authority after due consideration of its importance. We pointed to Paris, which had been remodelled in at least fifteen years less time than it had taken Englishmen to build one block of four Public Offices. We cried with despair that Death, in the course of exhausted nature, could alone prevent the survivors of that devoted band of representative legislators, who aspire to house the great Departments of the State, from discussing in select committee a comprehensive plan for the extension and improvement of the Public Offices on an economical and advantageous system. We deprecated the enormous cost to the country of forty years' talk, adding that the cheques, the pensions, the honours that had been distributed in connexion therewith by successive Governments could not have possessed a more lavish character had any one scheme of any one committee or any one individual been executed, or were it now in course of execution.

It is necessary for the purpose of continuing the Story of the Government Offices to quote from the Report of the Select Committee of 1877, a committee which included among its nineteen members Mr. Gerard Noel, Mr. Beresford Hope, Mr. W. H. Smith, Sir Richard Wallace, Lord Elcho, and Lord Lamington, the last-named (then Mr. Baillie Cochrane) being called to the chair. The part of the report which interests us most is the following:—

"Evidence was offered to the Committee to show that the chief departments of the Government should be lodged in proximity to each other, and to the Houses of Parliament.

Three plans have been submitted to the Committee for the concentration of certain public Departments; the first plan is that of Sir Henry Hunt, the consulting surveyor to the Office of Works. He proposes to purchase all the block of buildings bounded by Parliament-street on the east, St. James's Park on the west, Great George-street on the south, and Charles-street on the north. This contains 133,000 superficial feet of building area, and the estimated cost of the ground amounts to 1,300,000*l.*; on this block, Sir Henry Hunt provides accommodation for the War Office, and the Admiralty, and the Council Office; he proposes to remove the old buildings in Downing-street, and to erect houses fronting the Park, for the First Lord of the Treasury, and the Chancellor of the Exchequer; to add a story to the Treasury Offices, to place the Board of Trade between them and the Horse Guards; to retain the Horse Guards, and to place the Office of Works and the Office of Woods between the Horse Guards and the present Admiralty, and thus to leave the existing Admiralty building at the disposal of the Government. Sir Henry Hunt stated to your Committee that he calculated the whole expense of his scheme, including the purchase of the Great George-street site, at two millions and a half, and that he further estimated that it would set free, and render available for sale, property belonging to the Government, including the existing Admiralty building, as well as release the houses which are now hired, represented by a capital value of a million. This plan, Sir Henry Hunt said, does not provide for the Civil Service Commission, nor for temporary commissions. It appears to the Committee undesirable to add a story to the existing Treasury block of buildings.

Another plan was submitted to the committee by Mr. Mitford, the permanent Secretary to the Board of Works. The witness proposes that the public offices should be placed on the west side of Charing-cross and Parliament-street, and that incidentally to this scheme the narrow part of Charing-cross should be widened, and the Mall extended into Charing-cross at the point where Messrs. Drummond's Bank now stands. On the park side the Horse Guards would form the centre of a group of public buildings, and there would be no encroachment on the Parade.

For carrying out this scheme it would be necessary for the Government to acquire the whole of the Crown property and private property which lies between the corner of Spring-gardens and Cockspur-street and the present Admiralty, together with Dover House, which belongs to the Crown, and a portion of the block bordered by Great George-street to the south and Parliament-street to the east, setting back Parliament-street to the line of the new Home Office. Sir Henry Hunt estimates the probable cost of Mr. Mitford's scheme at three-quarters of a million in excess of that of his own. Mr. Mitford proposes by his plan to obtain an additional building area of twenty-five per cent. over that of Sir Henry Hunt.

The third plan is that produced by Mr. Cates, one of the surveyors of the Office of Woods, and includes one side of Whitehall-place, and the houses in Whitehall-gardens up to Montagu House. It makes use of the land known as the Fife House site, and the vacant space of ground lying between the public gardens on the Embankment to the south of Whitehall-place, and to the west of the public gardens of the Embankment. Here it is proposed to place the War Office, the Admiralty, and most of the other departments provided for in Sir Henry Hunt's plan. Mr. Cates estimates the cost of this site at 850,000*l.*"

The result of this was that large sums of money were expended in the acquisition for Government purposes of property in Great George-street, King-street, and Parliament-street, and these sums have been expended with a view to utilising what is known as the Great George-street site. For this purpose property has been bought and paid for at a cost of 241,681*l.*, and this consists of houses still in occupation. In round numbers a quarter of a million of public money has, since 1877, been

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spent by successive First Commissioners of Works, with the object of placing new Public Offices on a site bounded by Great George-street, Parliament-street, St. James's Park, and the block of four Offices last erected. But suddenly a new departure is determined on, and if this new departure be not attended by a compact or an understanding for which the metropolitan ratepayers will eventually pay, it will be from no fault of her Majesty's present advisers. For the moment it suffices for the First Commissioner to ignore a comparatively enormous expenditure (made for the purpose of concentrating the War Office and Admiralty on the Westminster side of the Horse Guards) in order that the said two Public Offices may be concentrated on the Charing-cross side of the Horse Guards, at a cost for the site of 460,000*l*., only 160,000*l*. of which will come out of the national pocket, the remaining 300,000*l*. being for Crown lands, and therefore merely a transfer from one Government account to another. We publish this week a plan of the scheme, as it is proposed to be carried out by the Office of Works, and we shall return presently to a consideration of it. Meanwhile it may be as well to inquire into the eventualities and possibilities connected with the property purchased by Government in the neighbourhood of Parliament-street or Great George-street, and the quarter of a million of money spent there, now to all appearances for no definite or settled purpose. This land, we are credibly informed, is to be offered to the Metropolitan Board of Works. It is actually proposed, if it has not already been publicly announced, to throw upon the Metropolitan Board the duty of widening Parliament-street by the obvious absorption of King-street, and to hand over, for a substantial pecuniary equivalent, Government property recently purchased at a heavy, even an exorbitant cost, in order to obtain, at a vast extra outlay, the very improvement in the approaches to the Houses of Parliament which the scheme of building Public Offices in Great George-street would have of necessity accomplished. It is actually proposed thus to misuse money raised by Metropolitan rates, under powers hastily accorded by the House of Commons to the Metropolitan Board, and ungrudgingly given by the ratepayers, partly because they believe it is to be spent in the improvement and amelioration of the poorer districts of London. In other words, in order to form a spacious approach to the Palace of Westminster, or rather to complete the approach commenced at the very beginning of the last century by the removal of King's-gate, it is proposed to suggest the diversion of money, granted for metropolitan necessities, to continue an enlargement which, if needed at all, is of imperial not metropolitan character. The bait to be held out is, probably, the increased value of frontage space. We cannot, however, believe that the shrewd majority of the Metropolitan Board will be deluded into such a course by any deceitful anticipation that the value of the new frontages created by the widening of Parliament-street will more than compensate for the entire expenditure involved. At the same time, the bait to which we refer, as likely to be held out, is not dissimilar from others at which persons of influence in both the Imperial and metropolitan Parliaments have been previously tempted to nibble.

To come now to the present First Commissioner's scheme, and to the points in which it carries out the recommendations of that Select Committee which reported to the House of Commons on the 6th of July, 1877. It will be seen that the proposed War Office and Admiralty are placed side by side, and the former conveniently adjoins the Horse Guards; but neither of the proposed Departments can be said to be placed in proximity to the Houses of Parliament. By the scheme the present Horse Guards' building is to become, viewed from the Park, the central feature of a rectangular group of Public Offices; but if the latter are ever to contain the required accommodation, they must be raised to a height double that of the Horse Guards. By the scheme the whole of the present Admiralty administration must be evicted, and offices found for it elsewhere for a period of several (at least eight) years, and other minor Departments will be similarly disturbed. Yet some twenty-five years ago Sir W. Molesworth's language was sufficiently clear on this head. "By more than one removal," said he, "or by several partial removals, the expense would be much increased . . . . and arrears might be created that it would require years to recover." By the scheme it is proposed to erect lofty blocks of many-storied buildings around enclosed quadrangles, three of which out of five are palpably inadequate, even presuming that modern science advocated such a mode of arrangement. On the contrary, every effort has been made of late years to abolish the closed square, to build in such a manner as to allow a thorough draught of air to penetrate interior courts and courtyards. The quadrangles of Sir Gilbert Scott's block of offices, excepting always the central square, are admittedly too small, and the stuffiness and dreariness of the interiors are largely due to the acknowledged inadequacy of his quadrangles. Yet those are very slightly, if at all, inferior in size to the smaller quads of the proposed War Office and Admiralty, and it is not improbable but that the new buildings will have to be carried higher than the India and Foreign Offices. Moreover, the Select Committee of 1877 heard evidence tending to convince the members that the serious defects in lighting and ventilation complained of in Sir Gilbert Scott's building arose chiefly from the limited space allowed to the architect; yet the space proposed to be devoted to the two new Public Offices appears to be relatively even more limited in building area. One statement made to that Committee is also important, for it emanated from Mr. A. B. Mitford, who himself submitted to the Committee a well-considered plan, in which he placed the War Office next the Horse Guards on the Charing-cross side, and the Admiralty in Great George-street, on the admitted plea that the Departments with which the Admiralty transacts its chief business are the Colonial Office and the Foreign Office; yet by this latest scheme of concentration the proposed Admiralty forms one extremity of an extended group of existing and proposed buildings, and the two offices with which it has most to do are at the other extremity. Again, the opening up and prolongation of the Mall to Charing-cross was a happy feature of Mr. Mitford's scheme, and one to which the present First Commissioner seems, almost wilfully, to be opposed. Nay, more, by this scheme the latter has placed an official residence crossways in such a position as to effectually prevent extension or opening-up of the Mall at any future time. Lastly, we believe we are correctly informed when we say that the plan which accompanies and is part of the Public Offices Site Bill is chimerical and speculative; and though each of the Departments interested has been naïvely asked whether the said plan affords it sufficient accommodation, and has answered in the affirmative, we should like to know how the said Departments can possibly judge of requirements which the Office of Works has thought fit to meet in block plan only. We should like to know what guarantees the Government can offer the House of Commons that the two departments can be profitably and efficiently housed on the spot referred to in the Public Offices Site Bill; and whether, if it be ultimately found too cramped for the purpose, another First Commissioner will be permitted to promote, on the score of economy, another Public Offices Site Bill on the other side of the Horse Guards or in Gt. George-street for those portions of the War Office and Admiralty which could not be got to fit in with the present scheme of extension and concentration at Charing-cross. In fine, is it too much to require from a great Department that it should do for the public architecture of the nation what an architectural master does, when he sets the programme of a design to be worked out by his pupils?—is it too much to expect that the Office of Works should first convince itself by plans, sections, and elevations that the scheme it proposes, through the mouth of an untried First Commissioner, is architecturally feasible and safe, both on sanitary and constructional grounds? The possibility of the truth of these incredible circumstances,—the fact, even, that Parliament is asked to sanction expenditure for a site, on the bare hypothesis that it may fit two of the most important Departments of the public service,—should induce suspicion even among the forty or fifty odd members who sit out the present debates, two-thirds of whom at the eleventh hour devotedly support anything and everything the Government desire to carry. It is, therefore, commendable when no one moves,—when the Metropolitan Board of Works, naturally anxious about the fate of its Money excusably silent,—that an attempt should be made to call public attention to the proposals of the First Commissioner. This has been done by the publication, by the Royal Institute of Architects, of the plan as it is proposed to be carried out and completed by the Office of Works (see our illustration, page 50), and of the protest made against it while in committee by the council of that body. Much as they seem to doubt the feasibility of placing two big Departments on so confined a spot, they do not oppose merely with that object; but they urge, as an indispensable feature of such a scheme the prolongation and opening up of the Mall to Charing-cross; and in this, it is hardly necessary to add, we heartily concur.

In our remarks respecting H.M. Office of Works and this latest scheme of concentration, we have no intention of animadverting on the kind of architectural work done in that office. The two gentlemen whose duty it has been to design and see carried out the new Post Offices in St. Martin's-le-Grand and Queen Victoria-street, and the new Central Police Court at Bow-street, and who are occupied upon similar works in various parts of the country, have shown what they can do, and how well they do it. Mr. John Taylor and Mr. James Williams, the present surveyors employed at comparatively small salaries in the Office of Works, are Fellows of the Institute of Architects, and merit the fullest recognition from their colleagues on account of the architectural works they have executed. But their time is wholly occupied with the respective and special duties assigned to them. If they have been consulted at all about this latest scheme of extension and concentration, it has probably been with the object of obtaining assent to preconceived views, not their own, rather than of eliciting useful criticism or professional advice.

The scheme now before Parliament draws its origin from almost forgotten sources; it is based upon an excellent design by Lieut.-Col. Clarke (now Sir Andrew Clarke), the plan of which, published in a Parliamentary paper, dates about the year 1865 or 1866. A fine model of this very design is now being exhibited at the Bethnal-green Museum, and it is well worthy of study. Sir A. Clarke proposed to occupy the whole of the west side of Whitehall from Spring-gardens-passage to Great George-street. In his proposed War Office and Admiralty, he arranged quarters for four squadrons of cavalry; and in the buildings which he proposed to place in Great George-street, he put barracks for a battalion of Guards. Mr. Mitford's plan of 1877 was largely founded on Sir A. Clarke's original design, and Mr. Shaw Lefevre's latest scheme for the War Office and Admiralty is a hash of both, considerably shrunk and spoilt in the cooking. When we venture to hint that no architect can have had anything to do with it, we plead on our own behalf that Mr. Mitford's words before the Committee of 1877 afford sufficient justification for the doubt. In answer to a question put by Mr. Beresford-Hope, this gentleman then said, "If you were building a new War Office or a new Admiralty, it would be infinitely better built and more satisfactory in every way if it were built in the Department. . . . The only additional expense involved would be the hiring of a few temporary draughtsmen." Can it be that, in the natural haste of a new First Commissioner to consummate his temporary alliance with the national architecture, a temporary draughtsman has been brought a little too prominently forward?

But to be serious over a grave question. No one conversant with the progress of Public Works believes that the architecture of this country can improve or develop in face of the contempt with which it is treated by the Government and the mass of the population. In no other great European capital are the modern public buildings so petty in conception and so miserable in execution, as they are in wealthy London. Among no other people in Europe are great schemes, affecting the architecture of the entire nation, devised or suggested without the advice and assistance of distinguished members of the architectural profession. The results of this prolonged neglect are too apparent. Though in the design and construction of country houses, of schools, of churches, of small picturesque buildings of every class, the British architect is avowedly superior to his Continental brethren, yet in all the higher works of architecture, in the setting out of large open spaces, [illegible]t terraces and blocks of building, he is

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infinitely their inferior. As it is, many a local architect in a French province, if suddenly called upon to plan a Place des Victoires, a Church of the Invalides, or a Louvre, for his native town, would probably at once acquit himself better of the task than even the most prosperous or most successful architect in this country after months of preparation. The failing or fault is one of a traditional character; it does not arise from inherent incapacity. Both the genius and the money for action exist, but the opportunity is never offered. Yet a British Minister who haggles over a 100,000*l.* for a public work of architecture, will carelessly spend more than a tenth of that sum in moving a "Woolwich infant" from one workshop to another. This is not mere cavil, nor are we attacking the heads of one political party more than those of another. Whig and Tory, Liberal and Radical, are all alike and of one mind on the subject of expenditure for artistic improvements; and though, by dint of ruse, official cleverness, or technical intrigue, the country has often in the end to pay huge sums of money for its national buildings, there is always something unsatisfactory in them,—a something which, if traced to its source, will generally be found due to the petty bickering, the mean suspicion, and the false economy of the party or clique which started them. In any great European capital other than London it is the custom to regard a work of true architecture as a monument of the fine arts, a trophy of the national wealth, and as a mine of instruction for the people. Each fresh chapter to the Story of the Government Offices points only in one direction. If we are ever to have public bulidings worthy of the genius of the English people, of a character proportionate to their influence and wealth, we must have a Government Department differently constituted to H.M. Office of Works, and possessing nobler aspirations than those which actuate and have too long actuated the chiefs of that Office. The sole idea of the Metropolitan Board of Works, when called upon to provide a new thoroughfare between Charing-cross and Holborn or elsewhere, was "a convenient cab route," and, from the recent doings of H.M.'s Office of Works, the First Commissioner has apparently no loftier aim. Nor can reasonable men expect anything better. In this country, the First Commissioner of Works is chosen for his political opinions; his only technical advisers are his own subordinates, whose reports he is legitimately enabled to alter, disregard, or suppress; in fact, he is not bound to listen to any professional advice at all. He is a political agent, expected to do his duty to the party that supports him, to vote "straight," and use on behalf of his party the "straight" influence that circumstances have given him. He may be called upon to take the chair in committee on the subject of Irish coercion, or Egyptian control, but no sane person expects him to be conversant with architecture or art, and if questioned thereon by an independent member, it is more often done with a view to invite competent criticism outside the walls of the House of Commons than to elicit from the Minister a thought or an opinion on such matters as those for which the appointment he holds would in other countries exist.

Very different is the action of France in regard to public buildings. Since the days of the great Colbert, the Government have initiated, controlled, and generally superintended the French public works. For a hundred years, in spite of viscisitudes of which Englishmen have no experience, at times victorious at home and abroad, but often beaten on sea and land, her cities and capital invaded, torn by civil wars and tumult, France has, nevertheless, ever stood, in the domain of architecture and art, foremost among the nations of our time. No change of Government or fall of party has destroyed her artistic supremacy. Some of the very laws by which the streets and buildings of Paris are even now controlled, some of the very institutions by which the French Minister of Public Works, or, as he is now termed, the Minister of Arts, is supported and advised, were in force by decrees of the Republic of 1783. The decrees of the first and third Napoleon, of Louis Philippe, and of the Republic of 1871 in the matter of public works, all confirm and develop a similar principle, viz., the attachment of trained professional architects to divisions and sections of the capital, and to the great national monuments and administrative offices; as well as the formation of boards or councils, largely composed of architects engaged not only on works for the State, but also on works obtained through private practice. A *service* of Historical Monuments, which the British Parliament is now being asked to talk about, was started in France as early as 1830; a *service* of Public Works composed of architects, and some of them bearing names of European reputation, and a *service* of Diocesan Edifices have survived both monarchical and imperial *régimes*. The present Republic, though it has made important changes in other branches of administration, seems never to have even dreamed of breaking the national traditions in this particular. On the contrary, Republican earnestness and energy have recently increased the obligation which French architects and artists owe to the State. There already existed three *commissions* for the *services* of architecture; but, by a decree published in January last, a Superior Council-General has been appointed to assist the Minister of Arts in all matters relating to the *Services d'Architecture* of Civil Buildings, of Historical Monuments, and of Diocesan Edifices. It is composed of architects holding such positions as that of Inspector-General, who are made members by right; of other architects connected with civil buildings, historical monuments, and diocesan edifices, chosen by the minister under whose presidentship the Council meet. The post of member is honorary, and one of the many questions to be submitted for the consideration of this General Council is the "Organisation of the State buildings."

Until some similar kind of advising power be instituted in England,—until some Board, principally composed of men distinguished in architecture and the cognate arts, be appointed and acknowledged by the Government and the country,—the conclusion of the Story of the Public Offices can only resemble its ludicrous course of nearly fifty years' duration. Meanwhile, its continuation bids fair to be as humiliating to the educated classes of the community, as the repeated efforts at so-called extension and concentration have been costly and unprofitable to the nation at large.

SEPULCHRAL AND MEMORIAL ARCHITECTURE.*

AND what of our present architectural design of this class? We have touched upon the leading characteristic forms prevalent in antique and Mediæval times, and on the painful Georgian period during which the walls of our great Abbey, as well as other churches, were crowded up with monstrous imaginings, using the adjective in a double sense, both in regard to actual measurement and artistic character. It is, however, remarkable how large a part sculpture of one kind or another played in the monuments of this period. It was seldom in every sense good sculpture,—often not in any sense; Flaxman, indeed, executed some beautiful work of this class, and after him (*longo intervallo*) Roubiliac, though the unquestionable talent of the latter could not atone for the pretentious and sometimes grotesque character of his monuments, and his want of simplicity and dignity. And perhaps for one reason it is better that sculpture should not form habitually the prominent feature in monuments (unless it be purely portrait sculpture), for it is hardly possible that there can be the necessary resources, either in regard to genius or money, for producing monumental sculpture of a high average of merit, save in a few exceptional cases. From whatever cause, however, there can be no doubt that monumental design has for the present very much given up sculptural form, and has become in late years decisively architectural and decorative rather than sculptural.

Under such circumstances, the designing of monuments becomes a matter of the expression of feelings and ideas by means of purely architectural form assisted by emblems, either such as have a meaning obvious in itself, or such as have acquired a meaning by dint of long and habitual association. Of this latter class there is much more to be seen in our own collections of monuments, than of original and obviously suggestive forms not derived from history and association. A walk through a large cemetery affords a curious spectacle of the combination of forms and emblems connected with various religions and customs long since passed away. The Egyptian obelisk is certain to be there in some form or other though it is never to be seen in anything like the size and mass of the ancient examples. Those were the records of kings; private persons can scarcely afford such costly insignia, nor perhaps would cemetery authorities be very ready to allow of anything on so large a scale as compared with the average scale of the average tombstone. Then, as we observed, the Greek stele form is really repeated in the ordinary flat upright tombstone with a head shaped in some characteristic outline. Sometimes we find the Greek stele in its original form and proportions; but this is not often, and is only in recent monuments, since the study of antique forms as models has been revived with more correctness and comprehension of their character. But in general the tombstone is shorter and broader in proportion than the original stele, and decorated on its upper limits with some emblem of post-Christian character; sometimes a cherub's head with wings outstretched across the top of the stone, which was long a very favourite device on tombstones of the early part of the century. A more recent fashion is the carving of a spray of palm or other vegetation apparently resting on the head of the tombstone, or growing down out of it. A form which was much in vogue some twenty or thirty years ago, but is now dying out, was that of an inscription slab laid horizontally on stone uprights lifting it 2 ft. or so from the ground. This may be regarded as a reminiscence of the Mediæval altar form of tomb, on which the recumbent figure or figures were usually placed; in its modern form it became a sort of cheap imitation, without the figures or the architectural work at the side, in which the slab which was formerly the resting-place of the effigy has become only a field for the cutting out of an inscription in such a position that it cannot easily be read. That is one of the great distinctions between the spirit of Mediæval and of modern monuments; the former showing the artistic memorial without the catalogue of virtues; the latter omitting the art from the monument and giving the praises of the deceased only. The sarcophagus form has taken quite a new lease of life; it is found over and over again now among cemetery memorials; sometimes in stone, more often now in granite. The strange thing is that we see this ponderous granite sarcophagus placed on the ground, or even elevated on a lofty granite pedestal, an empty sign, while the real receptacle of the body is below in the ground. So completely is the illusion carried out, that the visible sarcophagus is often made with the semblance of rings carved on its sides, as if to represent as completely as possible the sham movable character of the block of granite, the material and function of which are thus falsified. Looking at some of the monuments of this class which have been erected (or, perhaps, we might rather say, laid down) of late years, one is filled with astonishment that people should be willing to pay so much as these masses of shaped and polished granite must cost, for a form of memento which, in this way of using it, has not only no beauty, but absolutely no meaning of any kind, and no possible relation to the supposed feelings of Christians towards their deceased friends and relatives. However, we are not urging its use as a receptacle for the body, which would be a step in the wrong direction. But, as it cannot advisably be so used, its semblance may surely be dispensed with, as an unmeaning sham.

Intermixed with this curious piece of costly and unbeautiful Paganism, we find since the ecclesiological revival the presence not unfrequently of upright tombstones derived from the old *quasi*-Greek model, but carved into terminations more or less Gothic, quatrefoil and trefoil heads, or gablets with cusping in them, and surmounted by the cross, which, of course, in recent tombstones, appears in almost every kind of form, having been revived as a common symbol of churchmanship, after being long held in slight esteem as a badge of what used to be termed "popery." Some of the methods of introducing the cross are pleasing, many are (in point of design) otherwise, and convey too much the idea of a rather poor sort of ingenuity employed in working the desired emblem out of some form at first sight very different. Latterly there has been rather a preference for perfectly simple and unornamental crosses of white marble or granite, as if the form itself were important and suggestive enough without any trickeries of ornament. This is in better taste

* See p. 2, *ante*.

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than the over-ingenious forms we have referred to, and perhaps there is much to be said for this treatment of the most sacred Christian symbol, as sufficient in itself without any adventitious aid; still, we prefer some suitable decorative treatment, for which plenty of beautiful suggestions and precedents can be found in Mediæval art without going into exaggerations of form or decoration. The cross form is also frequently applied now, according to a Mediæval fashion, which is an adaptation of the sarcophagus form, or, rather, of the sarcophagus lid; a thick, heavy slab bevelled in a ⋀ section, and with the upper edge crossed by a transverse ridge; and frequently in modern, as in Mediæval work, this ridge has the form of a long cross, with the points budding into trefoils, worked on it. In one instance we have seen a flat metal cross riveted on to the ridge of the marble slab,—not a happy idea; it takes away the monumental aspect of the thing, and looks as if it might be easily lost or carried off.

These represent the prevalent types of modern monument in our cemeteries, the remaining one being that which represents the most distinctly architectural form, the small building which is placed not unfrequently over the family vault, with a door for entrance on the occasion when another tenant is brought into that silent home. As a general rule, the Egyptian or Greek style seems to be preferred for these small mansions of the departed. It has been much the fashion to make them with every appearance of solid strength, whether this quality be really there or not; with walls battering, and doors with sloping jambs, and when the Greek style is used, it is also with a very solid, heavy treatment, or nearly always. There seems something unnecessarily cold and severe in the Greek forms adopted, something unnecessarily sombre and melancholy in the heavy outlines of those in the Egyptian form; but these forms are certainly preferred in practice. Occasionally we see such a tomb building of Mediæval character, looking far more consoling to the association, certainly, than these cold blocks of simulated antique architecture; and we remember to have noticed one in which the building was made to represent a little chapel, with stained-glass windows, by means of which the tombstone and its inscription, and the *immortelles* and other offerings of affection placed there, could be seen through the open grille of the door, which at the same time prevented unauthorised intrusion. This is certainly a more pleasing way of carrying out such a structure than building up a blind cavern above the earth with a closed black door, as if the actual remains were immediately within and were to be carefully hidden from sight.

The French seem to have adopted this form of monumental house, as we may call it, more generally than we have, and this leads us to say a word as to the aspect of monumental art of this class among the French. The most accessible reference to this is furnished by M. Cæsar Daly's beautifully-illustrated and interesting volume, entitled "Architecture Funéraire," representing a large number of the modern monuments around Paris, of all shapes, sizes, and degrees of elaboration, and preceded by a very thoughtful and suggestive preface. We have alluded to the ideal character which should, and at all events may be, incident to memorial architecture; and every one will expect that a French writer on such a subject will not be slow to recognise "the idea" much more systematically than most English artists would recognise it. M. Daly proceeds, indeed, to classify his subject with true French method and regularity; and if we sometimes find such method too methodical, the perusal of his essay really throws a good deal of light on the subject, and it might be studied with much advantage by those who have to promote and to design monuments, as it would, at all events, suggest a definite principle or idea instead of the confused and apparently aimless mingling of fancies among which our English memorial designers ramble. M. Daly classifies memorials under three heads in the first instance: those which are the expression of religious faith, either that of the deceased or of his friends; then those which are the expression simply of the idea of death, its emblems, and its reality; and thirdly, those which are intended to do honour in an especial degree to the memory of the deceased person, to represent his glorification or apotheosis. This is a very good and perfectly reasonable classification. Upon this follow combinations of two or of all of these ideas,—memorials which represent death and faith triumphant over it; which represent death combined with the apotheosis of the person commemorated; and there are those, M. Daly seems to consider, which may represent all three ideas,—the combination, perhaps, of the sarcophagus, the cross, and the bust or figure of the deceased. But if we cannot follow our author entirely through his rather too systematic method, there is certainly in this way of looking at the subject a definite suggestion for a treatment of a memorial less vague than that curious combination of Christian and Pagan emblems which so frequently meets us on English monuments; and the manner in which these various ideas are illustrated in the designs given in M. Daly's work is certainly very interesting, and shows that French architects have given a good deal of thought to the subject. The tomb of which the sarcophagus is the prominent feature is treated in a variety of ways, some of them sufficiently original and effective to atone in some degree for the anachronism of its use. In one example we have it as the upper member of a ponderous horizontal design, granitic in character at least, which shows three well-marked stages, the base spreading outwards towards the ground, the strong horizontal lines thus produced contrasting finely with the vertical lines of the cypresses grouped around. These trees, so much used as adjuncts of cemetery gardening, present mainly upright lines, which serve to bring out with more force the horizontal lines of the order of monuments we are just speaking of. This relation of lines is a point to be thought of in the composition of cemetery architecture. The other tree, which has been most associated with the situation, the yew, is, on the other hand, markedly horizontal in its lines, and, therefore, affords effective contrast to the class of monuments, such as obelisks and spirelets, which are vertical in their tendency. These two trees are, in the solemnity of their dark and heavy masses, emphatically trees of death, sombre and still in their aspect; and they combine well in every sense with the monuments in which the idea of death is the predominant one. But they are equally associated in practice with every description of monument to the dead. This seems a mistake. If we wish to convey in a monument predominantly the idea of Christain faith and hope, surely it is out of place to associate such monuments with the presence of these sad and funereal trees. Rather associate them with what is light and hopeful in nature,—with glad flowers and trees of fresh verdure; though it is, of course, often difficult to arrange for such grouping practically. The idea of faith is, in the French specimens given by M. Daly, chiefly expressed by the addition of the cross. This forms the crowning feature of not a few of the "family vault" erections, of which many specimens are given by M. Daly. In the design of these small, but in every sense monumental-looking, erections, the French architects display considerable variety and a great deal of taste, sometimes considerable power of expressive design. They are mostly founded on Greek forms and detail, treated, however, with much freedom and originality. The only two points we should object to about them, taken *en masse*, are the rather too pretty and "shoppy" style of the designs in perforated work in the doors, some of which suggest the idea of the door to a *magasin des modes* rather than to a tomb; and the tendency to the sculptured representation of hanging wreaths upon the exterior of the tomb. This latter feature is, no doubt, æsthetically very much on the same footing as the Roman ornament of festoons, which originally were the permanent carved representations (we can hardly doubt) of actual garlands hung on a building to give it brightness and colour on a festival day. But the precedent is hardly worth following out afresh. In the monuments designed to the especial honour of their subject, the third class ("*glorification*"), the French architects stand high. They have always had a strong feeling in favour of this kind of artistic honouring of the memory of distinguished men, and they carry it out often very well and very effectively. At times we meet with too curious and weird fancies, as in the monument to Rousseau in the Pantheon, where there is a semblance of a built tomb with doors, nearly closed, through which is protruded, apparently, the hand of the deceased holding out a torch, as if still to light the world. This may sound rather effective, but it looks curiously weak and sensational in execution. That torch, too, gave but a flickering and smoky glare at the best, which few will accept now. The idea is a "conceit"; and of all things conceits are out of place in monuments. But some of the French monuments of this honorary class are very good. In one case it is a figure, the genius of the place, which stands on a pedestal at the head of the grave, pointing downwards towards the honoured dust beneath. In a good many the idea is a portrait bust of the deceased, below which are emblems of his peculiar work or talent while living, and these emblems are in some cases (not in all) very well and effectively worked into decorative treatment. One of the best treated is that of Alfred de Musset. The space appropriated to the tomb is backed by a coped marble wall, the centre portion of which, thicker than the rest, rises into a kind of stele terminating with a pediment, and bearing beneath the pediment the bust of the poet on a bracket; the lower portion on either side is inscribed with the titles of the poet's principal works,—very strange are the associations suggested by the titles of some of these, in such a situation,—

"Beside the cold *hic jacets* of the dead,"—

and in the centre portion, below the bust, are engraved the poet's own musical lines, anticipating the treatment of his tomb:—

"Mes chers amis, quand je mourrai,
Plantez un saule au cimetière:
J'aime son feuillage éploré,
La paleur m'en est douce et chère,
Et son ombre sera légère
A la terre où je dormirai."

The tree loved by the poet hangs over his grave. This is an example of a really suitable monument, graceful and expressive of its purpose, and not gloomy.

It is rarely that in an English cemetery we meet anything so well thought out and suitable to its purpose as this. We want to see more original thought bestowed on such memorials, less of the continual repetition of worn-out and often gloomy and unsuitable emblems; calm and repose should breathe around the resting-place of the dead, but not gloom; the aim should surely be rather to counteract that. One may look long through the monuments of our most crowded cemeteries without finding anything that is not commonplace, that is not stale and unprofitable, mere variations (hardly even variations) on worn-out themes. As we have described one good French example, we may also notice one good, though smaller and humbler English example, which struck us with pleasure the other day in wandering through the wilderness of commonplaces in never-mind-which of our suburban cemeteries. It was a monument to a lady artist, a square tapering pillar of unpolished marble,—the old form of the Greek stele, in fact,—carved at the top into very delicate and graceful ornament of Greek type, and halfway down the stone a very delicately-relieved portrait-figure of the object of the memorial, seated with brushes and palette in hand, and beneath, the words "Whatsoever thy hand findeth to do, do it with thy might." Here was something really graceful, feeling, and to the point. It is but too rarely we come across any monument in such good taste, both in feeling and in artistic form.

As a parting suggestion, we would observe that some of that scattered and too miscellaneous effect which a collection of monuments incongruous in style often presents, might be obviated by the erection in cemeteries of mausolea containing niches or wall spaces (external or internal) somewhat symmetrically arranged, in each compartment of which a monument, in accordance with the special wishes of each proprietor, might be placed, all of which, however, would necessarily be reduced to an approximately similar scale, and perhaps subject to a certain degree of supervision as to style. A harmonious architectural effect might thus be produced, very different from that of the motley group of designs which are scattered over the ground in ordinary cases, and in which each monument, while displaying its own special features of design, would contribute more or less towards the total effect.

Mr. Thomas Graham Jackson, M.A., architect, late Fellow of Wadham College, has been elected an Honorary Fellow of that society. Of Mr. Jackson's principal work in Oxford, the New Schools, a full account was lately given in the *Times* and the *Builder*.

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THE POINTED ARCH AND THE LATEST DISCOVERIES IN SYRIA.

THE question of the origin and the early history of the pointed arch has recently received what some may consider an illustration from the exploration of Eastern Syria. Although the small building on the top of the Citadel hill at Amman, has been visited and to a certain extent described, by Consul Finn, Colonel Warren, and Canon Tristram, neither of these gentlemen was able to remain long enough on the site to give any detailed description of the work; and it is to the report of Captain Conder, dated in January last that we are indebted for the information that the building, so far from being, as hitherto supposed, of a Byzantine character, is as unlike the Byzantine churches as it is to the Arab mosques of Palestine, and that "it has, indeed, a unique character, and is well worth minute study."

The peculiarity which strikes us as at once the most novel and the most instructive is the occurrence in the same small structure of the three distinct types of the round arch, the pointed arch, and the Moorish or horseshoe arch. Nor is the coincidence the less striking from the fact that the latter types occur in somewhat undetermined, or, as the reporter says, "embryonic, condition." A ready idea of a plan of the edifice may be formed by dividing each side of a square into three, and drawing parallel lines which will thus divide the area into nine equal squares. Of these the central division is an open court, and no signs are left that it was ever roofed over. It thus presents a strong analogy to the open *atrium* of a Classic house. The four angles are occupied by vaulted chambers, and in the north-west angle are the remains of a staircase which originally led to the roof. Four arched recesses, each measuring about 18 ft. square, open on the central court, and the angles between these recesses are covered with elaborate sculpture.

These four opposite arches, which, on a hasty view, might be described as semicircular, have each, however, a slight and almost imperceptible point. It is difficult to attribute the fact to any other cause than that the architect, being aware that it was at the key of the arch that any slight yielding of the structure would become most apparent, and thus cause the greatest disfigurement to the building, introduced that slight geometric artifice which should most easily deceive the eye, in such case, and preserve the beauty of the building even under slight displacement. At all events, we can recall a similar artifice in the case of more than one long barrelled bridge and culvert in the kingdom, in building which the central part was purposely raised by some inches above the voussoirs. The object was, that if any settlement took place in the middle of the arch, it should not be visible, as it would not come below the line of the voussoirs. It is very possible that this is not an unusual expedient,—we speak of it as a practical one, and the remembrance of it seems to us to throw a new light on the introduction of a very slight, but not inelegant, departure from the plain semicircular arch.

Exactly the same structure has been detected by Captain Conder in the arches of the famous dome of the Rock in Jerusalem; those, that is to say, that support the drum. The arches in the outer arcade of this building are round, and are covered with ancient glass mosaics. The inner row of arches is now covered with a marble casing, so their true structure is not distinctly apparent. But in the photograph taken in 1874 (which has been published by the Palestine Exploration fund), three arches are shown directly facing the spectators, and the slight point can be distinctly detected.

Whatever may be thought of the explanation thus offered, there can be no doubt that in these concurrent examples may be witnessed the birth of a pointed arch. Nor is this the less interesting when we find that another deviation from the exact semicircle, viz., that continuance of the curve of the arch below the horizontal diameter which we usually call Moorish or Saracenic,—in fact, a slight horse-shoe,—is to be found on either side of these almost imperceptibly pointed arches. At the base, and again in the upper part, of the angular abutments of the four arches, are true round-headed arcades, consisting of small semicircular arches, each supported by a pair of columns, connected by one plain abacus or capital. A sort of flat dog-tooth moulding adorns these arcades, and also surrounds the eight Moorish or horse-shoe arches just mentioned. The face of the larger arches,—those with the nascent points,—are composed of visible voussoirs, but the photograph shows under one of them what appear to be slightly projecting ribs.

The enrichments of the recesses and of the arcades are floriated or arabesque. The horse-shoe arches consist of two plain mouldings, with wider belts of dog-tooth moulding between them. A central mullion rises between seven pairs of superposed circles, each of which is filled with a floriated or arabesque ornament. In both the upper and the lower arcades double spirals, in some cases of very elegant form, occupy what would, if the walls were pierced, be the lights. A belt of circular ornaments runs round the angle, between the extrados of the horse-shoe arches, and the plinth on which stand the twin columns of the upper arcade. There are no figures of birds or of other forms of animal life; in which respect the sculpture differs from that of the famous palace at Maschita, discovered by Canon Tristram, although in many respects there is a similarity between them. In one of the Moorish-headed recesses the central mullion is treated so as in some way to resemble the sacred tree which is found on Assyrian bas-reliefs.

There is thus in this small building an extraordinary association of architectural forms, to which we are in the habit of attributing widely different places and dates of birth. The round-headed arcade might be found in an English abbey, or in an Italian church, and would, in either case, have been regarded as a true local form. The ornamentation, on the other hand, has the Moslem character of avoidance of the likeness of living creatures. But the most remarkable part of the story is the unity of the design. It is not as when Norman Abbot continued the work of Saxon predecessor;—or the line of time can be drawn between the style of Henry and that of Edward. The round arcade, the slightly pointed arch, with its distinct voussoirs, and the Moorish recesses, are so intimately blended in the design as to show the workmanship of but a single hand, the design of a single brain.

In thus saying, however, we must not be understood as committing ourselves to a decided opinion as to the actual date of the edifice in question. Some authorities have assigned it to the sixth century of the Hegira, or twelfth of the Christian era. But in all questions of date have to be included those elements of the local and even of the personal influences which may have caused, in any particular case, what might be regarded as an anachronism, if referred to historic date alone.

The account of the great sanctuary at Hebron which, in our article on Royal Pilgrims and Holy Sites (vol. xlii., p. 538), we intimated as about to be published, has, we are informed, been prepared. It is illustrated by an accurate plan of this, almost the most jealously-guarded of Eastern holy places. Under the peculiar circumstances through which access was obtained to the shrine, it has been proper that the monograph prepared by Captain Conder should be submitted to the Prince of Wales, together with a report, by the same officer, of the interesting discoveries made during the tour of their Royal Highnesses, Prince Albert Edward and Prince George of Wales in Syria. It is to be hoped, in the interests of archæologic science, that the demand of military service in Egypt may not delay the completion of this memoir.

The Hygienic Exhibition in Berlin.—A curious question has arisen in connexion with the catalogues of this exhibition, which were about ready, it would seem, when the destruction of the building, &c., took place. The advertisers are being called on by the publishers of the catalogue to pay the amounts contracted for, the latter having, according to the opinion of several legal authorities, completed their part of the contract. It would seem, according to some reports, as if the discussion would be carried before high legal tribunals. Those who pay now without any trouble will have a right to the insertion of their respective advertisements at half price in next year's catalogue. One contemplated feature of the exhibition would have been of practical value, the providing of penny baths for the populace, this small charge including soap and towels. This would have been a valuable illustration of the sanitary laws, the promulgation of which was the *raison-d'être* of the exhibition.

NATIONAL COMPETITION PRIZE WORKS AT SOUTH KENSINGTON.

To whatever causes it may be due that this year's Exhibition is opened more than four weeks earlier than last year's, the fact is probably none the less welcome to a large number of persons immediately interested in the work of Schools of Art aided by Parliamentary grants. On previous occasions, both the late period of the season when these exhibitions have been held, as well as the unsuitable accommodation provided for them have been matters for regret, whilst the former cause of regret is now checked, the latter remains *in statu quo*. A special gallery known as the "National Competition Gallery," forms part of the main buildings of the South Kensington Museum. Decorative lunettes, typical of different stages of instruction given at schools of art, occupy the upper portion of the walls whereon the students' works have been destined to hang. Above an entrance to this gallery is a long panel, painted by Mr. Prinsep, illustrative of a distribution of prizes to students. In sixteenth-century costumes, functionaries, amongst whose faces may be recognised those of Sir Frederick Leighton, the late Sir Henry Cole, Mr. Watts, R.A., and others, are officiating at the ceremony. Why, then, do not the National Prize drawings annually speak for themselves in this Gallery, adorned for, and nominally dedicated to, them? According to present arrangements, however, the results of the extensive organisation at work all over the country are banished to an ill-contrived gallery of a temporary nature, difficult to find in buildings situated between the new Natural History Museum and the Royal Horticultural Gardens. Curiously enough, the National Gallery proper is actually empty at the time we write.

For some years now an opinion has been current, which the Royal Commissioners on Technical Education have by this time probably verified, that no country can and does display for public scrutiny a collection of students' drawings, paintings, and models, equal in quality and number with that under notice. These works not only exemplify a complete *curriculum* of instruction in painting, modelling, and drawing in connexion with the industrial arts, but they are evidences of the establishment of a school of designers,—a school which differs in the important degree from such as those at Sèvres or Gobelins, which are confined to one or two particular places,—inasmuch as it virtually exists, and is encouraged to exist, all over the country, wherever peculiar requirements of districts or towns sufficiently manifest a demand for its existence.

Upwards of 320 medals and books are awarded this year amongst 1,300 works. These 1,300 works have been selected from over 214,000. Of the 320 awards, some 105 have been awarded in respect of designs for various articles of manufacture, such as wall-papers, carpets, iron work, lace, silks, pottery, cutlery, and such like. Ten years ago, out of 300 similar prizes, seventy-one were given for designs; and the total number of works submitted was 73,000, or about a third of the number now sent in. The Board of Examiners who have awarded the medals this year is composed of Mr. Poynter, R.A.; Mr. Leslie, R.A.; Mr. Yeames, R.A.; Mr. Marks, R.A.; Mr. Boehm, R.A.; Mr. William Morris, Mr. J. S. Stevenson, Professor Unwin, Mr. T. Armstrong, the Director for Art; and Mr. H. A. Bowler, the Assistant-Director.

As usual, the paintings in oil and water-colours from still-life groups, flowers, and fruit are the brightest spots in the collection; and the highest awards given in these classes are taken by female students. The Bloomsbury Female School of Art has, for some years, maintained a supremacy in flower-painting. Miss Ethel Nisbet (aged 21), of this school, wins the Gold Medal by two able water-colour studies (No. 8). The more important of these is a view of white, pale yellow, and orange chrysanthemums, overhanging a broad-lipped porcelain vase, which stands upon the polished surface of a Buhl table. Behind hang yellow curtains, which are parted to disclose two or three shelves, where bits of Chinese porcelain are ranged. A few oranges in a plate help to complete the composition, which supplies opportunity for skill in depicting various materials, in blending delicate tones of colour, and in treating *nuances* rather than marked contrasts of light and shade. The Silver Medal in this stage is gained by Walter Langley (aged 38)

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of Birmingham. In his work, as the age of the student would lead us to expect, there is more force. The details of his composition (No. 32) are, however, less exacting than those chosen by Miss Nisbet. Langley produces a very effective picture of green and brown earthenware, and cauliflower, on a white cloth, backed on the right with a blue rough curtain, and further on by a skilfully-indicated etching with ample white margin. Miss Lucy Leavers (aged 20), of Nottingham, is rewarded with a Gold Medal for her group (No. 6) of golden plovers, rabbit, widgeon, and partridges, which have been recently jostled together in the netted string bag hanging upon the panelled woodwork forming the background. The imitation of the fur and the plumage may nearly come up, in point of fidelity, to the mark of an early Fyt. More original, and affording wider scope for broad treatment of effects of light, is the miscellaneous gathering of white hexagons, cubes, fragments of cloth, plush, fringes, glazed and unglazed earthenware pots, which are distributed upon the rough deal box in the painting-room presumably of the Ilkley School of Art (No. 47). This display of materials for a "still life" group is not reduced to customary conventionality by means of simply contrasting a dark background with objects in light. Charles Stephenson (aged 21), who thus leaves the beaten track, gains a Silver Medal for his painting, which is considerably larger than that of Miss Leavers. One of the most advanced stages of instruction is that which deals with the figure either in the shape of paintings, drawings, or models from the nude, and on the present occasion the specimen of student's oil-colour painting (No. 5), from the nude figure, contributed by A. Hitchens (aged 20), of the South Kensington School, is distinguished by a Gold Medal. The work is one of undoubted merit, showing careful observation and an easy, unconstrained power of accurate drawing and painting. As the servants of a healthy imagination these qualities may be turned to good advantage in respect of either pictorial or decorative art. Alfred Bowcher, one of the members of the Training School at South Kensington, gained a Gold Medal in 1880 for modelling a figure from life, and this year he repeats his performance, choosing, however, a curiously ungainly model (No. 323), spirited in action, but not graceful of limb or feature. The pose of the figure is that rather of a fencer, with foil point on the ground, in an advancing, hectoring, attitude, with his left hand on his hip and head well tossed up. In Mark Rogers's (aged 34) group of contributions from the Lambeth School (No. 10) a pleasant artistic spirit is apparent, especially in his high relief of a female head and half-bust, which he calls "Beatrice" ("Much Ado about Nothing"), evidently inspired by an Italian fifteenth-century relievo. Rogers has successfully produced in this terra-cotta a charming expression about the eyes and mouth of his Beatrice which lifts it beyond mere student work. His, in fact, is the sort of work which in France would probably be marked *hors concours* instead of being admitted to enter the lists and winning a Gold Medal. Thomas Alison (aged 20), of the Edinburgh School of Art, receives a Gold Medal for his monochrome study (No. 1), of the Apollo Belvedere, swiftly painted and perhaps hardly carried far enough towards completion. It is strikingly in contrast with the beautiful chalk drawing from the antique figure (No. 9), by Arthur Nowell (aged 20) of the Manchester School of Art, for which a Gold Medal is awarded. No less than three Silver Medals and five Bronze Medals are awarded to the Lambeth School of Art for drawings from antique figures alone, yet not one of these Lambeth drawings approaches in degree of finish and grace that of Nowell's "Antinous." It will suffice to say that the remaining stages of purely student work such as painting flowers without backgrounds, painting ornamental casts in monochrome, chalk studies of the life, &c., are duly represented; but no work in these stages gains an award higher than that of Silver Medal.

Turning now to the section of original designs for ornamental manufactures, the places of honour are given to modelled arches sent in for the Plasterers' Company's Prize, to a high-standing faïence vase, and to the best design for carpets. Evans (aged 21), of Gloucester, receives the first prize given by the Plasterers' Company for his arch (No. 3), lacking constructive decision and the unity of ornament which certainly mark the less ambitious arch (No. 50), by Trealeaven, of Westminster, winner of the second prize given by the Plasterers' Company. The Italian arabesques and panels with figures painted by Gibbon, of Coalbrookdale, upon the large vase (No. 4), present scarcely any new points of novelty in design. Their prototypes may be very fully found in the specimens of Italian pottery in the South Kensington Museum. The Gold Medals awarded both to James Meine (aged 22), and to Thomas E. Doran, are somewhat easily earned. James Meine's design for a carpet (No. 7), is carefully drawn and painted, and the different conventional motives, all of a quasi-Oriental type, are well distributed all over the surface; the colour, too, is not unpleasant. But, as a rule, our carpet-designers are so overruled by the exigencies of the machine, that, having designed a square yard of respectable pattern, it seems to be considered that they have done all that is necessary. To a different consideration, however, we may trace a leading element in the "style" of Oriental carpets. In such, large spaces are treated, and not a meagre square foot or yard. The design of pattern in an Oriental carpet is, as a rule, a composition to fill the space, and not a mere sequence of repeated details, repeated, in fact, until there is enough for the required surface. In respect of Doran's patterns for silk hangings (No. 2), they have a very decided likeness to French patterns for brocades of the early eighteenth century, and we could, probably, name a text-book on French textiles where the motives of most of the designs for silk submitted by the Macclesfield School could be found. Students should derive as much suggestiveness as possible from their studies of examples of ornament, &c.; but it is of questionable advantage to make palpable adaptations, if not direct copies, of old examples. And in regard to the courses of acknowledged studies of specimens of "historic" styles of decoration, we may note the many admirable sets of students' work. Frank Steeley (aged 18), of Birmingham, takes a Silver Medal for five sheets of details of wood carving, moulded work, &c., from Aston Hall (No. 26), a second Silver Medal is awarded to Francis Gibbon, of South Kensington, who has sketched (No. 27), a number of Japanese objects (some, especially the raised Satsuma ware, of doubtful taste and instructive utility). Of somewhat similar aim are the drawings done from actual measurement of buildings. Ullathorne, of Selby School, sends no less than twelve sheets of laboriously worked out details (No. 52) of the famous Abbey of Selby, giving elevations, sections, mouldings, plans, and what not, with extreme devotion. Others send measured drawings of the "Old Spa House," at Gloucester (No. 74), of the dining-room in "Carbrook Hall" (No. 132), of the north-west Tower of St. Paul's Cathedral (No. 259), of ornamental iron gates and other iron work at Edmonton, Aylesbury, Enfield, High Wycombe, and Homerton (No. 321). From this stage we pass on to the architectural drawings, the comparatively low standard of which, this year, is marked by the fact that a Silver Medal is the highest prize given, and that goes to Walter Catlow (aged 22), of Leicester, for some sketches, plans, and designs. A Bronze Medal is given to Hedley Price, of Nottingham, for a lavishly be-finialled and crocketed cathedral (No. 129), with great windows filled in, lavishly, with tracery work. Robert L. Hay (aged 19), of Glasgow, gains a Bronze Medal for his designs for a Municipal Building of an early Gothic style.

Hanging near at hand are designs for lace, and in these we notice a greater number for hand-made lace than usual. Miss Margaret Douglas's (No. 77) and Miss Emily Heise's (No. 91) designs seem to us to be the best after those (No. 29) by William Hardy, of Nottingham, who receives the Silver Medal in this class of work. The most successful design for wall-papers is that (No. 30) by Edmund Harral, who, with an orderly arrangement of fruits, leaves, birds, trophies of musical instruments, and pendent draperies in gentle tints of light yellows, pinks, and greens, seems to have adopted Mr. Walter Crane as his model. The remaining designs for wall-papers follow in conventional grooves, and there is little noticeable in them that is either fresh or peculiarly attractive. Designs for metal working come principally from Sheffield. They are for salt-cellars, candlesticks, address-caskets, soup-tureens, and jewellery. The rather top-heavy candlestick by Lawson (No. 108) gains a Bronze Medal. The style of this design is that identified with the late Alfred Stevens, whose consummate genius in dealing with plastic arts expressed in all materials, marble, terra-cotta, wrought or cast metal work, strongly influences many young students of the School of Art in his native town. Evidence of this may be traced in the bronze doors for a Town Hall (No. 149), by Winterbottom, for which a Bronze Medal is awarded. The framing and proportions of the doorway are suggestive of the famous door to "Paradise," by Ghiberti, at the Florentine Baptistery. The chief figure compositions are emblematical of Justice and Wisdom. The merit of the design lies in the fact that the character of the material adopted has been paramount in the exposition of the ornament. It is too often that ornament alone is invented and applied to a material instead of being of the material, in the true sense of the term. For instance, the Munich school of glass-painters are reproached with using glass, not as medium of translucence, not taking fullest advantage of the brilliancy which pure glass of different colours supplies, but reducing the glass to a semi-opacity or vellum appearance and then dealing with such a ground in the same way as one might deal with tinted paper. As coloured panels fairly illustrating Spenser's lines upon the seasons, the four figure designs (233) by Holgate, of the Westminster Royal Architectural School, are carefully carried out, and proper discretion in the lead lines is shown. But glass, as glass, does not proclaim itself here any more than it does in the Munich painted glass. A clever little Arcadian piper is depicted by Miller (aged 20), but the subject as a desultory "decorative" panel is no more technically "decorative" than is any little genre or other picture.

It is remarkable that the head school of all the schools of art, namely, the National Training School, with its Government subsidised scholars, at South Kensington, should not make a better display of designs. The highest awards go to students who are practising painting and modelling from the picture or sculpture point of view, and Richard Willis is the solitary student of the Training School who receives a Silver Medal this year for a design. Ten other prizes of lesser degree are awarded for designs to the South Kensington Training Class, and this out of a total of fifty-two awards. Reverting to the remarks we made above, that close upon one-third of the number of prizes gained by students of the provincial schools are gained in respect of designs, we may call attention to the fact that about a fifth only of the number given to the Training School at South Kensington are given for designs. It is surely to the Training School to which the country looks for its supply of masters who may be qualified to teach technical designing in all its branches. We may conclude our remarks by saying that the standard of skill in figure-drawing, modelling, and painting, and in painting generally, is, at this school, obviously higher than that required at the schools of the Royal Academy. A measure of the force which has secured this condition might, perhaps with appropriateness, be directed in favour of the primary intention of the artistic instruction given at South Kensington, namely, the improvement of artistic designing for all sorts of industries.

Books.—Amongst the books in the Hamilton Collection, sold last week were the following:—Androuet du Cerceau, Architectural Designs, a collection of fifty-five drawings on vellum, beautifully executed in Indian ink, bound in blue morocco extra, obl., 4to.—400*l.* (Quaritch). And. du Cerceau, "Petites Arabesques," forty-six plates, Aureliæ, 1550, sm. 4to., blue morocco extra, by Bozerian,—46*l.* (Quaritch). "De Architecturâ," fifty plates, by the same, with his "Opus alterum," sixty plates, and his "Livre d'Architecture," thirty-eight plates, three volumes in one, 1559, 1561, 1582, large folio, Thranus's very fine copy on large paper, in gilt vellum of that time. This rare volume sold for 260*l.* (Quaritch). "Le premier et second volume des plus excellents Bastiments de France," by the same famous architect and draughtsman, Paris, 1576-79, two volumes, large folio, Thuanus's copy of this first edition, old calf. The Bearzi copy sold for 650f. about thirty years ago, but this produced 165*l.* Another of Du Cerceau's works, "Livre des Edifices Antiques Romains," large folio, 1584, again from Thuanus's library, old calf, with his arms, slightly stained,—63*l.* (Quaritch).

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THE HAMILTON PALACE COLLECTION.

IT cannot be said that the Hamilton collection sale loses in interest as it progresses. It is not owing solely to what may be really called the extraordinary prices which some of the pictures, the furniture, and decorative objects have so far realised, as to the well-sustained character of the objects exhibited, and we have still the prospect of two other similar magnificent displays. Complete satisfaction may be said to have been given to all concerned. The National Gallery has been enriched by a number of rare and characteristic specimens of Italian art, and more than one collector at home and abroad has been made happy and famous by the acquisition of some of the coveted treasures of the Beckford and Hamilton gatherings. The competition which has so far been roused is scarcely likely to have its keenness dulled by the promise of the treasures yet to come, though expectation is amply compensated for by the exhibition which each week takes place before the sale.

The third portion of the collection, with its additional instalment of Italian pictures, rare foreign pottery, Limoges enamels and choice furniture revealed a further glimpse of the treasures which the palace contained. Never in England, it may fairly be said, since the days of the great sale of Charles I.'s effects have so many noble possessions been brought to the hammer as the Hamilton Palace sale will have dispersed, and never before has the skilled work of the decorative artist, the elaborator of choice woods, precious marbles, bronze, gold and silver, been brought into so immediate competition.—in commercial value,—with what is allowed to be the more lofty art of the painter. Within the last weeks Messrs. Christie's rooms have displayed an appearance such as we have been alone accustomed to see in the great palaces of the Continent and those of our own wealthiest nobility, with this rare exception that not an object has been exhibited that is not worthy of some kind of attention.

Notwithstanding the excessive beauty and value of many of the objects shown in King-street last week, it is not going too far to state that Masaccio's "Last Supper," a panel only 12 in. by 8 in., may be fairly said to have been the greatest treasure of the sale. If any doubt should exist regarding the authorship of this lovely little picture, let us allow the advantage of this doubt to rest with the painter of the Brancacci chapel, whose well-preserved perfect work in fresco at Florence exists to show how the decorator of a large wall-space can fully understand the conditions exacted. It is somewhat singular that one of the most famous pictures, as we incorrectly term Leonardo da Vinci's fresco of the "Last Supper," painted perhaps half a century after the Hamilton Masaccio, is now a ruin, whilst the same subject by the young Florentine master is absolutely in perfect preservation, and may exist for centuries to show not only a true method of painting, but also to instruct us in those eternal truths that the great painters of the past never failed to inculcate.

Almost as equally interesting as the small Masaccio is the large panel picture of the "Circumcision," by Luca Signorelli. When we consider that both these painters, Masaccio and Luca Signorelli, so well represented in the Hamilton sale, preceded that great artist Michelangelo, who undoubtedly owed not a little to the thoughtful labours of these earlier students, the interest that is attached to, and that we must all feel in, these two pictures, which now belong to the nation, is, it must be admitted, beyond commonplace expression. Of any collection it is something to say that it contains at least one genuine Correggio; that there are undoubted Titians, is even more to say; and those of the Hamilton collection are well known. The Antonello da Messina has long been quoted as one of the possessions of the collection. Works by the master who is said to have introduced oil-painting into Italy are of the extremest variety, and if the Hamilton portrait is not of the peculiar vigour of the Louvre treasure, it is of the utmost interest. The Bonifazio Bimbo is another variety of this exhibition, and would, indeed, in any collection be regarded as a treasure. Its preservation is remarkable, and its beauty of treatment and colour are of a character that we have been in the habit of finding alone in the best works of the best-known Venetian painters of the sixteenth century; the large "Jacob's Vision," by Bassano, is also a picture of merit by the great colourist; the portrait by Bronzino of "Garcia de Medici" is most interesting. The "Laughing Boy," by Leonardo da Vinci, is doubtless to many worthy the respect it seems to command, but in comparison with the great works of the master it is impossible to take more than a share of interest in this little work. The interesting portrait, acquired by the nation, and said to be by Titian, but in reality by Domenico Theotocopuli, claimed by the Spanish school as "*Il Greco*," but who, in fact, is a Venetian painter, is certainly an historical addition to our collection. The picture is not alone interesting from its being the work of an artist little known in England, but also as showing the methods by which the Venetians painted at the time *il Greco* was in Venice, though there is observable that spirit of caricature that is so often evident in imitators.

China collectors, whether intending or regretfully longing purchasers, had, during the view, a rich treat in the large quantity of curious old Dutch, French, and Italian faïence, delft, Rouen, Gubbio, and Urbino wares; several pieces of the richly-lustred Hispano-Moorish majolica. Venetian glass, too, though scarcely of the type which our modern makers have now made so familiar in their skilful copies; among the specimens two curious pairs of dark green altar candlesticks; by the side of the creations of Murano a rare and ancient piece of Oriental glass,—a ewer richly gilt and enamelled with quaint figures,—just such a specimen of Eastern skill as set to work the puzzled ingenuity of the founders of the beautiful trade which, for so many centuries, has made Venice famous.

To a very different order of decorative art belong the specimens of Etruscan pottery, among which the "Beckford Vase" justly attracted, during the show, no small share of curious attention.

As for the carvings in ivory, it is not often that such treasures are brought under the notice of the public in the sale-room. Criticism might well hover between the delicate little fifteenth century Gothic shrine and the two ivory carvings by Fiammingo,—as the Flemish artist Duquesnoy is generally called,—with their sturdy Rubens-like exuberance of life and strongly-marked Classic character. For the rock-crystal chandeliers there was, as may be imagined, no lack of admiration.

Among the pieces of furniture composing the third portion of the sale, the series of Boulle and Louis Seize marvels may be said to have been disturbed by the appearance of several superb specimens of sixteenth-century Italian work, Florentine cabinets in *pietra dura* mosaic, works almost of architectural merit and brilliantly arrayed in the harmonies of artistically arranged nature. One cabinet of sixteenth-century Milanese work, overlaid with damascened plaques and ablaze interiorly with rare and precious stones and marbles, jasper and lapis lazuli, scattered with the wildest profusion over the drawers, colonnettes, and panels, amply employed, during the three days' exhibition, one patient attendant to open and shut as the crowds passed by and admired. As for the so-called Soltykoff chess-table, of sixteenth-century Milanese damascene work, in the exquisite beauty of the execution,—manipulative and artistic,—of the architectural motives, it merits the reputation it has long borne in artistic circles. It bears well the historical traditions attached to it. The collection contained several other pieces of damascened work, among these a choice oblong steel coffer.

It is somewhat singular that the only modern work that we have observed in the sale should be by an American. Harriet, or "Hetty," Hosmer, as she is called, the well-known sculptor, the *protégée* of John Gibson. We well remember the execution in Rome of Miss Hosmer's first work which brought her into notice, the little "Puck" of the Hamilton sale. As for the colossal porphyry head of the Niobe and the Laocoon group in bronze, the size of the original, and such objects as the four large terminal busts in old Rouen faïence, they are possessions such as alone find their place in palaces. With regard to the faïence d'Oiron, the so-called "Henri Deux" ware, forming in its size and delicacy of ornament so complete a contrast to the porphyry busts, it can be understood, with the history attached to its production, how great was the interest excited by the two specimens on view last week in King-street. Of the thirty-five or so pieces known to exist in the world, these two of the Hamilton Collection form part. Of the delicate little salt-cellar,—only 4 in. high,—a positive architectural marvel of design, with its little colonnettes, panels, mouldings, and mascarons, if, as is the case, there exist two or three other variations of the design; the companion tazza, 4 in. high, though it somewhat resembles, except in the absence of a cover (which we suspect is wanting), a superb cup, in possession of the Baron Alphonse de Rothschild, is known to be unique; the happy possessor will thus have one more joy added to his treasure by the knowledge of this all-satisfying fact.

The pieces of Limoges enamel, most of which, it may be mentioned, were exhibited at South Kensington in 1862, attracted no small amount of attention, and very rare indeed are the specimens which the sale has now scattered; creations of artists such as the Limousins and Penicaud do not come often into the market in the present day, when the museums are gradually monopolising all such treasures of the past. Is it not, perhaps, better that this should be the case? and is it not a constant source of congratulation, both to the art-lover and collector? To art-lovers that the objects are thus for ever preserved, and easy of access and study; to collectors, because they are by this means for ever prevented from suffering the heart-burnings of seeing coveted treasures pass into the more fortunate hands of brother fanatics.*

THE LATE MR. J. A. HANSOM, ARCHITECT.

MR. JOSEPH ALOYSIUS HANSOM was born in the city of York, on October 26, 1803. In 1816 he was apprenticed to his father as a joiner; but in the following year, having shown an aptitude for designing and construction, his articles were allowed to lapse, and new ones taken out with Mr. Philips, an architect of some ability in York. The articles having been completed in 1820, he continued on as clerk to Mr. Philips, doing some small matters on his own account, and teaching a night school, in which latter occupation, while rendering service to others, he contrived to improve a somewhat defective education. It may be here remarked that Mr. Hansom was one of those men who never lost an opportunity of improving his mind, and would take up and study the most abstruse subjects.

On the 14th of April, 1825, he married Hannah Glinn, who died fifty-five years and a half later, and by whom he leaves surviving issue,—Henry John, an architect and district surveyor of Battersea, under the Metropolitan Board of Works; Joseph Stanislaus, a Fellow of the Royal Institute of British Architects, partner with, and successor to, his father; Sophia, married to Mr. George Bernard Maycock, and Winifrede Mary, the wife of Mr. George Edward Hardman. On the 14th of April, 1875, was kept the golden wedding, when all their children, their husbands and wives, and all their grandchildren, gathered around them.

After his marriage Mr. Hansom settled in Halifax, where he took a place as assistant to Mr. Oates, an architect, where, for the first time, he had the opportunity of working in the Gothic branch of architecture. In this office he made the friendship of Mr. Edward Welch, with whom in 1828 he went into partnership. Together they were engaged on a gaol and a terrace of houses at Beaumaris; churches at Toxteth Park, Liverpool; Acomb, and Hull (all gained in competitions); three churches in the Isle of Man; a dispensary at York, &c. In 1831 both Mr. Hansom and Mr. Welch sent in distinct

* At Saturday's sale the National Gallery acquired four pictures:—Masaccio's "Last Supper," for 600 guineas; the so-called Titian portrait, to which we have referred, for 320 guineas; "An Allegory," by Pontormo, for 300 guineas; and "The Circumcision," by Luca Signorelli, for 3,000 guineas. Mr. Doyle acquired for the Dublin Gallery the portrait said to be by Leonardo da Vinci, for 205 guineas; and the "Resurrection," by Bonifazio, 220 guineas. Titian's "Holy Family" fetched 1,150 guineas; the Bonifazio "Bimbo," 460 guineas; the "Antonello da Messina" portrait, 490 guineas; the Bronzino portrait of "Garcia de' Medici," 1,700 guineas; Leonardo da Vinci's "Laughing Boy," 2,100 guineas; Bassano's "Jacob's Vision," 200 guineas; "Venetian Admiral," by Titian, 590 guineas; a Correggio, "Ecce Homo," replica of that in the National Gallery, 260 guineas; the "Dying Magdalen," by the same artist, 310 guineas; a portrait of "Mary Queen of Scots," 350 guineas. On Monday, the Oriental glass ewer was sold for 2,730*l.*; the Beckford vase for 168*l.*; the Fiammingo ivories, 536*l.* and 162*l.*; the chandelier, 441*l.*; the Duc de Choiseul's writing-table and *cartonnière*, 5,565*l.*; the bust of Niobe, 409*l.*; the Laocoon, 504*l.* On Tuesday, the "Henri Deux" salt-cellar fetched 800 guineas; the *tazza*, 1,180 guineas; among the French faïence, a Nevers-ware ewer and dish fetched 145 guineas; the tazza of Limoges enamel, by Penicaud, was sold for 2,000 guineas.

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designs, but under the joint names, for the Birmingham Town-hall, and Mr. Hansom's design was declared the first in merit. Unfortunately he was called upon by the Town Commissioners to become bond for the builders, a position which, with other conditions, imposed by the Commissioners, eventually placed him in the position of builder as well as architect. He endeavoured to evade such an imposition; but no alternative was allowed but to throw up the work altogether, and, as he put it in a pamphlet issued in 1834, he "was, therefore, obliged to submit or forego the object of my ambition." The result was that he was landed in bankruptcy. In maturer years he always blamed himself for consenting to such terms; but it will readily be understood that to a young man the temptation to acquire reputation was very great.

Coming at such a time of life, the blow was a very heavy one to bear, and for some time he had to content himself with such small works as came in his way, until the late Mr. Dempster Hemming, of Caldecote Hall, struck with the amount of erudition and business aptitude displayed, put him in charge of all his affairs, which included banking, coal-mining, estate management, &c., which he carried on together with his profession. This engagement was to come to an unexpected end. The way Mr. Hemming's large fortune was dissipated is a matter of notoriety amongst readers of *causes célèbres*, and the intimacy came to an end, leaving Mr. Hansom none the better.

It was at Mr. Hemming's wish that Mr. Hansom perfected and brought out his idea for the "Patent Safety Cab." He took out a patent for this in 1836, and subsequently disposed of his rights to a company, the remuneration named being 10,000*l*. It is sad, however, to relate, as in the case of many another inventor, that the purchase-money was never paid. Having put the company in a going and paying state, he retired from the management with the double view of easing the company of expense and of devoting more time to his professional work. After this the company got into a bad state by mismanagement and excessive expenditure, and in 1839 he volunteered to put matters straight within the space of three years. This he did in half the time, and it is believed that for this work he received the sum of 300*l*., the only money he ever received for all his time, talent, and labour involved. Under his management many improvements were made in the cab as experience dictated. There were, as usual, claimants to the credit of such improvements. The principle of "safety" which he studied is quite lost in the so-called present "Hansom." This consisted in the suspended or cranked axle. The back seat was not in the original patent.

Appended to the patent is another idea for a cab which was to be entered through the wheel, but no use was ever made of it, as he saw that the construction was hardly likely to stand the strain of heavy traffic without unduly weighting the vehicle.

In 1842, it occurred to him that the building trades and professions were sadly in want of some channel of intercommunication and illustration, and on the last day of the year he brought out and founded the *Builder*. Want of capital forced him to retire from the undertaking, and he had to content himself at the end of a year with a small payment which the publishers offered him for his consent not to contest the right of proprietorship in the periodical. After this he devoted his energies almost entirely to the pursuit of his profession, being principally engaged on ecclesiastical and domestic work, mostly for Roman Catholics, he himself being a most devout member of that Church.

From 1854 to 1859, he worked in partnership with his younger brother, Mr. Charles Francis Hansom; from 1859 to 1861, with his eldest son; from 1862 to 1863, with Mr. Edward Welby Pugin, a union which had a disagreeable termination. At the beginning of 1869, he took his second youngest surviving son, who had been previously articled to him, into a partnership which lasted for eleven years, when, at his own request, he retired from the firm, retaining only a life interest in it. The last two years and a half of his life he devoted to the preparation for death, retaining all his mental faculties to the end, though sadly crippled in body. On June 29th, at a quarter past three, a.m., he calmly breathed his last, surrounded by the whole of his family, after receiving all the comforts which religion could afford him. He was buried on July 3rd, at the Catholic church of St. Thomas of Canterbury, in Fulham.

His character was one of much power, mingled with still greater gentleness. With strong ideas of his own, he would listen to, and weigh, the views of others with the greatest patience. He was painstaking in his work, carefully guarding the interests of his clients, but never with prejudice to justice. To the clerks and pupils under him he was full of kindness, and many there were who sought every opportunity of evincing the respect they entertained for him.

In addition to works already enumerated, he was professionally engaged on the following:—

St. Walburge's Church and Talbot Schools at Preston, and the enlargement of St. Ignatius's Church in the same town; the Catholic Cathedral, Bishop's House, and Convent of Notre Dame, at Plymouth; a church at Devonport; the Church of St. François de Sales, at Drecquenecque, Boulogne-sur-Mer, as well as the adjoining Convent, and the little Pilgrimage chapel of the "Saint Sang" or Precious Blood, on the Route de Paris; the magnificent Church of Our Lady and St. Philip Neri, at Arundel, for the Duke of Norfolk, for whom he built several houses at Arundel, and restored and enlarged Derwent Hall, near Sheffield, adding the beautiful Early-English Domestic Chapel. He also designed the Jesuit Church in Manchester, dedicated to the sacred name of Jesus; and the Church at St. Marychurch, due to the munificence of the late Mr. J. P. Chatto, and which forms part of the group with the Dominican Convent, the Orphanage and Presbytery. The following churches and chapels owe all or much of their beauty to his prolific pencil, — all Catholic, — Hartlepool, Leeds, Chesterfield, Teignmouth, Mount St. Mary, near Chesterfield; Ripon, Torquay, Bedford-Leigh, Ryde, Clitheroe, Clifford, Prescot, Alston-lane, Dalkeith, Lymington, Leith, Howden, Gunnerset, Selby, Madeley, Dornie, Glassburn, Glasgow, York (St. George's), Simpleforth, Darlington, Weston-super-Mare, Cheltenham, Derby, Walsingham, Liskeard, Abbotsleigh, Minster Acres, Leicester, Easingwold, Nuneaton, Atherstone, Princetown, Gravesend, the Servite Church in Fulham-road, Oxford; Chideock, Wakefield, Newtownards, Taghmore, Solihull, Dartmouth, Lulworth, Portland, and Dundee. He was at different times engaged on convents at Darlington, Preston, Derby, Atherstone, Glasgow, Edinburgh, St. Marychurch, Dundee, Abbotsleigh, and part at Teignmouth; colleges at St. Asaph, Ampleforth, Mount St. Mary's, part of Ushaw and Beaumont Lodge, and the conversion of Fort Augustus into monastery, college, and hospitium, which is a marvel of contrivance. Also, Lutterworth Town-hall, a workhouse at Hinckley, inns at Grimston, Beaumaris, Strensall, Tadcaster, and Leicester; an insurance office in York; a model farm at Ushaw, and another for Sir Samuel Crompton; a bank at Atherstone; a trainer's house for Sir Richard Bulkeley; schools at Great Harwood, Preston, Chorley, Accrington, St. Helen's, Wigan, Prescot, Derby, Leicester, Brompton, Hammersmith, Mount St. Mary's, York, Blackburn, Liverpool (2), Bradford, Selby, and Glasgow. The spire of the Catholic church at Brook-green, Hammersmith, is also his; and it may be here stated that the spire of St. Walburge's Church, Preston, is 306 ft. high.

Amongst others he built or made extensive additions to the following mansions or residences:—Lartington Hall, for the Rev. Thomas Witham; Lulworth Castle, for the late Mr. Edward Wild; Danby Hall, for the late Mr. Simon Scrope; Cheeseburn Grange, for the late Mr. Edward Riddell; Thornburgh House, Leyburn, for Mr. Francis Riddell; Minster Acre, for Mr. Henry Englefield Silvertop; Brandsby Lodge, for Major W. Fletcher Gordon; Bishopsteignton, for Mr. John Robin; Beaufront, for Mr. William Cuthbert; Croston, for Mr. de Trafford; one near Leicester, for Mr. Turville; at Hinchley, for Mr. Harris; St. Asaph, for Sir John Williams; and others at Hutton-Aubo, Strangways, &c.

Other works of his are dotted over the United Kingdom, and designs of his were carried out in Australia and South America.

Textile Industry.—Mr. B. H. Thwaite, F.C.S., suggests the formation of a British Society of Textile Industry, on the model of that at Mulhouse, which has undoubtedly had a beneficial influence on the industries of Alsace.

DIVERSION OF THE SEA-BORNE TRAFFIC OF THE THAMES.

How much time, temper, and money would be saved by the simple rule, that people should first try to understand what they want, and then say what they mean. It is true that a certain trade that has thriven much of late would be extinguished by such a course; but the country could afford the loss. The meeting of the workpeople interested in the river trade of the Thames, on the 29th ult., most signally illustrates the above remark. What did the promoters of the meeting mean? If it was what they said, their meeting was unnecessary. Every one will agree with them, in spite of the inadequacy of the arguments of their chairman. If they meant something else, what was it? The meeting was professedly called to oppose the erection of a bridge over the Thames to the east of London Bridge, It did so on account of the damage that would be caused by stopping the trade of the river. Any stoppage of that trade every Londoner ought to do his best to oppose. But who proposes to stop it? No one, as far as we are aware. Was there any thing further in the mind of the meeting?

That a direct communication from the north to the south bank of the Thames, east of London Bridge, is a crying need, there is no contradiction. One question is open. What is, all things considered, the best mode of effecting this? The only possible modes are three, to each of them there is a certain amount of objection. Which is the least obnoxious?

The three possible modes,—for the convenience of a steam ferry has not adapted itself to the wants of the locality,—are, a swing or otherwise opening bridge, a bridge so lofty as to allow the river traffic to pass unimpeded below it, or a tunnel. We are not about to enter into the discussion of a question which must be settled on scientific data, and after the preparation and comparison of careful plans, estimates, and tables. But we do not suppose that there was any one at the meeting more prepared than we are at this moment to offer any opinion on the subject. What was the purpose, then, of the assembly? To maintain the undisturbed freedom of river transport? Well and good. It is more than a desideratum, it is a necessity. Will the meeting have any effect in making this more certain?

But there is an ancient and subtle enemy to all improvement, who gives himself the well-sounding name of Vested Interest. On one pretext or another Vested Interest always opposes any plan for the cheapening of the supplies of life, or for the improving the condition of any class, or of any set of individuals. And there were one or two remarks allowed to slip out in the account of the meeting that looked as if it had been called by this disguised but busy individual. Nothing was to be done to interfere with the manner in which any of the waterside industrials gained their living. Now, bridge or tunnel, any direct and constantly available communication from bank to bank, would touch Vested Interest. Boatmen, for instance, might suffer from not being required to ferry over passengers. If this be so, if there be any honest industry that would suffer from a great metropolitan improvement, it may be fair to urge that some compensation is due. That is a matter to be discussed on its merits; but let it be openly so discussed. Do not let boatmen be called together, or call other workpeople together, to complain that the river traffic will be displaced, when they mean that they will have less occasion to row across the Thames. The ridiculously inadequate statement that London would lose 25,000*l*. by the displacement of her river traffic is enough to show that the persons who conducted the meeting were not altogether the most competent to express opinions on the land and water traffic of London.

Portobello.—New buildings in connexion with the Portobello Co-operative Society have been formally opened by Bailie Buchan. The buildings, which are three stories in height, are built of stone. On the ground floor are two large shops with a saloon behind, and on the sunk flat is a bakery, which has been fitted up with all the latest improvements. The two upper flats consist of workmen's dwelling-houses. The buildings, of which Mr. James Simpson, Leith, was the architect, are estimated to cost 3,500*l*.

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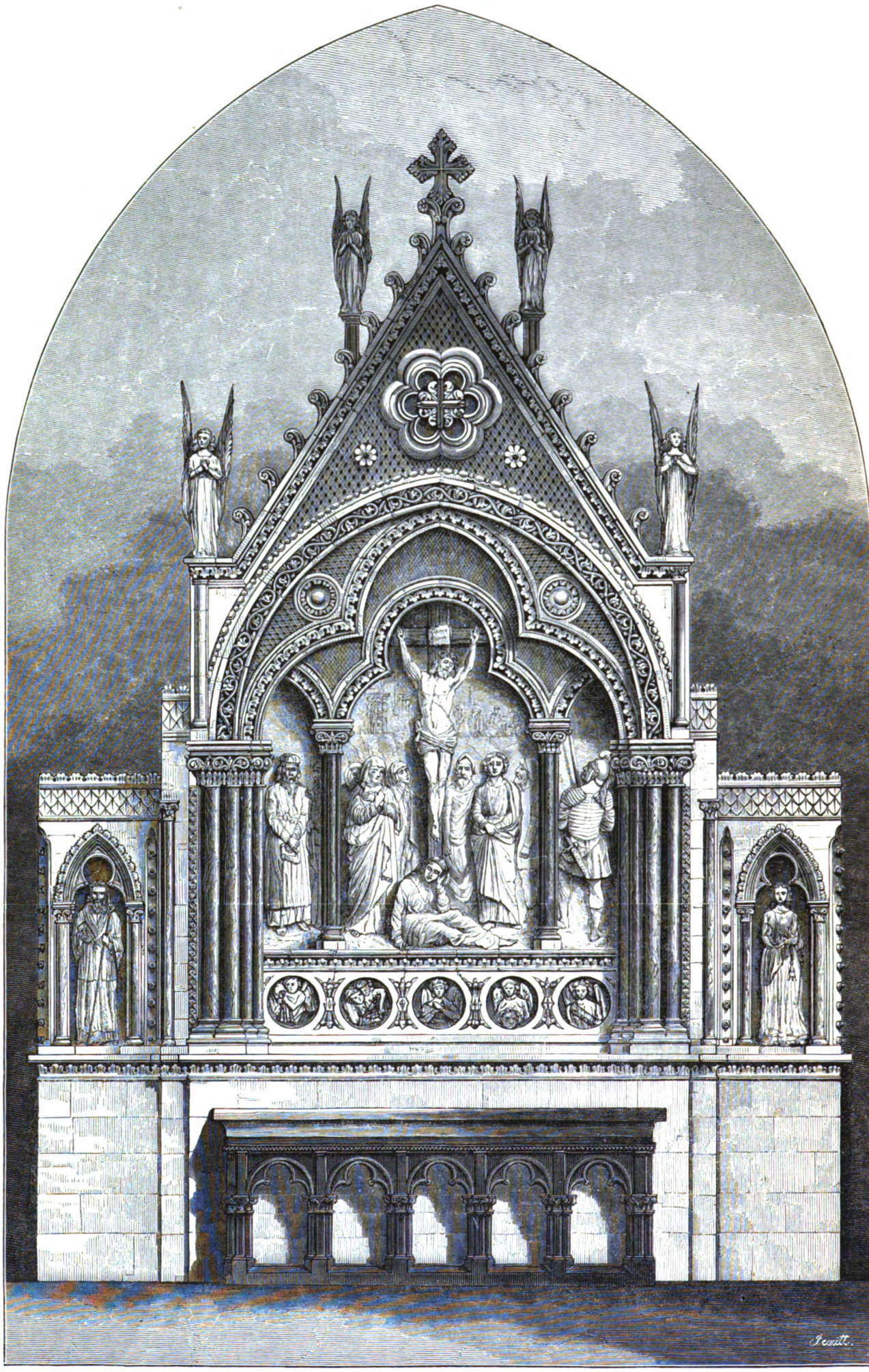

REREDOS, EDINBURGH CATHEDRAL.—MR. J. OLDRID SCOTT, ARCHITECT.

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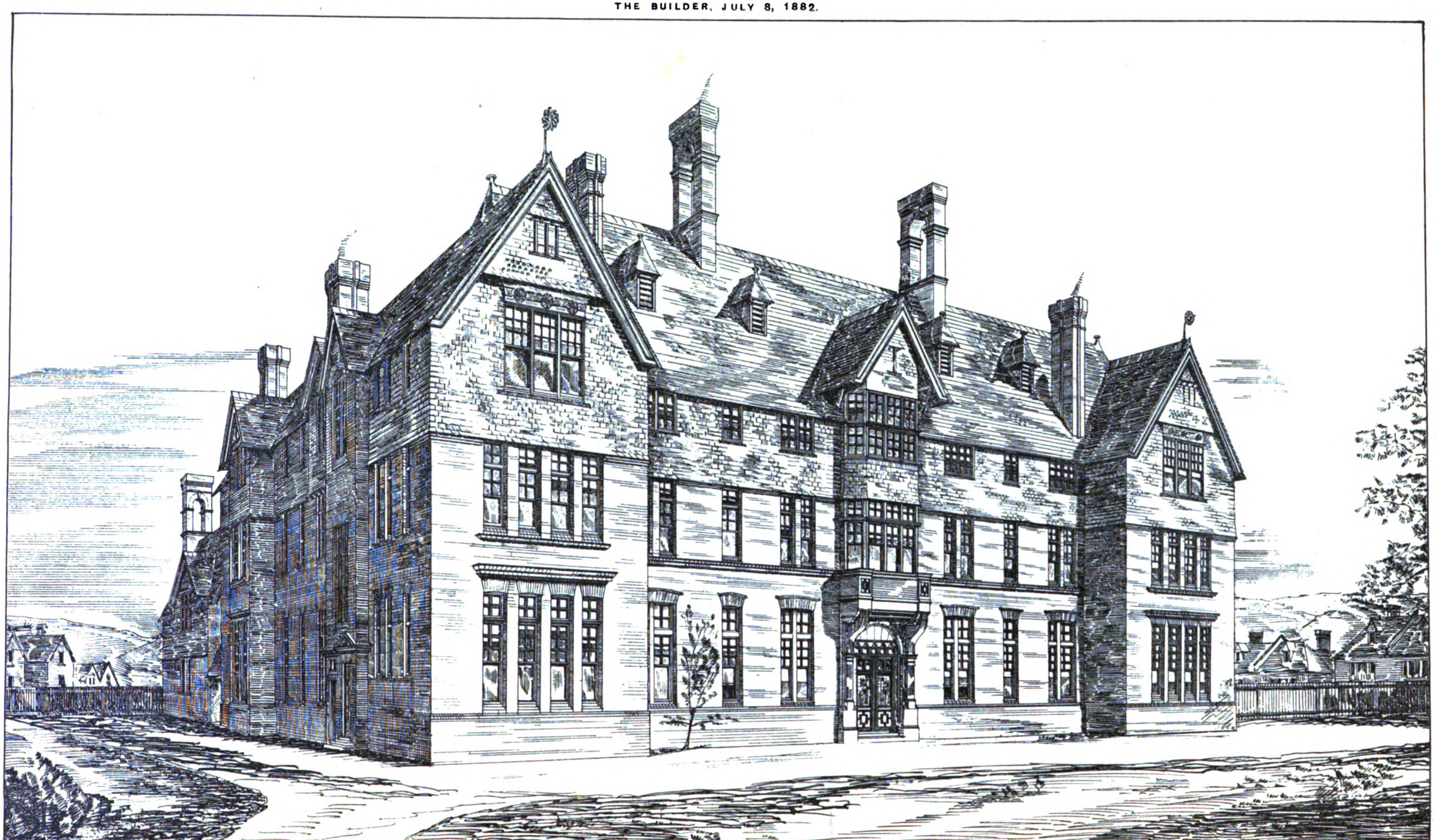

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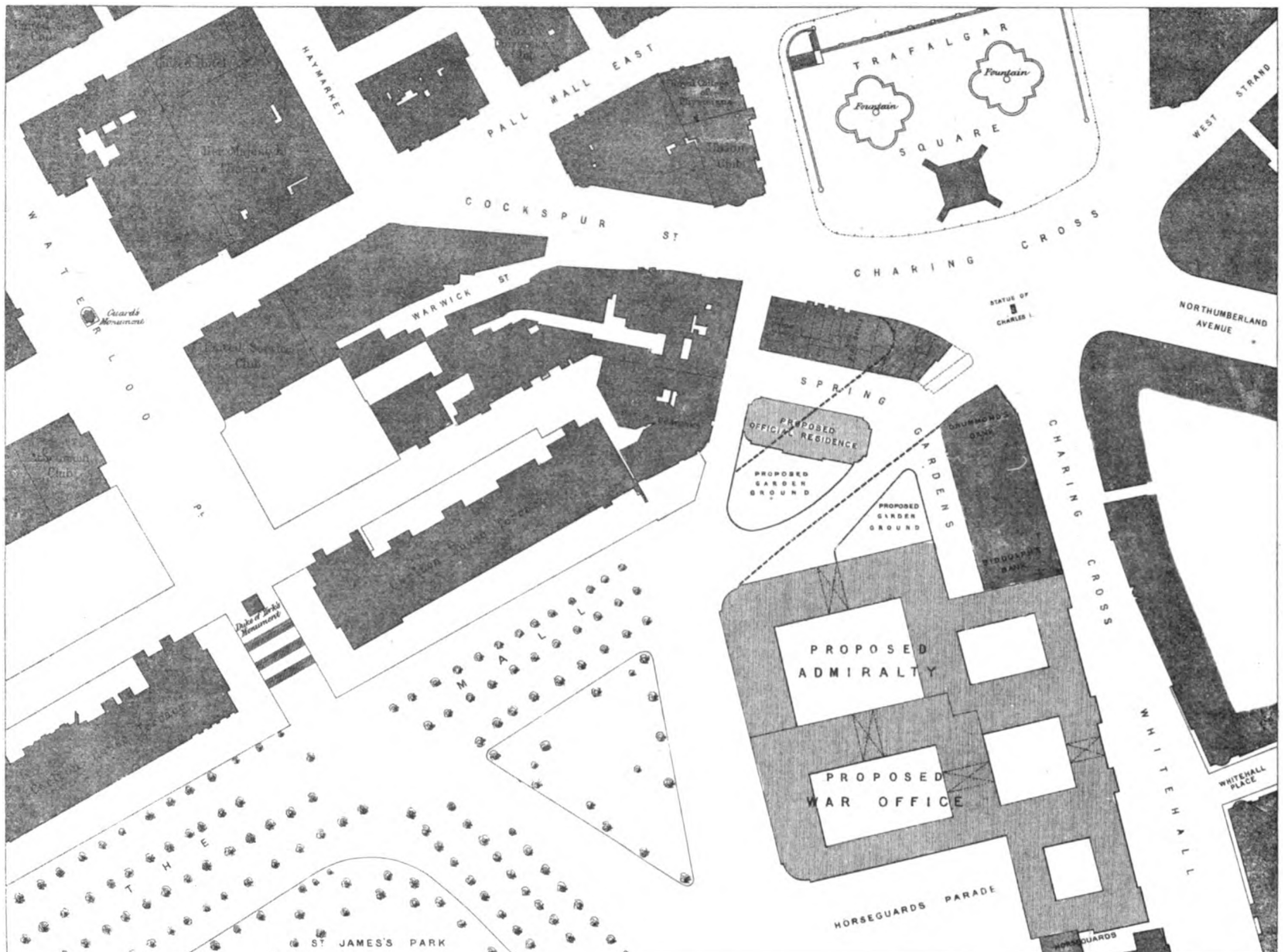
PUBLIC OFFICES SITE BILL; OFFICIAL SCHEME OF NEW BUILDINGS FOR THE ADMIRALTY AND WAR OFFICE.

(AS PROPOSED TO BE COMPLETED BY H M. OFFICE OF WORKS AND PUBLIC BUILDINGS.)



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** THE SUGGESTION MADE BY THE COUNCIL OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS FOR THE PROLONGATION AND OPENING-UP OF THE MALL (AS AN ESSENTIAL ELEMENT OF THE SCHEME) IS INDICATED BY BLACK DOTTED LINES.

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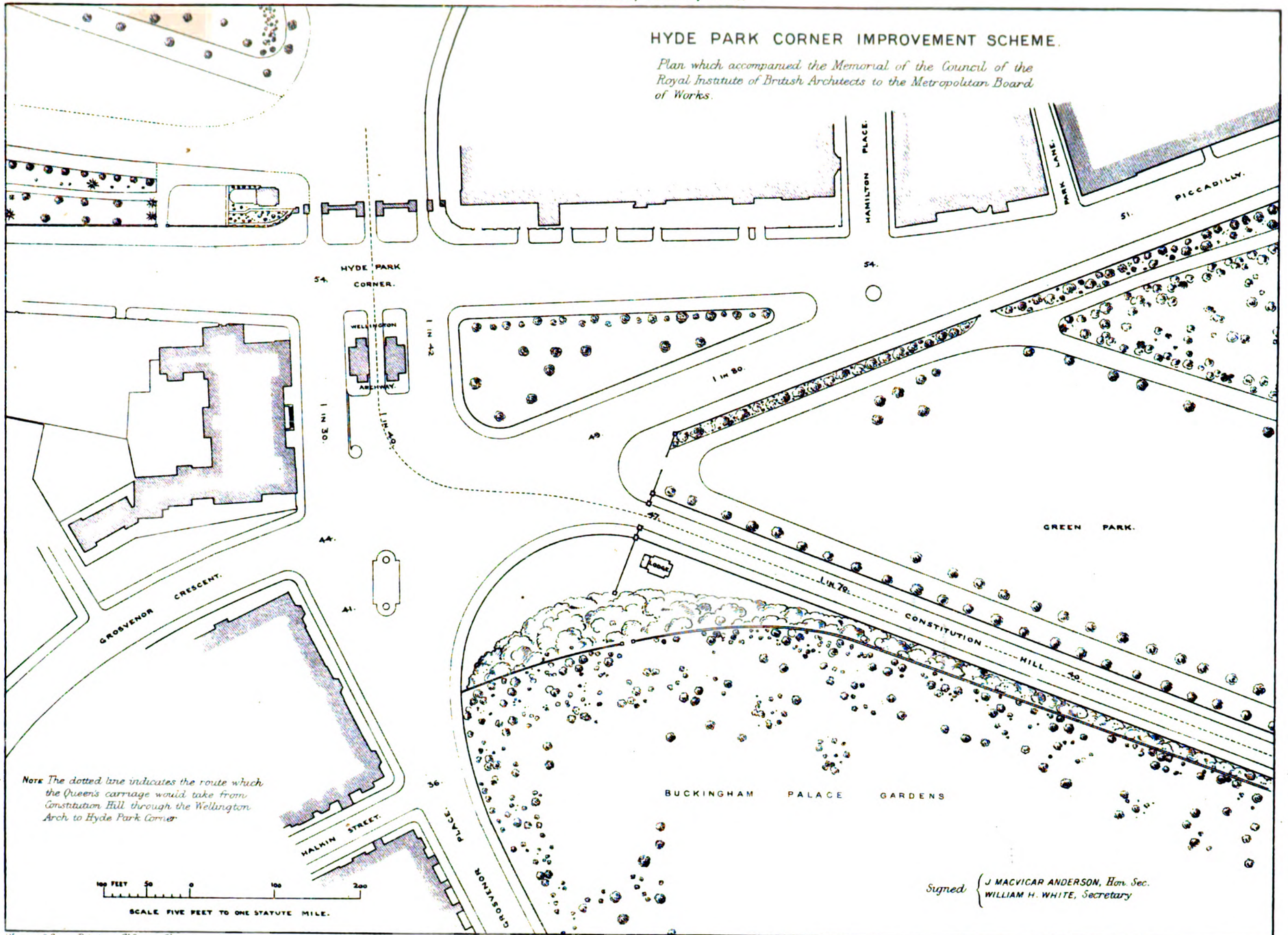
HYDE PARK CORNER IMPROVEMENT SCHEME.

Plan which accompanied the Memorial of the Council of the Royal Institute of British Architects to the Metropolitan Board of Works.



Note The dotted line indicates the route which the Queen's carriage would take from Constitution Hill through the Wellington Arch to Hyde Park Corner.

Signed { J MACVICAR ANDERSON, Hon. Sec.
WILLIAM H. WHITE, Secretary

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RESIDENCES, COXWELL-STREET AND THOMAS-STREET, CIRENCESTER.—MR. JOHN BIRCH, ARCHITECT.

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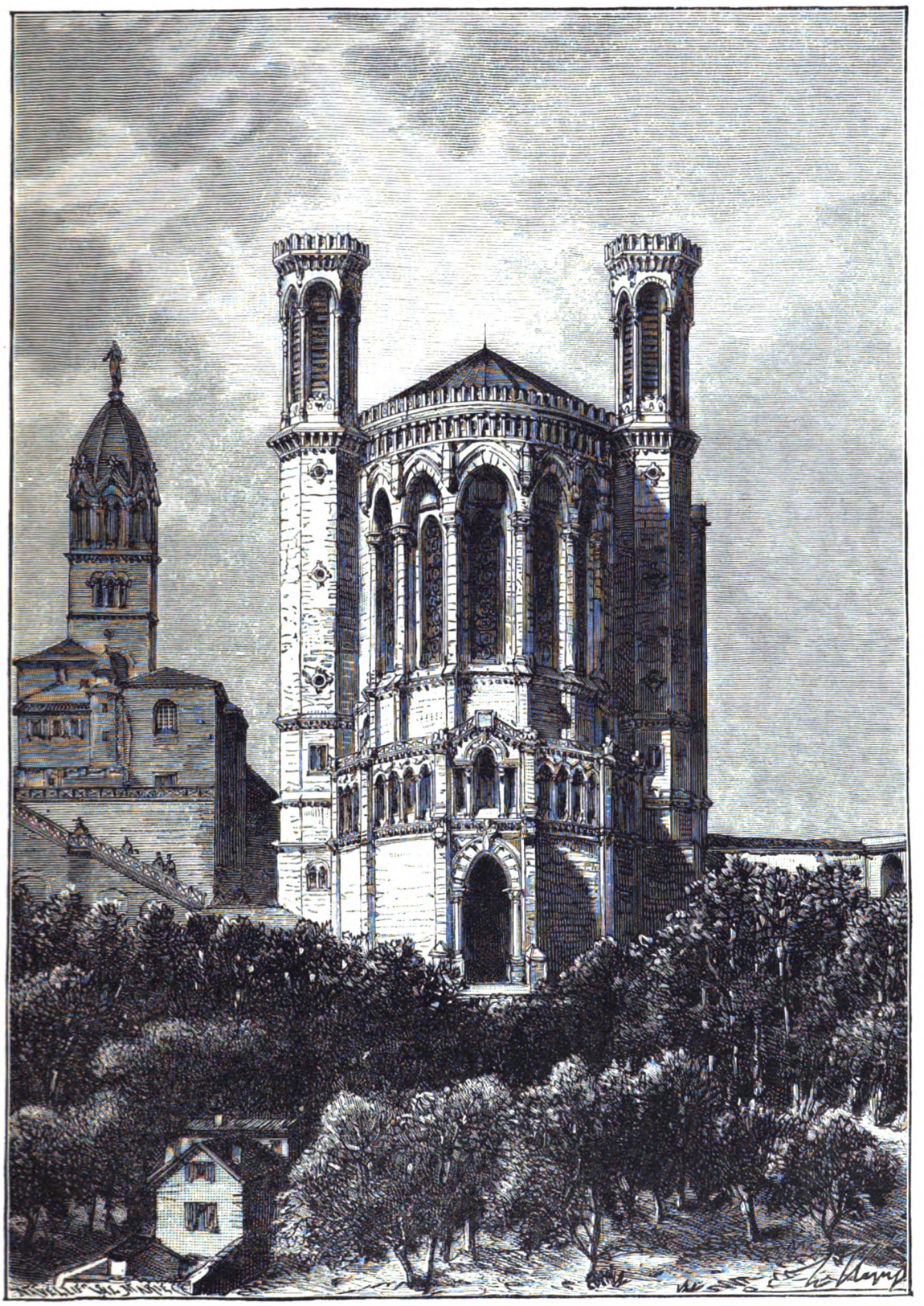

THE NEW CHURCH AT FOURVIÈRES, LYONS, FRANCE.

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REREDOS, EDINBURGH CATHEDRAL.

WE give a view in our present number of the new reredos at Edinburgh. It was erected at a cost of 1,200*l*., exclusive of sculpture, by the ladies of Scotland, and was executed by Mr. Brindley. The carving is especially good; it is to a great extent founded on some beautiful fragments of Transitional work found at Bridlington, forming parts of a very elaborate cloister. It is all of alabaster, with enrichments in marble mosaic. The design is for the most part that of Mr. J. Oldrid Scott, based on his father's (Sir G. G. Scott) original sketch.

The sculpture is by Miss Grant, the niece of the late president of the Royal Academy,—the subject being the Crucifixion. Other figures are introduced in niches.

The reredos is on a fine scale, and has a striking effect on the interior of the cathedral.

THE NEW CHURCH OF FOURVIÈRES, LYONS.

THE Church of Fourvières is well known at Lyons: situated on a hill on the right bank of the Saône, to which many roads lead, it owes its name to the Roman forum, remains of which were found at this place. It is in the Romanesque style. The interior, which offers nothing remarkable to describe, is hung with gifts from all parts of France. It is, in fact, a celebrated place of pilgrimage. So great is the number of persons who resort to the spot that the present new church has been built by the side of the ancient one, the effect of the group being very good. Apart from the pilgrims, numerous tourists visit the spot, and there is something like a small fair carried on in the neighbourhood. The views of the country from this elevated spot are splendid, and telescopes abound.

RESIDENCES, THOMAS-STREET AND COXWELL-STREET, CIRENCESTER, GLOUCESTERSHIRE.

SOME old buildings in Coxwell-street and Thomas-street having been pulled down, are now being rebuilt in the style of the Domestic architecture of the sixteenth century, in order to harmonise with other improvements effected in this quaint and old-fashioned town during the last few years. The residences are being built of the local rubble-stone so frequently used in this stone district, having Box-ground Bath-stone dressings to doors, windows, chimney-heads, &c. The roofs, which are partially concealed by parapetting, are covered with slates well flashed with lead. Each residence contains a sitting-room, parlour, kitchen, three bedrooms, and the usual offices. The works are being executed by Messrs. J. B. & E. D. Bridges, of Cirencester, who restored the mansion-house, stables, &c., under the direction of the architect, Mr. John Birch, of John-street, Adelphi.

MISSIONARIES' COLLEGE, SEVENOAKS.

THIS building, known as Walthamstow Hall, was lately opened by Mr. Morley, M.P., and we then gave some particulars of it. We now add a view, and for convenience sake repeat part of the description. The building, which was erected under the direction of Mr. E. C. Robins, F.S.A., architect, is situated in Holly Bush-lane, between the Vine Hall estate and Knole Park, on the brow of the hill overlooking the latter. It is built in the prevalent old English style, with red brick and ornamental tile facings, and tile roof-covering, the entrance doorway being of red Mansfield stone, and a bay window rises above it two stories in height.

The grounds are laid out for lawns, gravel walks, and playgrounds, and for kitchen gardens, and are entered by ornamental gates, presented by Mr. E. Pye-Smith, of St. Pancras Iron Foundry. The lodge is not yet erected.

The dining-hall is opposite the entrance-hall in the centre of the quadrangle, and has an open-timbered and panelled pitch-pine roof. The rest of the open quadrangle is occupied by the lavatories and cloak-rooms, fitted up and heated with warm-water pipes, with which the dining-hall and all the corridors are warmed, open fires being provided for the rooms generally.

The kitchen block incloses the north side of the quadrangle and is of two stories, and has servants' dormitories on the first floor. The kitchen in the centre occupies two stories. Adjoining which are the scullery, larder, pantry, bread and other stores, the housekeeper's room and store-room, and the cooking school.

The first contract for the foundations and drains was taken by Messrs. Punnett & Co., and cost 1,400*l*. The next contract for the carcass of the main building and dining-hall was taken by Messrs. Willicombe & Oakley, and cost 6,300*l*.

The same firm completed the whole building, and laid out the grounds and fenced in the land, at a cost of about 10,000*l*.

The names of the various tradesmen employed we have already given.

THE HYDE PARK CORNER IMPROVEMENT SCHEME.

WHY REMOVE THE WELLINGTON ARCH?

ON Friday, the 30th ult., a deputation from the Council of the Royal Institute of British Architects (consisting of Mr. Horace Jones, president, Mr. David Brandon, vice-president, Mr. E. I'Anson, vice-president, Mr. J. T. Knowles, Mr. Octavius Hansard, Mr. J. Macvicar Anderson, hon. sec., and Mr. William H. White, secretary) waited upon the Metropolitan Board of Works, Spring-gardens, to present a memorial on the subject of the projected improvements at Hyde Park Corner. The deputation having been introduced by Mr. Dalton, the clerk read the memorial, which was as follows:—

To the Chairman and Members of the Metropolitan Board of Works.

MR. CHAIRMAN AND GENTLEMEN,—In compliance with your request that our deputation, which you have kindly consented to receive, on the subject of the proposed improvements at Hyde Park Corner, would be provided with a memorial setting forth the points it is desired to bring under the notice of the Metropolitan Board, we are directed to state that the Council of the Royal Institute of British Architects, having been led to consider the Improvements scheme of the First Commissioner of Her Majesty's Works by Sir Harry Verney's notice of motion on going into Committee of Supply in the House of Commons, and having devoted much attention to the whole subject, venture to express their opinion that, while the general idea of the scheme merits public approval, it is defective in two main particulars, viz.:—

(1.) Inadequate provision is made therein for the relief of public traffic.

(2.) The removal of the Wellington Arch is unnecessary.

In respect to the first point, the scheme of the First Commissioner, while affording relief for the congestion of traffic at Hyde Park-corner, does nothing to ameliorate the block of traffic at the junction of Piccadilly and Hamilton-place, and, in the opinion of the Council, no scheme is worthy of adoption which does not provide an efficient remedy at that spot. The suggestion which they have accordingly made is the continuation westwards of the straight line of Piccadilly, beginning to increase the width of the road opposite to Park-lane, and doubling its width at the foot of Hamilton-place. This line of road would debouch exactly opposite Grosvenor-crescent, and the approach to Belgravia from the east would thus be spacious and handsome, being nothing less than the prolongation of Piccadilly in a straight line westwards. Thereby the whole of the traffic from Victoria Station and Belgravia going eastwards, and *vice-versâ*, would be separately provided for; it would thus be conducted to and from Piccadilly without at all interfering with the traffic to and from Hamilton-place. The Council lay great stress on this point as an essential element in any scheme for facilitating the requirements of public traffic in this part of London.

Respecting the second point, the Wellington Arch in its present position is well placed, forming, in conjunction with the opposite screen at the entrance to Hyde Park, a symmetrical and not ineffective whole. But, placed where the First Commissioner proposes, it would be on a lower level than Piccadilly, central with no adjacent building, and valueless as part of an architectural group. A reference to the model prepared by her Majesty's Office of Works will demonstrate that it is practicable, as far as levels are concerned, to leave the Arch where it now stands, and to reserve the central roadway passing through it for the exclusive use of the Queen. There appears, in fact, to be no valid reason for removing the Arch, and, if this be so, it is surely unnecessary to incur a large expenditure for the purpose of placing the Arch in a less desirable position than the one it now occupies.

We are further instructed to submit herewith a plan illustrating the points to which the attention of the Metropolitan Board of Works is directed by the Council of the Royal Institute of British Architects, and soliciting, in their name, your favourable consideration, we have the honour to be, Mr. Chairman and gentlemen, your most obedient, humble servants,

J. MACVICAR ANDERSON, Hon. Sec.
WILLIAM H. WHITE, Secretary.

P.S.—The Council present an alternative plan which in a somewhat different manner accomplishes the two objects they wish to impress on your honourable Board, and which has the advantage of retaining more of the Green Park.

WILLIAM H. WHITE, Secretary.

Mr. Horace Jones (the President of the Institute) addressed the Board on behalf of the deputation, and handed in the plan which we publish, and which, he said, would explain the proposals embodied in the memorial. The Institute had no desire to be discourteous in their criticism of the scheme that had been promulgated by the First Commissioner of Works, but the matter having been brought before them, the Council of the Institute had given it very careful consideration, and it appeared to them that the same advantages, and even greater advantages, than would be obtained by the carrying out of that scheme, might be secured, and a saving of 15,000*l*. or 20,000*l*. effected. He asked that a representative or representatives of the Institute might be allowed to attend a committee of the Board, and explain in detail a general outline of the suggestions which were given in the memorial.

The Chairman asked the deputation if they were aware that this proposition for an improvement at Hyde-park-corner was a Government scheme.

Mr. Horace Jones.—Yes.

The Chairman asked further if the deputation were aware that the Board had promised a contribution towards the cost of carrying out the proposals of the Government.

Mr. Horace Jones said he was not aware that it was absolutely settled, and he hoped that the matter might be reconsidered.

The Chairman said the Board had definitely promised to give a certain contribution towards the cost of this scheme, and the subject was down for discussion in the House of Commons that evening. How, then, that being so, could the Board break faith with the First Commissioner and the public by considering a fresh scheme?

Mr. Horace Jones said the public criticised the actions of the Metropolitan Board, and, therefore, perhaps it would be better, even so late, to look at this suggested scheme. Nothing had yet been begun, and an inspection of the plans might prevent their finding out later that they had made an error.

The Chairman asked if it would not have been better for the deputation to have waited on the First Commissioner of Works.

Mr. Horace Jones assured the Board that the deputation attended in no hostile or antagonistic spirit. They simply thought that a better and cheaper mode of accomplishing the objects in view might be adopted than by carrying out the scheme of the First Commissioner, and they submitted their suggestions for the consideration of the Board. He subsequently added that a deputation from the Institute waited upon the First Commissioner on the previous Tuesday, but that they had not succeeded in making that impression upon him in favour of their views which they should have liked to do.

The Chairman said he might inform the deputation that this subject had been before the Board for ten or twelve years past, and certainly it had had full consideration.

Mr. John Jones asked the deputation if by their plan a better gradient would be provided than by the plan of the Chief Commissioner.

Mr. Horace Jones.—Yes.

Mr. Selway said he thought it very desirable that the whole Board Committee should have an opportunity of inquiring into the merits of any suggestions that might be brought forward; and although the Board had had the subject before them for many years, if a scheme was propounded which was an improvement on every former one, he thought they should give it consideration, and even ask the First Commissioner to adopt it. He moved that the memorial be referred to the Works and General Purposes Committee for consideration and report.

Mr. Dresser-Rogers seconded the motion. A deputation from so influential a body as the Royal Institute of British Architects was entitled to be treated with courtesy, and to have their representations fully considered.

Mr. Fowler said he very much regretted that the Board did not have before it at an earlier

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date the plan now submitted by the deputation, because it showed how all the objects of the improvement might be obtained in a better manner, and at a very much less cost.

Mr. J. Jones (who provoked some laughter by saying that the Board was responsible for the "ornamental condition of this metropolis"), Mr. Runtz, Mr. Freeman, Lord Frederick Fitzroy, and Mr. Lloyd also spoke on the subject, and in the result the motion was agreed to.

THE PROPOSED MANCHESTER SHIP CANAL.

THE gentlemen interested in the scheme for constructing a tidal waterway from Liverpool to Manchester have, as we are happy to learn from the *Manchester Guardian*, taken the advice which we ventured to urge on their attention (vol. xlii., p. 764). A large and influential meeting, comprising, among other members, the Mayors of Salford, Ashton, Warrington, Macclesfield, Stockport, and Staleybridge, was held on the 27th ult., at the Towers, Didsbury, the residence of Mr. Daniel Adamson. Mr. Fulton, engineer, who has devoted his attention to the scheme in question for many years, explained his plans to the meeting. Mr. Hicks brought forward a number of figures, chiefly explanatory of the statistics of the exports and imports of Manchester. It was resolved, on the motion of the Mayor of Salford, to appoint a provisional committee for the purpose of inquiring into the best means of carrying out the project, and nine gentlemen were named to compose the same. And, finally, a resolution was carried that the provisional committee be empowered to obtain a detailed survey by a competent engineer or engineers, for the purpose of ascertaining approximately the cost of the construction of the proposed tidal navigation. This adoption of the recommendation, "Let Manchester take the best advice on this vital point," is so far eminently satisfactory, and relieves us from the necessity of saying much that otherwise might have been of use.

Mr. Fulton's speech does not add very much to the information which we collected and laid before our readers on the 24th ultimo. He said that the tidal range at Manchester would be 15 ft. at spring, and 12 ft. at neap, tides, but did not state why it should be expected to be so much less than the Liverpool range of 27 ft. 6 in. He gives nearly the same figures as to excavation, &c., that we had done, and added that the area proposed for the dock was 128¼ acres. This, however, according to the figures which we previously gave, would only provide accommodation for about 2,000,000 tons of shipping, whereas Mr. Hicks took credit for 5,000,000 tons. The approximate estimate was raised from 3,500,000*l.* to 4,500,000*l.* The proposed charge of 3s. a ton on the traffic which the dock would accommodate would amount to 300,000*l.* per annum, 75 per cent. of which would amount to exactly 5 per cent. on the larger sum. Thus, while restricting a too sanguine estimate, it is evident that there are the elements of an important enterprise. The true question, as we said before, is not whether the scheme is possible, or even whether it may be expected to pay a fair dividend, but rather, is it, all things considered, the best for Manchester? And it is to that point, we would venture to reiterate, that the advice which the provisional committee are empowered to ask should, in the first place, be mainly directed.

The chairman apparently referred to our previous remarks as to the difference between the proposed scheme and the cases of the Clyde and the Tyne, but he said nothing to impair their force. The comparison of the Suez Canal is not a very satisfactory one, as there is little similarity between a cut from sea to sea,—in which, as will be seen by reference to plate 12 in Mr. Vernon Harcourt's newly-published book on rivers and canals, excavation of any depth is quite the exception,—and nineteen miles of continuously deepening cutting from the estuary to Manchester. The main feature of the Suez Canal is that it follows the level of the district through which it runs,—contrary, it may be added, to the advice of Mr. Stephenson, who proposed that it should be varied above that level, and fed from the Nile. The main feature of the Manchester Canal is that it is to run on at a level through a country gradually rising to some 100 ft. above the bottom of the artificial channel. The one question is,—where will it be cheapest and best for Manchester for the water ladder to be built? And it is to this part of the question that the consideration of the Provisional Committee will, no doubt, in the first place be wisely directed.

EXHIBITION OF APPLIANCES FOR SAVING LIFE.

ALEXANDRA PALACE.

THERE is now open, at the Alexandra Palace, a large and interesting exhibition of means and appliances for the protection and preservation of human life. It contains much to interest everybody, and is well worth visiting, although its promoters do not appear to have shown that amount of energy and aptitude which the exhibitors and the public have a right to expect from them. For instance, the exhibition was, after several postponements, opened on Saturday last, without, apparently, much effort being made on the occasion to attract the attention of the public to its importance; and three days after the opening no catalogue was obtainable. Nevertheless, the exhibition is well worth visiting.

An exhibit which will have special interest for our readers is Messrs. Archibald Smith & Steven's new hydraulic-balanced lift for passengers. Accidents by lifts are of such frequent occurrence, and are so often attended with loss of life or permanent injury to the persons using them, that all improvements in the direction of attaining absolute safety in the use of such appliances are cordially to be welcomed. Messrs. Archibald Smith & Stevens claim that in their new hydraulic lift (which is shown at work in the exhibition) they have attained to this *desideratum*, and their claim appears to be well founded. The ram is so proportioned that the pressure of water beneath it will suffice to raise the load, together with ram and cage, without the latter being counterbalanced, and without the use of any weights, chains, or overhead gearing. We have not space to describe the lift in detail, but we may say that the water used under pressure for actuating the lift may be considered as being in two sections, one section exerting its force to raise the load, and the other section assuming the duty of the balance-weight, and raising the dead weight of ram and cage. The water which is borrowed for lifting the dead weight of ram and cage is returned to the accumulator on the descent of the lift, and thus economy of working is combined with safety. Architects and building-owners will do well to examine the merits of this new lift, six of which are, we understand, about to be supplied by Messrs. Smith & Stevens to the Royal Infirmary, Edinburgh.

Hundreds of lives have been lost through over-winding at collieries, but King's patent detaching-hook, exhibited by Mr. Stephen Humble, colliery engineer, Derby, seems to be thoroughly reliable and efficient for the prevention of such disasters. Over 2,500 of them are in use, and we are told that 370 lives are known to have been saved by them. Mr. Humble also exhibits models of patent safety cages, which remain suspended to wire guide-ropes in the shaft in case of the fracture of the winding-rope.

Of appliances to prevent accidents on railways there is a very good display, foremost among the numerous exhibitors in this section being the well-known firm of Saxby & Farmer, who show the union of the block and interlocking systems and electric slot signal, now in use on the Tunbridge Wells and Eastbourne line of the London, Brighton, and South Coast Railway. They also exhibit a full-sized set of facing-points, with patent facing-point lock,—"the duplex detector." It seems to be impossible for accidents to occur where these appliances are used. Mr. W. Parker Smith, M.Inst.C.E., shows his patent automatic screw-brake, and the Heberlein Self-Acting Railway Brake Company show the Heberlein automatic and continuous friction brake, which has been largely used on German and other foreign railways. Both these brakes should be examined by visitors interested in railway matters,—and who is not so interested in these days when everybody travels by railway? Tweedy & Co.'s railway signal interlocking apparatus, Sykes's block system (as used on the London, Chatham, and Dover Railway), Brockelbank's automatic railway coupling, Douglass's patent coupling, and several other appliances for saving the lives and limbs of railway passengers and officials are shown.

For the saving of life at sea there is a good display of appliances, foremost among the exhibitors being the Board of Trade and the Royal National Life Boat Institution. The Board of Trade exhibit their completely-equipped rocket-wagons, and show, by means of tackle rigged up for the purpose, how a line can be conveyed from the shore to a ship in distress, and how, when that has been done, the crew can be brought to shore in safety. The Life Boat Institution show one of their boats, thoroughly equipped and mounted on its carriage. Nearly 30,000 lives have been saved by the boats of this Institution, or by special exertions for which it has granted rewards. During last year, the boats of the Institution saved 966 lives, and granted rewards to the crews of fishing and other boats for saving 155 lives, making a total of 1,121 lives saved during the year 1881. These are facts which must commend the work of mercy which the Institution is carrying on to the support of the public. Messrs. Bullivant & Co., of Mark-lane, besides their patent flexible steel wire hawsers and cables, show their patent "sea-anchor," a very simple appliance for keeping long steamships whose machinery has become disabled head to wind. In view of possible contingencies in which our Navy will be concerned, Messrs. Bullivant's torpedo net will possess interest for many visitors. Messrs. Robert Boyle & Sons' method of ship ventilation (recently described by us), and their air-pump ventilators, are shown at their Stand. Messrs. John Gibbs & Son, of Liverpool, also show their patent system of ventilating passenger and cargo vessels, which appears to be simple and efficient.

The War Department exhibit the ambulances and other appliances used by the Army Hospital Corps, while other exhibitors of ambulances are the St. John's Ambulance Association and Mr. Burt, of Swinton-street, Gray's-inn-road, who exhibits Dr. Benjamin Howard's admirable ambulance-carriage for hospitals. Several of these carriages have been purchased by large employers of labour and machinery, so as to be available at a moment's notice in case of accidents to any of their "hands." We described the carriage when noticing the Sportsmen's Exhibition at the Agricultural Hall, a few months ago.

The necessity for the periodical inspection of steam boilers is the lesson enforced by the large collection of photographs, models, and tabulated statements exhibited by the Midland Steam Boiler Assurance Association.

Messrs. J. Berger Spence & Co. show the applicability of their excellent Belvedere concrete to the fireproof construction, not only of the floors of a theatre, but of such portions of the structure as box partitions, &c.; but the orthography of the descriptions on the placards attached to their exhibits should be looked to. Mr. A. D. Dawnay shows full-sized sections of fireproof flooring; and Messrs. Chubb & Son have on view a fireproof door for party-walls, consisting of a slab of Dennett's patent concrete in an iron frame. Mr. R. Adams, of Great Dover-street, shows his "Anti-Accident" reversible and sliding window, which we have described on previous occasions. The Silicate Paint Company are exhibitors of their innocuous paints.

Among the miscellaneous exhibits, which are very numerous, we may name Spong's fire-extinguisher, and Sir Thomas Dancer's patent saddle-bar, likely to be found of great service by riders in the hunting-field and elsewhere. Mr. Stanley Leigh's lock-bolt is a simple little contrivance, easily adaptable to all kinds of fire-arms, which with its use can be kept loaded without danger of accident when they are incautiously handled.

We have only been able to mention a few of the exhibits; but, from what we have said, it will be gathered that the exhibition is a very interesting one. But if it is to meet with the success which its character merits, a little more life must be infused into its management. As at present arranged, the exhibition will remain open until the end of the present month.

New Zealand International Exhibition, 1882.—In Class 72 (lithography and engraving) a gold medal has been awarded to Messrs. Unwin Brothers, of the Gresham Press, Ludgate-hill.

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A WARNING TO WORKMEN.*

"Sanitary science must be the outcome of a clearer knowledge, and its perfection can only be brought about by a judicious instruction of the people."—*Dr. Carpenter.*

HEALTH is your sole capital in life. On it depends your own future and that of your wife and children. It is the wall that shuts off the hospital and the poor-house; but it is very easily broken down by a little neglect and carelessness.

Have you ever thought how much sickness there is in the community? How many of your friends at the present moment are laid up with some ailment? What amount was paid out of the sick fund during the last year in your mutual benefit society? Who fill the hospitals and crowd the dispensaries in all our large cities? Who support the 90,000 regularly educated doctors, not to mention the legion of quacks who feed like leeches on the life-blood and purses of the poor? How do the drug-stores on every corner manage to subsist? Who pays the undertaker and the hackmen for the cheerless processions which daily cross every ferry to Greenwood and Cypress Hills? These are facts worth the consideration of every working-man,—not in a morbid or gloomy spirit, but in a candid and thoughtful one. Sickness is his greatest foe. It makes a man weak, miserable, and *poor*. It robs him of his hard-earned wages, and makes him pay out extra money for food, drugs, and doctors, while too often it brings men to the poor-house.

Every year many thousand persons die who might be still alive and well if they had only known how to keep in health; while for every death there are also twenty-eight cases of sickness. Professor Chandler estimates that 10,000 preventible deaths take place annually in New York, besides 280,000 preventible cases of sickness. What a vast waste of human lives and strength this represents!

If you have ever had a severe fit of sickness you know just what it costs, both in physical prostration and in dollars and cents. A severe attack of typhoid fever, for example, means *four months'* loss of time, besides the doctor's bill and cost of medicine. An ordinary "respectable" funeral, without display, will cost fifty dollars. We say nothing of the human anguish, pain, and misery entailed in a thousand homes every year by sickness and death, all of which might be prevented if due effort were made.

You are too sensible to charge upon Providence what is due to the folly of man. You are not an Oriental fatalist, who calmly sits still in the midst of danger, and says, "It is the will of Allah whether I shall die or live." It is your duty as an intelligent man to be wise in season, and to consider these subjects.

"But," you may ask, "how am I to know how to keep my health? I am not a doctor, and cannot be expected to understand these matters."

This is true, and we do not intend for a moment to urge you not to take the best medical advice when sickness befalls you; but often by taking a few precautions you can avoid the necessity for calling in a doctor.

Here are a few suggestions for the *prevention* of sickness. They include, first, attention, to your home surroundings; and, second, to your personal habits.

In regard to the first, one of the earliest physicians, Hippocrates, said that the essentials of health were pure air, pure water, and a pure soil. Your home should, above all things, be free from damp. It should not be built upon made land, or where it can be flooded by rains, or by a rise of tide. Dampness is a certain source of consumption, rheumatism, croup, diphtheria, and other diseases. The nearer your living-rooms are to the ground, the more danger there is of damp. It is better to occupy an attic where you can get the sun and the air than the basement.

Again, new houses are liable to be damp from the evaporation from the plaster and mortar, which contain a large amount of water. A Spanish proverb says of new houses, "The first year for your enemies, the second year for your friends, and the third you may live there yourself." This tells the whole story. Again, cellar air is unwholesome; and this is another reason why basement rooms are bad. It is very unwise to store vegetables in cellars, or anything that will cause impurity of the air.

So much for pure soil. Next for pure air. This is the most vital thing of all. One may live without proper food and drink, and on a damp soil with impunity, but foul air slays like a sword. Every person needs pure air to breathe. Each time we empty our lungs a certain amount of impure air is thrown off. Thousands die yearly for lack of pure air. It is free to all; it costs nothing. Open the window and it flows in abundance to the beggar as to the millionaire, bringing health and life to all,—if only people would not shut and bar it out in their blind, stupid ignorance. When a man gets consumption it means that he has not had enough pure air to feed his lungs. When typhus fever carries him off, it means poisoned by foul air. When his children faint and fall by the way, with scarlet fever and croup or diphtheria, it is foul air that does it.

What is it that makes most people sick? Eating too much and too fast; drinking too much; want of fresh air; want of sunlight; want of exercise; want of cleanliness. Few persons die of starvation,—many do of gluttony. But you will say, "If I get sick I can't help it,—it's only bad luck that brings fever and rheumatism." Not so, my friend. There's no luck in cutting your fingers if you fool with edge tools. More than half the sickness in the world is preventible, as any doctor will tell you. A sick man is a rascal, some one has said, because he has no business to get sick.

Make your children wash their hands and faces before going to school. When they are recovering from sickness, do not let them go back to school or play with other children until they are entirely well. Remember that your children will in time become valuable helps and bread winners: so take care of them while they are young, so that they may grow up strong and healthy.

Bathe as often as you can. Remember "Cleanliness is next to godliness," and a foul body means a foul mind. Keeping the pores of the skin open is a prime element of health. How carefully we groom our horses! and is not a man's health as precious as that of a horse?

Let your wife and children have as much out-door exercise as they can get. It will be a change and will not do the least harm. Take them to the park, or the battery, or Coney Island when you can, or at least across the ferry or down the bay.

Do not sit in damp clothes if you come home wet. If you feel chilled and cold, soak your feet in a pail of hot water, then go to bed and pile on the clothes till you sweat, and you will escape catching cold. In such cases hot tea or coffee, or soup is better than whisky to warm you. In cold countries tea is preferred to any drink. Liquor should never be taken by a sick person, unless by a doctor's orders.

Clothes should fit loosely, should be light, warm, and porous, should be adapted to the season as to colour, should be frequently changed, and should be scrupulously clean. The wearing of clothes until they are threadbare is an error.

In cooking, use the frying-pan as little as possible; greasy food is very unwholesome. Avoid pies, too much pork, and liquors.

Eat slowly, chewing the food well, and drink very little liquid of any kind while eating. Tea is not food, and too much of it is drunk by many persons, especially women and children. You cannot make bone and muscle upon "slops." Eat oatmeal and hominy in preference, and give children plenty of milk. Beans are very nutritious.

Do not shut every cranny and crack to keep out the air from the rooms, but let the windows stay open for a time.

Do not forbid the blessed sun from entering your windows. Do not stay in a house that has a bad smell in it.

Do not live in dark, gloomy, close rooms if you can get sunny, cheery ones. Is it not cheaper to give a little more rent to keep death and the doctor away from your door? Does it not pay to keep well? Think how much you have lost by a few weeks' sick spell. Would not the money have gone much further by avoiding sickness? "An ounce of prevention is worth a pound of cure."

Remove all garbage and refuse as soon as possible, especially bedroom slops. Have the walls and ceiling whitewashed or kalsomined once or twice every year.

Do not keep your rooms full of steam on wash-days, for that is a sure way to have your children down with colds or croup the day after. Open the window at the bottom, and place a board in the vacant space; then sufficient air can come in through the space between the upper and lower sashes without causing too great a draught. Keep the children out as much as possible on wash-days.

Do not souse water over the floors and stairs, even for the sake of cleanliness, as the woodwork becomes saturated with moisture, and continual damp breeds disease.

In looking for apartments, always strive to secure a well-ventilated bedroom. Air the room and bed-clothing every morning. Keep as few clothes, not in use, as possible in the bedroom, and do not sleep in any garment which is worn by day. Have no carpet on the floor, but a strip alongside the bed. Wipe off the entire floor once a week with a cloth dampened in water containing a little carbolic acid.

* One of the Sanitary Tracts issued by the Citizens' Sanitary Society of Brooklyn, U.S.

THE GLASGOW MUNICIPAL BUILDINGS COMPETITION.

THE REPORT OF THE ASSESSORS.

THE following report by Mr. Barry and Mr Carrick, the architect-assessors on the plans in the final competition for the new Glasgow Municipal Buildings, was submitted to the meeting of the Town Council held on Thursday last, the 6th inst.:—

"To the Lord Provost, Magistrates, and Town Council of the City of Glasgow.

Westminster, 26th June, 1882.

My Lord and Gentlemen,—In accordance with our report to you on the 7th of January last, the authors of the ten designs sent in to the preliminary competition, and selected by us therein, were communicated with (but through agents, so that their names are still unknown to us), and they were asked whether they would be prepared to submit matured designs in accordance with the conditions for final competition approved by you. They all signified their readiness to do so, and ten sets of designs were duly received on the 1st of June. Parliamentary work on behalf of the City of Glasgow rendered it necessary for Mr. Carrick to be in London during the month of June, but in order to be in a position to present our report to you with as little delay as possible we arranged to have the designs sent to London for us at once to examine them. We have accordingly done so, and as the result of a very careful examination, and having made an approximate estimate of the cost to carry out each of the designs, we are now prepared, in accordance with clause 1 of the final condition, informing competitors of our functions as assessors, to place the following four designs in order of merit:—1, Viola; 2, St. Ronan; 3, Semplice; 4, Gauntlet. We have not the slightest idea who is the author of the design and the set of drawings which exhibit it, sent under the motto of "Viola," which we have placed first in merit; but it is right to say that this design, in our opinion, shows great artistic excellence, while the working out of all the parts of the proposed building shown by the plan and sections are *primâ facie* evidence on the part of its author of great constructive ability, and an excellent understanding of the requirements of such a building as regards arrangement, light and air, good intercommunication, sanitary and ventilating arrangements, and a due regard for economy. We have every reason to believe that this design can be carried out in an effective manner to the extent described in the conditions within the sum of 250,000*l.* therein allotted for the work.—We have the honour to subscribe ourselves your obedient servants.

CHARLES BARRY.
JOHN CARRICK."

By the courtesy of the editor of the *Glasgow Herald*, we are enabled to state that the Town Council unanimously adopted the design bearing the motto "Viola," the author of which was found to be Mr. William Young, of London. It was remitted to a committee to make arrangements for carrying out the plans.

At a meeting of the Municipal Buildings Committee, held on June 29, "The Lord Provost submitted a letter, dated 15th inst., signed by Mr. Honeyman, president, and Mr. M'Lean, secretary, in name of, and by authority of, the Council of the Glasgow Institute of Architects, suggesting that the several competitors in the preliminary competition should be invited by the Municipal Buildings Committee to return their designs for exhibition, and that all the designs should be publicly exhibited after the final award had been made. After fully considering the letter, the committee were unanimously of opinion that it would not be expedient on the part of the Magistrates and Council to take any steps with a view to the exhibition suggested by the Council of the Institute."

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A CHAT ABOUT PEACH GROWING.

"How are your peaches this year?" "Oh! bad. You remember the storm on that Saturday, some weeks ago; well, it shrivelled them all up, and very few are left. I am so fond of peaches; it is most annoying." "Why don't you put them under glass?" "Look at the cost. I would, if it was not so dear." "What would it cost you?" "Oh! a lot of money. I am afraid to inquire; more than I can afford, I know." "I don't know so much about that. Let us go and see how J.'s are getting on."

J. is a queer fellow. Never does anything in the ordinary way. He has built a wall without bricks; a roof without a gutter; gearing to open lights without ironwork; trains his trees on wires no bigger than tea-twine, and grows them in boxes about the size of clothes-trunks.

We find a peach-house 100 ft. long, only 5 ft. 6 in. high in front, 7 ft. 6 in. high at the back, and 6 ft. wide. You can reach any part without a ladder or even steps. The house next the boiler is the early house, 40 ft. long, and has No. 4 4-in. pipes. The other house, 60 ft. long, is the late house, and has No. 2 4-in. pipes. In the ground 8 ft., centre to centre, are tanks of concrete slabs, 3 ft. long, 3 ft. wide, and 3 ft. deep. In the bottom of each tank is a hole, and under it, in a vertical position, a common 4-in. drain-pipe, with a brick over the top to keep the rubbish out. In the bottom of the tank is 6 in. of broken bricks, with turf grass downwards; so then all this dodging, you will see, is to keep the bottom sweet, and to prevent water-logging. The tank is filled with red turfy loam, and the trees supplied by Mr. Charles Turner, of Slough, who has always been J.'s friend and adviser under horticultural difficulties. So much for the trees; now for the house.

The sides of the tank stand about 6 in. above the ground, and on this J. has laid his sill, bevelled so that the water cannot lie on it; only, instead of being outside, as all well-regulated sills should be, to catch all the rain and rot quickly, it is inside, and the rain never touches it; the bars are outside the sill and run down to the ground or nearly so, and a slate stuck into the ground and bedded on the bar with putty, just as a square of glass would be, makes it all right. At the bottom the upright bars are 3½ in. by 1½ in., rebated and chamfered; the roof-bars are the same size, with struts at intervals to prevent raking. The back bars are the same section, the bars are simply mitred at the angles like a picture-frame. The eaves-plate and the head at back are inside out of the wet: by this arrangement, no gutters are required, and all the rain-water that falls on the roof runs down over the front glass into the border, so that the trees in front are watered by the rain as if no roof was there; the ventilators are sashes hung to loose rails, and are screwed on wherever required; a wooden rod and a wooden cog open a length of 60 ft. with great ease, and an oak fillet like the joint of a parallel ruler connects the rod with the ventilator, both for the front and the roof. All is glazed with putty. Jones does not believe that putty has been beaten, and his friend, Mr. C. Turner, quite agrees with him. "The house was built," says Jones, "in 1873." "Did you," we say, "employ a local man, or a regular horticultural builder?" "Oh!" says Jones, "I don't believe in local men for special matters like this." "Who was it, then?" we said. "Guess," said Jones. "Was it W.?" "No." "Was it O.?" "No." "Was it L.?" "If you guess again," said Jones, "you will guess wrong." "What did it cost you?" we asked. "Well," said Jones, "the cost of this was mixed up with some other matters, but the builder was here the other day and I told him I had been asked the cost, and I should like to know what one like it could be erected for. He said, 'the cost of tanks, slate, back wall, front, and roof, the two walls wired for trees, with ventilators in front and roof, 10 ft. apart; early house, 40 ft. long, with No. 4 4-inch pipes, late house, 60 ft. long, with No. 2 4-inch pipes, and saddle boiler, would be 235*l.*, and it is made up by taking the front roof, two ends, and a division, at 102*l.*, a wood lattice path at 13*l.*, wiring front and back at 10*l.*, heating with boiler pipes and valves at 50*l.*, stoke-hole at 12*l.*, and twenty-four tanks for trees at 18*l.*; the back wall of slate and bars costs 30*l.*, and if any of the above items were omitted, the cost would be reduced in proportion.'" "When was it built?" we asked. "Here comes my gardener," says Jones, "he will tell us all about it."

"The house," says Jones's gardener, "was put up in 1873, and the trees planted the same autumn. I picked a few in 1875; since then they have borne regularly about 1,200 peaches and nectarines in all every year. The early-house I started on the 1st of November; in January it was in flower; set in February, and the fruit, about 200, were ripe in the middle of June. (I send you a sample from this house, to show you what some of them are like.) The late-house I started January 18th. It was in flower in April (and a beautiful sight it was), fruit set in May, and they will be ripe about the middle of July, and generally last through August and into September. At present there are about 1,000 peaches and nectarines on the trees, which may be taken as the average."

"Well, but when you talk about starting in November, it must cost a lot for coke to keep up heat all through the winter? What do you suppose, now, the two houses, with their 1,200 peaches, cost you in firing for the whole year?"

"I have not," said Jones's gardener, "kept those houses separate; but I think if I say 5*l.* it will be about the mark.

"And how much time?" say we.

"About two hours a day for one man, taking all the year round," said Jones's gardener.

I fancy I see you jerking your head, and saying, "I would give something to see this peach-house."

How much will you give? Will you give two hours' time and 5s. 6d. in money? Because, if you will, it can be done for that, and in this way.

Take the train from either Victoria, Charing-cross, or London Bridge to East Croydon; then ask the cabman to drive you to Middleheath, Sydenham-road North: that is Jones's house. Go in at the garden gate (there are no dogs about), and ask for the gardener; take this paper with you; cross-examine the man as much as you like, and if you find I have over-stated anything, write and say so.

W. H. LASCELLES.

OBITUARY.

Mr. George Somers Clarke.—We hear with regret of the sudden death of Mr. George Somers Clarke (of Cockspur-street), which took place at his residence, Walpole, Chislehurst, at one a.m. on the 4th inst. He was with the Architectural Book Society on Saturday and Sunday, and returned on Monday, after a pleasant outing to Longleat, apparently perfectly well. We will endeavour in our next to give some particulars of his career.

Mr. Theophilus Smith, a well-known Sheffield sculptor, died on the 4th ultimo, aged forty-four. Mr. Smith was for many years a partner with his father, Mr. Edwin Smith, of the Monumental Works, Sheffield, but afterwards the connexion was dissolved, and he devoted his whole energies to art. As a youth, he was a successful student at the Sheffield School of Art. Mr. Young Mitchell was head-master then, and Mr. Godfrey Sykes (afterwards of South Kensington) the second master. Many well-known men were co-pupils with him at that time, amongst them Messrs. Innocent and Brown, the architects; Townroe and Gamble, of South Kensington; E. P. Turner, the painter on tiles; Harry Hems, the sculptor; Hugh Stannus, the Royal Academy's modelling master; Richard Lunn, the Crown Derby Porcelain Works designer; whilst the great Alfred Stevens, who created the Wellington memorial, was a constant visitor at the school, and an adviser of every young inquiring and aspiring mind therein. Mr. Smith published several works, principally upon monuments for the dead and artistic ironwork. His busts were always full of power. He had a large connexion amongst the wealthier class of merchants, who build princely residences outside the manufacturing towns of Yorkshire, and few of these stately halls there are which do not contain some samples of his skill. Endowed with great natural ability, Mr. Smith failed, perhaps, in business enterprise and application, and those who esteemed him most felt most that a very brilliant position might have been easily maintained had he used that determination to conquer weaknesses which seemed to intensify rather than otherwise as years went on. He died at Rotherham, and has left a large family to mourn his loss.

PATENT RECORD, SO FAR AS RELATES TO BUILDING.*

APPLICATIONS FOR LETTERS PATENT.

2,986. J. McDougall, Glasgow. Apparatus for regulating the supply of water to water-closets. June 23, 1882.

2,994. R. Jackson & S. Jackson, Broadbottom. Ash-receiver. June 24, 1882.

3,000. G. Dawson & C. Butcher, Thorncliffe. Kitchen ranges. June 24, 1882.

3,009. W. S. Morton, Edinburgh. Domestic fireplaces. June 26, 1882.

3,028. J. W. Cook, London. Temporary partitions in rooms, &c. June 27, 1882.

3,049. R. Searle, London. Manufacture of artificial stone. June 28, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named:—

June 27, 1882.

893. A. Jamieson, Blantyre. Apparatus for mixing concrete. Feb. 24, 1882.

934. J. Carpenter, Southampton. Apparatus for opening, &c., window-sash frames. Feb. 25, 1882.

980. T. Le Poidevin, Guernsey. Machinery for moulding bricks and tiles. Feb. 28, 1882.

2,614. C. E. Green, London. Domestic stoves or fireplaces. June 3, 1882.

June 30, 1882.

966. J. T. B. Bennett, Aston. Spring hinges, &c. Feb. 28, 1882.

2,549. T. Hyatt, London. Building construction, &c. May 30, 1882.

ABRIDGMENTS OF SPECIFICATIONS.

***Published during the Week ending July* 1, 1882.**

5,027. E. R. Hollands, London. Open stoves for fire-grates.

This is an improvement on Patent No. 4,448 of 1880 in making the front bars of the grate to lift with the rake, and allow the fresh fuel to be put in at the bottom of the fire. (*Pro. Pro.*) Nov. 16, 1881. Price 2d.

5,095. W. R. Lake, London. Machinery for the manufacture of bricks.

The press has two cams, one for giving the pressure and the other for ejecting the brick from the mould. Both are on the same shaft, and actuate the same plunger. The mould is provided with ducts, by which the surplus material is returned to the charging-chamber. A lifter is combined with the plunger to regulate the charge in the mould. (Com. by W. W. Potts, Bridgeport, U.S.A.) Nov. 22, 1881. Price 6d.

5,111. J. R. Hargreaves, Haslingden. Water fittings, &c.

To supply hot water over a house without circulating pipes, a cold-water pipe is connected with the boiler from a higher level than where the hot water is required. The cold water passing into the boiler will force the hot water out. Nov. 23, 1881. Price 6d.

5,118. H. J. Haddan, London. Roads and pavements.

These are made by mixing sand, hot tar, and pebbles. The ground is prepared with concrete, &c., and the tar and sand are poured over it. A layer of pebbles is then placed on the tar. (Com. by J. Salvat, Morceux, France.) Nov. 23, 1881. Price 2d.

5,162. F. Loüholdt, Frankfort. Ventilating buildings, &c.

Heating chambers are formed in the ventilation-shaft, in which are gas-burners to induce a current of air. Cowls are placed over the top of the shaft to prevent down-draught. Nov. 25, 1881. Price 6d.

5,190. G. Harper, London. Apparatus for securing knobs or handles to spindles.

A bayonet joint arrangement is provided between the knob, and an auxiliary adjusting piece or collar. This collar is first screwed on the spindle, and has two slots, in which corresponding projections on the knob are received, forming a bayonet joint. Nov. 28, 1881. Price 6d.

5,315. W. Clark, London. Securing window-glass.

India-rubber is used to hold the edges of the glass, which is secured to the frame. (Com. by T. Tanner, Osage, U.S.A.) Dec. 5, 1881. Price 6d.

Warley Mount Estate, Brentwood.—On Friday last, the ceremony of opening the new roads on this estate, which is situated within half an hour by express train from Liverpool-street, was performed by Mrs. Makins, assisted by Col. Makins, M.P., and others. The route was gaily decorated. There was a large gathering of the local clergy and other influential residents of the neighbourhood, and addresses were delivered. The first road was named Waldeck-avenue, by the kind permission of R. H. Collins, esq., secretary to H.R.H. the Duke of Albany. A dinner to the workmen on the estate, 130 in number, closed the proceedings.

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street, E.C.

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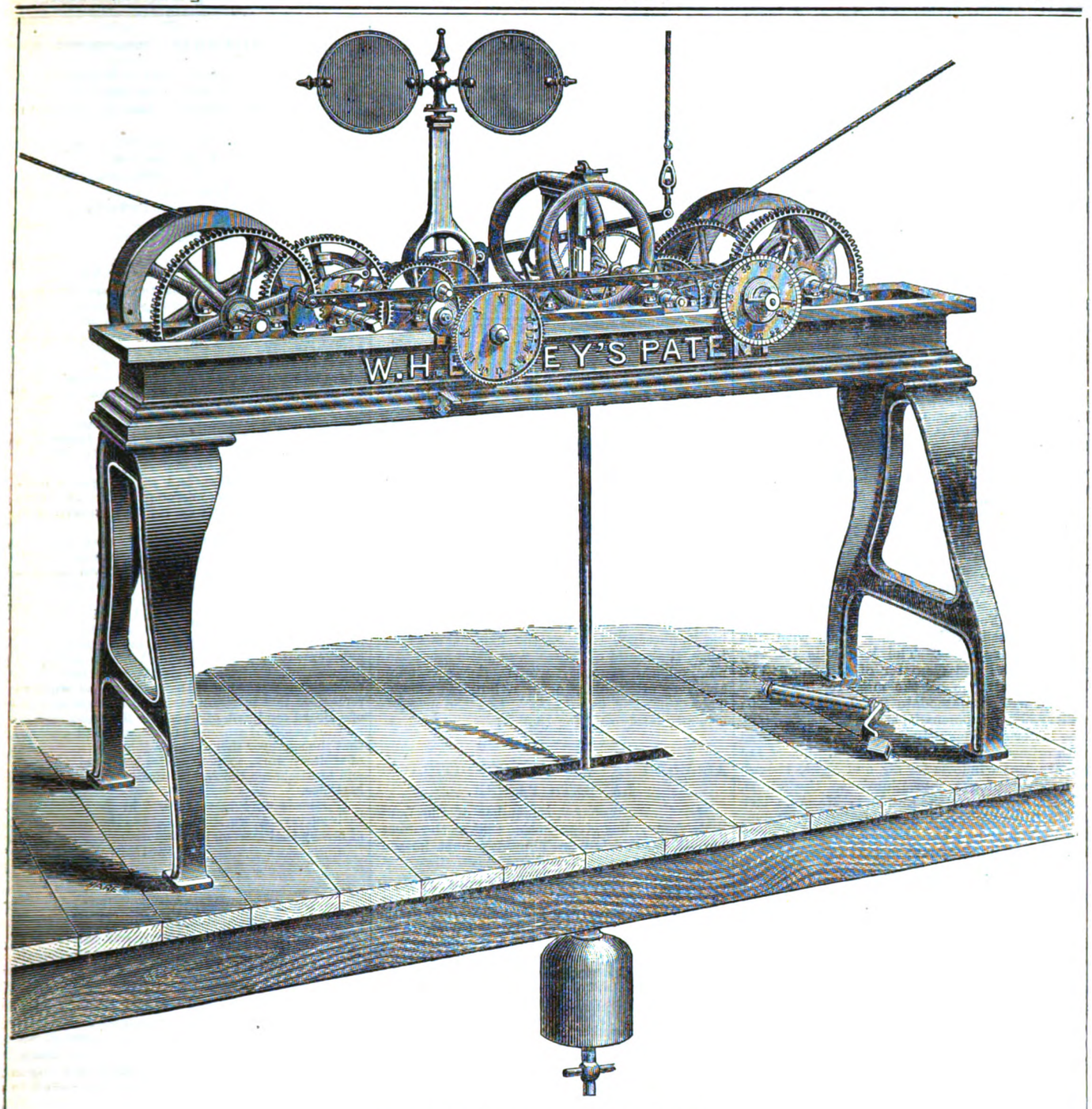

THE NEW PATENT TURRET CLOCK.

SOME ACCOUNT OF A TURRET CLOCK.

IN reviewing the manufactures of Messrs. W. H. Bailey & Co., of the Albion Works, Salford, Manchester, there is one department that takes our special attention, and which they term the "Turret Clock and Recorder Department."

We are informed that Messrs. Bailey are at present engaged in the manufacture of about twenty large turret-clocks, which are being sent to various parts of the world. Two, we understand, are for the Jesuit church, Spanish Town, Manilla, one of which indicates the time of day at nearly every chief city in the world; and the other will strike the hours and quarters on large bells, in the usual manner.

The clock we illustrate has been recently patented, and is now being fixed at a large iron-works at Bilboa, Spain, for Senor Don J. Martinez de la Rivas. It will be noticed that the construction of this clock is totally different to the hitherto modern turret-clock. The improvements partly consist of a new arrangement of the various parts, whereby the frame carrying the several shafts is made much narrower than in that which may now be considered as the old design of turret-clock. This arrangement is obtained by fixing the drums upon which are wound the weight-ropes on the ends of the shaft, outside the framing, which, it will be easy to understand, allows of much greater range in the angle at which the ropes may be adjusted, as well as giving greater facility for arrangement and attention, also for winding purposes. It will be noticed that there is also a novel arrangement of the fly or flyer governing the striking mechanism. This is accomplished by means of brass rings surrounding the thin discs, to which the discs are attached at suitable points, for adjustment. The clock strikes the hours, and will indicate the time on four 6 ft. dials. The gravity escapement invented by Sir E. Beckett is here designed in a manner which permits the parts to be very substantial and easy of access for oiling, for adjustment, and for examination. The clock is on strong legs, and is entirely self-contained, the whole showing evident care in the design, and is called unique as a specimen of horological engineering.

We have before us a fully-illustrated catalogue of "Recorders, tell-tales, nocturnographs, tide-gauges, and turret-clocks" which have been designed by this firm from time to time, and which are in use in mines, waterworks, manufactories, and public works both in this kingdom and abroad.

We notice, for example, that on page 18 of this catalogue there is a description of a patent automatic mine-ventilator recorder, an instrument which records automatically the variations in mine ventilation. This instrumant was designed by the makers, at the suggestion of Mr. Jos. Dickinson, F.G.S., H.M. Inspector of Mines, and is now successfully working at various coal-mines in the north of England and in South Wales.

We then find illustrated and described the large recorders used at the Sheffield Waterworks, which indicate the fluctuation of the water in the reservoirs. Similar in their object, we have, on page 14, a description of the Southport Waterworks deep-well recorder, and the electrical water-level indicator, fixed by Messrs. Bailey, for telegraphing to the Widnes Water-offices the fluctuations of the reservoir, some two miles and a half distant. Such recorders usually require to be designed for their special purposes.

The Lord Chancellor has added the name of Mr. Nicholas Joyce, A.R.I.B.A., of Stafford, to the Commission of the Peace for that borough.

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ARCHITECTURE AT UNIVERSITY COLLEGE.

RESULTS of Examination of Work done in Class of Architecture at University College, London, June, 1882 :—

MODERN PRACTICE.

Prize.—A. W. Glasson.
Second Prize.—H. W. R. Martin.
Second-class Certificate.—T. Andrews.
Third-class Certificate.—W. H. A. Barry, C. M. Shiner, J. E. Searl, P. Condy, G. P. K. Young.

ART.

Medal.—W. C. Jones.
Prize.—H. W. R. Martin.
Second-class Certificate.—R. W. Hamilton.
Third-class Certificate.—W. J. King, L. Conder, P. Condy, F. P. Oakley.

CONSTRUCTION.

Medal.—C. M. Shiner.
Second Prize.—G. R. K. Young.
Third Prize.—W. C. Jones.
Fourth Certificate.—H. C. Simmons.
Certificates, 1st Class, with Marks entitled to Prize.—P. Condy, W. J. King, J. E. Evans.
Certificate, 2nd Class.—H. Woodroffe, H. W. K. Martin.
Certificates, 3rd Class.—H. W. Moxon, B. V. Westbrook, W. J. Gibbon, R. M. Hamilton, W. J. Gargery.

THE NEW HIPPODROME AT YORK.

THE new permanent circus erected for Mr. Henry Swann, of Leeds, within the Fulford-road, near the Cattle Market, in the ancient city of York, was opened on the 3rd inst. by Mr. Robert Fossett's equestrian company. It is constructed of brick and wood, with iron pillars and supports. The length is 100 ft.; width, 62 ft.; and diameter of the ring, 42 ft. It has an entrance off the main road, and the interior will accommodate 2,000, viz., pit, 300; gallery, 900; promenade, stalls, boxes, &c., 800. The latter are elegantly cushioned, and covered with crimson velvet, and carpeted. There are twenty-four windows for air and light, though a number of gas jets illuminate the circle. Messrs. Spence are the builders; Messrs. Clark & Wood supply the joiners' work; Mr. Baines the carpentering; and Messrs. J. H. Bean & Co. the ironmongery and cast-iron columns.

BRIGHTON.

AT the Brighton Town Council, on Wednesday afternoon, it was decided that the report of Sir Joseph Bazalgette, C.B., C.E., respecting the making of vertical ventilating shafts should be carried out to the full extent of the Corporation's jurisdiction, and that the Borough Surveyor should expeditiously execute the work and obtain sites as well as the consent of the owners of property for that purpose. The Corporation of Brighton have been encouraged in their proposed prosecution of certain newspapers. The guarantee fund has since St. Peter's Day reached over 6,000*l.*, and still increases, so anxious seem the inhabitants to refute the allegations made as to the sanitary condition of the town. We are much disposed to think they had better leave it alone.

LARGE SALES OF LAND AND BUILDINGS AT EALING AND HENDON.

ON Friday in last week Messrs. Baker & Sons submitted for sale, at the Auction Mart, several lots of land and buildings at Ealing and Hendon. The property first offered consisted of the freehold land known as the Ealing Park Estate, which was divided into ten lots. The auctioneer, in introducing the property, stated that the estate was now most eligibly situated for building upon, and had been laid out accordingly. He added that an increased value had been given to it as a building site by the new railway station immediately adjoining it, in connexion with the Metropolitan and Hounslow Railway, now approaching completion, and which would shortly be opened for traffic. The first lot submitted comprised a plot of building land on the estate, containing an area of about eight acres. There was a very spirited competition for the lot, which was sold for 4,000*l.*, being at the rate of 500*l.* an acre. Three other lots, containing an aggregate of about eighteen acres, realised 8,900*l.*; and another lot, containing nearly seven acres, was sold for 3,600*l.*, the aggregate proceeds of the five lots disposed of amounting to 16,500*l.* The remaining five lots were not sold. The next property, which was offered in one lot, consisted of the freehold estate known as the Collindale Farm, at Hendon, comprising a farmhouse, homestead, and 136 acres of meadow-land. This property was described as being favourably situated close to several railway stations, and might profitably be converted into a building estate. The biddings commenced at 15,000*l.*, and it was eventually sold for 24,000*l.*, representing about 180*l.* an acre. This was followed by the freehold estate, known as Stoneyfield's Farm, at Mill-hill, Hendon, being submitted for sale. It consists of 110 acres of meadow land, with farmhouse and homestead. It was sold for 11,500*l.*, the three properties thus realising an aggregate sum of 52,000*l.*

VALUE OF PROPERTY IN DOCTORS' COMMONS.

LAST week Messrs. Winstanley & Horwood offered for sale, at the Auction Mart, the freehold property in Carter-lane and Addle-hill, Doctors' Commons, comprising, in Carter-lane, a block of buildings, consisting of warehouses, offices, and other business premises, together with the Swan-with-two-Necks tavern adjoining, and also the premises in Addle-hill, from Nos. 24 to 27 inclusive, the whole occupying an area of 9,200 ft. It was stated that the property was let on lease for an unexpired term of eight years, at a rental of 475*l.* per annum. The property is situated immediately opposite the St. Paul's Cathedral School and residence for the choir boys, and the auctioneer, in offering it, observed that on the expiration of the lease, the rental of which was little more than nominal, the property would offer a valuable and very profitable site for a building scheme. The first offer was 12,000*l.*, and the property was ultimately sold for 18,375*l.*

ALLEGED INSANITARY CONDITION OF LAMBETH PARISH.

Mr. C. W. ANDREW, a member of the Lambeth Vestry, has given notice that at the meeting of the Vestry on Thursday next he will move,—

"That, in consequence of the frequent reports of our medical officer and the inspector of nuisances, we, the Vestry of Lambeth, desire to draw the attention of the Metropolitan Board of Works to the unsanitary condition of the great majority of habitable buildings owing to the amount of sewer gas conducted thereunto, and to suggest that this unsatisfactory state of things may be remedied by the compulsory adoption of the principle of inserting an intercepting syphon conjointly with the construction of an air-chamber in the house-drain (at a point between the inlet to the main sewer, and before entering or passing under any building), and the continuation of all soil-pipes to the highest point of the roof, such soil-pipes to be left open at the top for thorough ventilation from the air-chamber, or any other means the Board may devise to prevent the admission of sewer-gas."

Mr. Andrew is, if we mistake not, a builder, and the presumption is that he knows what he is talking about when he speaks of "the unsanitary condition of the great majority of habitable buildings" in this large parish, which includes, besides Lambeth, Vauxhall, and Stockwell, the whole of Brixton, and a great part of Norwood. On this presumption he will do well to bring the matter forward.

"A LABOUR EXCHANGE."

SIR,—In an article which appears in your issue of last week you refer to a statement of M. Molinari in the *Débats* to the effect that the *Labour News* confines itself to the American labour market, and is simply a well-organised medium for the advertisements of Transatlantic steam owners. You will perhaps allow me to state that this is a complete mistake, the *Labour News* having no special American bearing and no connexion whatever with any American steamship agencies. In common with other lines available for emigrants, some of the Transatlantic companies advertise in its columns, but it simply endeavours, within its present narrow limits of space, to give from week to week "work and wages all the world over." The mistake is no doubt M. Molinari's, but having been referred to without correction by the writer of your article, you will, I hope, allow it to be removed by this explanation.

ALSAGER HAY HILL, Editor, *Labour News*.

NEWPORT TOWNHALL COMPETITION.

SIR,—As information likely to be interesting to your readers, I may now state that this Corporation has awarded the premiums as follow :—

1st., 70*l.*, to E. A. Lansdowne, architect, Newport: motto, "Work and Win."

2nd., 30*l.*, to T. M. Lockwood, architect, Chester: motto, "Caerleon."

CONYERS KIRBY, Town Surveyor.

APPOINTMENT OF LOCAL SURVEYORS

SIR,—As one of the far too many erroneous selections made in the above appointments, I feel it my duty to bring to your notice that of the Borough Surveyor to Crewe, made last week. Out of 139 applicants, five were selected, consisting of one surveyor, three chief assistant surveyors, none of whom had had less than six years' experience of local board or corporation work, in addition to other professional training; the fifth man,—or, rather, the first, as the Corporation of Crewe placed him,—was no less than a draughtsman in the Locomotive Department of the London and North-Western Railway Company's Works at Crewe. In this gentleman's application, and the one vague testimonial given specially to accompany the same, little mention is made of his having had experience in sanitary work.

I ask you, sir, or any of your readers, if it was ever intended that such important posts as borough surveyorships should be entrusted to the hands of men who are not conversant with the daily callings of such an office,—men who have not worked under the Public Health Act, nor laid a mile of main sewer in their lives? When we consider that the lives and property in a district are influenced to a great extent by the management of the surveyor's department, controlling, as it does, the many sanitary arrangements of the district; and when we remember that in many cases not a single member of a Board can boast of knowing the most elementary principles of sanitary science, it is most essential that the surveyor should have a thorough knowledge of sanitary work, so as to advise his Board thereon, and to discharge the various duties appertaining to his office.

If Boards were more careful in the selection of their surveyors, we should not see the wilful waste of money that goes on in many districts.

A SANITARY ENGINEER.

Books.

The Constitution-hill Archway and the Duke of Wellington's Statue. Harrison, 59, Pall-mall. 1882.

THE pamphlet under this title consists, oddly enough, of reprints from our own pages, 1845-7, and 1881-2, showing how opposed to the tastes and wishes of all whose opinion was worth having is the position of the statue of the Duke on Mr. Burton's arch, the object of it being to invite all who are interested in architectural and artistic proprieties cordially and firmly to say, "No." Our anxious desire is that the arch may be left where it is, and that the statue may be taken down and placed on a fitting pedestal in a proper place.

VARIORUM.

THE *third* volume of the new edition, revised and greatly augmented, of the "Imperial Dictionary of the English Language," has been published. Originally produced by John Ogilvy, LL.D., the new edition is revised and augmented by Charles Annandale, M.A. It is illustrated by above 3,000 engravings printed in the text. The scientific and technological features of the Dictionary are closely allied with its encyclopedic character. While it does not profess to contain all the terms of every art and science,—nor will these ever be found all collected in any dictionary,—yet it contains far more than the reader is likely to meet with in general literature. It will be found especially full in the departments of zoology, botany, geology, anatomy, medicine and surgery, mathematics, physics, chemistry, mineralogy, astronomy, archæology, architecture, engineering, machinery, manufactures, agriculture, and commerce. To secure accuracy in the definition of scientific terms, and correctness generally in the treatment of scientific subjects, the articles belonging to the various sciences have been carefully revised by men eminent for their scientific attainments. The book is published by Blackie & Son, of the Old Bailey.——From "Cities of the World," for July, we get notes of a walk

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through Rotterdam. The whole of the city is intersected by canals, broad, long, and deep, and capable of accommodating vessels of heavy tonnage. These canals divide the city into so many islands, united by drawbridges, swivel-bridges, turning-bridges and a few stone bridges. It is curious to walk through Rotterdam and find everywhere these canals, with streets on either side, and trees along the side of almost every street, and, more curious still, to find that you can never get away from the shipping. In the very heart of the city large ships are discharging their cargoes; the masts of ships are seen among the houses, above the trees, beside the churches, and all along the centre of the main thoroughfares. Many of these ships are built expressly for the Rhine and Holland. They are single-masted, broad, stout, and all highly coloured and ornamented. The prevailing style is bright-green for the hull, with red or white stripes, gilded poops, varnished or highly-polished decks and masts, while buckets, hatchets, barrels, and other things are usually painted a bright red, with white or green stripes. The cabins are models of cleanliness and comfort, with brightly-polished windows, snow-white muslin curtains, and pots of flowers. Besides the novelty of finding "a fleet imprisoned in the heart of a city," there are many things to attract attention in the streets of Rotterdam. The houses have pointed façades, are of all shades of brick, from the darkest red to the pinkest pink; whitewashed stone or wood ornaments the façade; the windows and doors are bordered with broad white stripes, the window-cills are generally full of flowers. The windows are provided with little mirrors, by means of which the inmates can see all that takes place up or down the street without being themselves seen. Brass plates and brass knobs, in a high state of polish, adorn the doors, by the side of which bird-cages frequently hang. It is a curious fact that nearly all the houses are a little out of the upright, and lean more or less, while sometimes in a street all the houses will lean slightly in one direction.—— From "Architecture," in Cassell's "Popular Educator" for July, we transplant a few lines on the Interior of Ancient Houses:—"The information conveyed to us in the works of Vitruvius has received singular illstration and confirmation within a period less than a century, from the excavations at Pompeii, Herculaneum, and Stabia, cities which were overwhelmed by a tremendous eruption of Vesuvius in A.D. 79, and which contained houses built and inhabited by the Romans belonging to the age of Vitruvius. These excavations exhibit curiously-paved streets, having the tracks of carriage-wheels marked on them, and houses built of brick and rubble-work put together with mortar, all the materials being of very inferior quality, except the interior coating of plaster, to which they appear to have been chiefly indebted for their durability. This plaster was composed of lime and pounded marble, a substitute for stucco, and by its use a perfectly smooth and polished surface was obtained, nearly as hard as marble. With this kind of stucco the smallest apartments at Pompeii are found to be lined; and this lining is painted with various and brilliant colours, and embellished with subjects either in the centre, or at equal distances like panels. Painted imitations of variegated marbles, forming, perhaps, a species of scagliola, also decorate the walls of their houses. Few blocks of real marble are found, except in monuments and public buildings; though, in imitation of the wealthy Romans, the Pompeians inserted pieces or slabs of this material in their walls, and employed art to give them higher tints than those they possessed by nature. They also discovered a method of veining slabs with gold; and leaves of this metal covering the beams, walls, and even roofs of the houses, were introduced in great profusion. They covered their floors with cement, in which small pieces of marble or coloured stones were regularly embedded in geometrical forms; and in their best rooms they used mosaic (inlaid work) with ornamented margins and a device in the centre. The doors of their houses, being formed of wood, have been reduced to charcoal by the burning lava, and, of course, are found in an incomplete state; they turned on pivots, and were fastened by bolts which hung upon chains. Bedsteads are found, made both of wood and iron; but their beds were made generally of carpets and vests spread upon the ground. The articles of household furniture and convenience found in these remarkable ruins are utensils of every kind in silver, brass, stone, and earthenware, with vases of every size and adapted to every use; trumpets, bells, gridirons, colanders, saucepans (some lined with silver), kettles, ladles, moulds for jelly or pastry, urns for keeping water hot on the principle of the modern tea-urn, horn-lanterns, spits, and, in fact, every article of kitchen or other furniture used by us, except forks; chains, bolts, scourges, dice (some said to be loaded); a complete toilet, with combs, thimbles, rings, paint, pins, earrings, pearls, &c.——

Miscellanea.

Endorsing Cheques.—Before the Recorder, last week, Edward Clarke, an architect, Fairlawn, Beckenham, was indicted for forging a cheque for 46*l.* 14s. 8d. Mr. Horace Avory prosecuted; and Mr. Edward Clarke, Q.C., and Mr. Purcell defended. Upon the case being called on, Mr. Horace Avory said, with the permission of the Court, he did not propose to offer any evidence in this case. The relation of architect and client existed between the parties, and it was very probable that the defendant might have supposed that he had power to endorse the cheque. Mr. Edward Clarke having addressed the court, the Recorder assented to the withdrawal of the case. [We have commented before now on the habit, on the part of many persons, of endorsing cheques drawn in the name of other persons. The danger and impropriety of the practice is not sufficiently reflected on.]

Chancel Screen.—The new church at St. Peter's, Eldad, Plymouth, is to receive a beautiful addition in the shape of a handsome chancel screen. It has been designed by Mr. George H. Fellowes Prynne, F.R.I.B.A., of Adam-street, Adelphi, W.C., the architect of the recently-erected edifice, and son of the present vicar. The drawings show a high screen, stretching across from arcade to arcade, and dividing the chancel from the nave. Of an early character, the lower parts will be altogether of polished English alabaster, with quatrefoiled panels of inlay and mosaic. Above, all will be of wrought iron and brass. This grille work is being executed by Messrs. Ellis & Rice, of Gray's Inn-road, London, and is now in an advanced state. The alabaster screens themselves are being carried out by Mr. Harry Hems, of Exeter.

Yorkshire Art.—The stained glass contributions to the Bradford Exhibition by Messrs. Powell Bros., of Leeds, contained in two very large frames, are mainly a central apse window, subject, the Crucifixion; flanked by two windows about to be erected in Lympne Church, Kent, subjects respectively, St. Stephen before the Council and his Martyrdom; a large hall or staircase window, the subject illustrated being Archery; beneath which a central heraldic window, flanked by windows containing portrait medallions of the Prince and Princess of Wales, by whom the exhibition was opened, and two extern ecclesiastical windows, devoted one to St. Dominick, and the other to St. Catherine.

Rouen.—The decorations of the ceiling of the new Opera House and Theatre, in the ancient town of Rouen, have been executed by M. Louis Glaize, a prosperous young artist. The compartment over the stage represents the apotheosis of Corneille; the next, the car of Venus; and, in order, the figures of Terpsichore, Music, the Seine, and Oceana; also portraits of popular people appear.

Builders' Clerks' Benevolent Institution. At a general meeting, held at the offices, 27, Farringdon-street, on the 27th ult., Mrs. Sarah Ellen Kelly was elected a pensioner on the Relief Fund, and one of her children, viz., Ellen Kelly, was elected for admission to the Orphan Working School in place of Alice Grace Spencer, whose school term expired at Midsummer.

Messrs. Gardners' Loan Collection of Ancient Ironwork will remain on exhibition at 453, Strand, until the evening of Wednesday next, the 12th inst.

TENDERS

Accepted for the erection of new business premises, Tothill-street, Westminster, for Mr. R. Woodford:—
D. & R. Kennard, Lewisham £1,700 0 0

Accepted for residence at Marlborough-hill, Harrow, for Mr. W. T. Bonser. Mr. J. D. Mathews, architect:—
C. P. Mills, Stoke Newington £2,874 0 0

For the erection of the Hospital for Sick Children at Bristol. Mr. Robt. Curwen, architect, 103-4, Palace-chambers, Westminster. Quantities supplied by Mr. J. S. Alder:—

H. Lovatt, Wolverhampton	£13,341	0	0
R. J. Crocker, Bristol	12,862	0	0
J. E. Davis, Bristol	12,834	0	0
Wm. Church, Bristol	12,449	0	0
Wm. Veals, Bristol	11,994	0	0
E. C. Howell & Sons, Bristol	11,990	0	0
Lewis & Edbrook, Bristol	11,708	0	0
D. C. Jones & Co., Gloucester	11,700	0	0
Cowlin & Son, Bristol	11,388	0	0
Brock & Bruce, Bristol	11,350	0	0
E. & T. Hatherley, Bristol.....	11,200	0	0
Eastabrook & Sons, Bristol.....	11,100	0	0
Wilkins & Sons, Bristol (accepted)	10,900	0	0

For the erection of Wesleyan Chapel and Schools at Broadstairs, Kent. Mr. Robt. Curwen, architect, 103, Palace-chambers, Westminster:—

C. J. Hiller, Broadstairs	£3,062	0	0
W. W. Martin, Ramsgate.....	2,785	0	0
Paramor & Son, Margate	2,740	0	0
B. J. Cowell, Ramsgate.....	2,715	0	0
L. Shrubsole, Faversham	2,713	0	0
W. & T. Denne, Walmer (accepted)	2,575	0	0

For residence and studio, Eldon-road, South Kensington, for Major-General Beadle. Mr. William H. Collbran, architect, 94, Gloucester-road. Quantities by Messrs. Strudwick & Mennie:—

	General Building.	Oak Stairs.	Hot Water.
Colls & Son	£3,625	£152	£100
Martin, Wells, & Co. ...	3,574	137	97
McLachlan & Sons	3,540	200	97
Braid	3,160	117	65
Bywaters.....	3,145	150	155
Lucas & Sons.....	3,100	105	60
Ashby Bros.	3,039	137	81
Perry & Co.	3,000	173	84
Higgs & Hill (accepted)	2,917	120	80

For the new church of St. Saviour, Forest Gate, Essex. Mr. Edwin Clare, architect. Quantities supplied by Mr. W. Barnett:—

	Lower Story of Tower.	Tower and Spire.
Merritt & Ashby	£8,896	£11,193
Dove Bros.	8,675	10,555
Greenwood	8,324	10,539
Kirk & Parry	8,199	10,294
Manley	8,195	10,320
Brown	8,100	10,000
Bangs & Co.	8,050	10,180
Steer	7,990	10,636
Gregar	7,954	9,874
Jones & Co.	7,940	9,800
Morter	7,743	9,763

For proposed new residence, Crystal Palace Park-road, for Mr. M. McGeorge (exclusive of sanitary works and stabling). Mr. Edwin Clare, architect. Quantities supplied by Mr. W. Barnett:—

Vare Bros.....	£4,297	0	0
Brass.....	3,960	0	0
Lawrence.....	3,888	0	0
Manley.....	3,844	0	0
Steer.....	3,667	0	0
Kirk & Parry.....	3,651	0	0
Burrows	3,575	0	0

For alterations and additions to the Halfway House, Benham, near Newbury, for Messrs. T. E. Hawkins & E. B. Black-Hawkins. No quantities, and exclusive of old materials. Mr. James H. Money, architect:—

S. Elliott, Newbury	£534	0	0
E. James, Newbury	460	0	0
R. Harrison, Newbury	405	0	0
G. Elms, Newbury	348	0	0

For new music warehouse and premises, 47 & 48, Northbrook-street, Newbury, for Mr. Alphonse Cary, exclusive of the value of old materials of three houses on the site. No quantities. Mr. James H. Money, architect:—

R. Harrison, Newbury	£1,375	7	0
S. Elliott, Newbury.....	1,249	0	0
E. James, Newbury.....	1,242	0	0
Plumbers', Painters', and Glaziers' Work.			
R. Ravenor, Newbury	£182	0	0
Biddis & Son.....	180	0	0
S. Elliott.....	149	0	0
Geo. Boyer & Co.	148	0	0
E. James, Newbury	138	0	0

For the restoration of the parish church of Great Melton, Norfolk. Mr. J. B. Pearce, architect:—

Youngs	£2,298	0	0
Bailey	2,075	0	0
Rust & Son.....	2,050	0	0
Gunton	1,939	0	0
Hubbard	1,859	0	0
Dann.....	1,730	0	0
Lacey	1,590	0	0
Wilkin	1,570	0	0
Semmence	1,492	0	0

For rebuilding and altering ward flues at the Infirmary, Marloes-road, Kensington, for the Guardians of the Poor of Kensington. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C.:—

Mears	£3,525	0	0
Nightingale.....	992	0	0
Lavers	900	0	0
Crockett (accepted).....	815	0	0

For alterations and additions to the laundries at the Workhouse and Infirmary, Marloes-road, Kensington, for Guardians of the Poor of the Parish of Kensington. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C.:—

Mears	£6,445	0	0
Bradford	4,747	0	0
Rosser & Russell	4,542	0	0
Wells & Co.	4,495	0	0
Jeakes & Co.	4,355	0	0
Benham & Sons.....	3,990	0	0
May Bros., High Holborn (accepted)	3,900	0	0

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For the erection of children's ward at the infirmary, Gravesend. Messrs. Wadmore & Baker, architects:—

Seager, Gravesend	£2,376	0	0
Dering, Gravesend	1,871	0	0
Wood & Co., Peckham	1,719	0	0
Page, Gravesend	1,697	0	0
Wallis, Gravesend	1,557	10	0
Blake, Gravesend	1,550	0	0
Archer, Gravesend (accepted)	1,505	9	0
Sharman, Kingsland	1,500	0	0
Collins, Homerton	1,472	0	0

For the erection of new brick and stone bridge, with approach, &c., near Horsham, for the Justices of the Rape of Bramber, in the county of Sussex. Mr. Charles W. Whitaker, surveyor. Quantities supplied:—

Skinner, Horsham	£1,343	0	0
Lapish & Lutley, London	1,330	0	0
Wood & Co., Peckham	1,301	0	0
Buxton, London	1,194	0	0
Harrisson, Brighton	1,125	0	0
Hayward, Eastbourne	989	0	0
Bottoms, London	970	0	0
Bedford, Horsham	945	0	0
Trimm, Hersham	912	0	0
Chamberlain, Arundel	856	0	0
Hill & Co., Gosport (accepted)	835	0	0

For the erection of a dwelling-house for Mr. Cowan, St. John-street, Colchester. Mr. F. E. Morris, architect:—

Basket	£841	4	4
Shepherd	790	0	0
Lee	752	10	0
Put	733	0	0
Eade	720	0	0
Dean	695	0	0
Oldridge	678	0	0
Dupont (accepted)	639	0	0

For alterations to the British Oak, Old Dover-road, Blackheath, for Mr. T. Boxhall. Mr. W. H. Lewis, architect:—

Holloway	£425	0	0
Redman	375	0	0
Blow	355	0	0

For new premises at Matlock Bridge, for Mr. W. H. Hutchinson. Mr. John Nuttall, architect, Matlock. Quantities by Mr. F. S. Smith, St. Ann's-square, Manchester:—

W. Askew, Matlock	£1,900	0	0
W. Knowles, Matlock	1,900	0	0
A. Bridge, Matlock	1,870	0	0
Wm. Statham, Matlock (accepted)	1,860	0	0

For Sunday schools, Walthamstow, Mr. W. Howard Seth-Smith, architect. Quantities by Mr. Leaning:—

Crabb	£2,818	0	0
Lynde	2,730	0	0
Priestley & Gurney	2,700	0	0
W. & H. Castle	2,631	0	0
Goddard & Son	2,530	0	0
Ennor Julian & Co.	2,490	0	0
Gentry	2,360	0	0
Reid	2,335	0	0
Thompson	2,269	0	0
Good	2,176	0	0

For new shops and offices, No. 57, Basinghall-street, for Mr. S. Cook. Mr. Richard M. Roe, 140, Leadenhall-street, architect. Quantities by Messrs. Batstone Bros.:—

Kirk & Randall	£4,238	0	0
Colls & Sons	4,142	0	0
J. Mowlem & Co.	4,115	0	0
Ashby & Horner	4,057	0	0
T. L. Green	3,943	0	0
John Grover (accepted)	3,936	0	0

For alterations, &c., to the premises, No. 67, Cheapside. Messrs. John Hill & Co., architects. Quantities not supplied:—

Maplesden	£500	0	0
Swain	365	0	0
Collins	298	0	0

For new baths and lavatories at the Licensed Victuallers' Schools, Upper Kennington-lane. Mr. H. I. Newton, architect, 27, Great George-street:—

Chandler	£497	0	0
Wood	495	0	0
Stilings	483	0	0
Shurmur	468	0	0
Godden	466	0	0
Royal	431	0	0
Pickersgill Bros.	399	0	0
Walker	385	0	0
Cook (accepted)	373	0	0

For alterations to residence, Malling, for Mr. Henry Breton. Mr. E. W. Stephens, architect, Maidstone:—

Bishop, Birling	£1,225	0	0
Wallis, Maidstone	1,144	0	0
Simmonds, Maidstone	1,093	0	0
Allchin, Malling	1,085	0	0
Avard, Maidstone	1,084	0	0
Vaughan, Maidstone	1,070	0	0
Cox Bros., Maidstone (accepted)	1,025	0	0

For stables, Strood, Kent, for Messrs. Youngman & Co. Mr. E. W. Stephens, architect, Maidstone:—

Gates, Frindsbury	£440	0	0
Vaughan, Maidstone	410	0	0
Wallis, Maidstone	398	0	0
Navlar & Son, Rochester	360	0	0
Callund & Son, Rochester	348	0	0

For residences, near Rochester. Mr. E. W. Stephens, architect:—

Avard, Maidstone	£2,820	0	0
Cox, Maidstone	2,792	0	0
Hammond, Aylesford	2,772	0	0
Vaughan, Maidstone	2,694	0	0
Wallis, Maidstone	2,596	0	0
Naylar, Rochester (accepted)	2,566	0	0

For alterations to premises, Nos. 1 & 2, Magdala-terrace, Dulwich, for converting same into shops, for Messrs. Baxter & Co. Mr. J. M. Cable, architect:—

H. T. & H. Holloway (accepted)	£274	0	0

For the erection of four houses in the Hastings-road, Ealing. Mr. Robert Willey, 66, Ludgote-hill, architect:—

W. Stops, Ealing (accepted)	£800	0	0

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The Builder.

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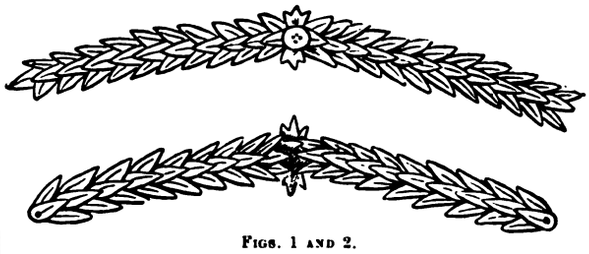
*Salaminia, or the Ancient Art of Cyprus.**

IN an article upon Cypriote Antiquities published recently in our columns, we pointed out the prominent part which had been played by Major A. P. di Cesnola, F.S.A., in the recovery of so many typical art-relics from the silent underground chambers of the dead in the numerous cemeteries of the province of Salaminia, or the north-easterly part of the island of Cyprus; and mention was made of the forthcoming literary work by the discoverer of these antiquities, to which it is proposed to direct the reader's attention on the present occasion, now that the book is completed. Elegantly produced, and adorned with upwards of 700 illustrations of the principal objects which fell to the fortune of Major di Cesnola to find from 1876 to 1879, there is little doubt that the volume, which is really an advanced contribution to the somewhat unclassed archæology of Cyprus,—the meeting-ground of so many artistic cults and influences,—will achieve a literary success. Its value, as an exposition of the hypogæal treasures lying yet undisturbed in the cemeteries of successive races, is considerably enhanced by the introduction from the pen of Dr. Birch, a veteran archæologist, under whose care at the British Museum a number of carved stone relics and other objects, found at Cyprus from time to time, have been placed. According to his own description, the author's way of digging in ruins appears to have been very simple, although he describes it as uncertain and expensive. He sank shafts a few feet apart at spots which bore indications of temples, palaces, or buildings, abandoning them when virgin earth or rock was reached, but tunnelling if encouraged by the appearance of the works. Digging and exploring in tombs in a different manner was arranged by dividing his men into small parties working separately, and visited when the entrance of each successive tomb was reached and made ready for opening under the eye of their employer. The uniform payment of 1s. a day, to which was added an extra payment, agreeably to a fixed rate, for the objects found, was made to each man, and, according to the price of wages in the East, this must have been a very high remuneration to the native excavators. Major di Cesnola employed among his workmen members of various creeds, and he freely accords to all those whom he employed a very high character for fidelity and trustworthiness. His desire to exhibit the collection on a large and comprehensive scale has not hitherto been successful; but it is not too late to hope that some day an opportunity may be found of at least a more extended inspection and appreciation than they have yet received.

Of the chapters devoted to the history of Salamis, and to the general idea of the antiquities, reference need not be made here, for some account was taken of these two branches of the work in the article already referred to. The golden antiquities recovered from the tombs were exceedingly numerous, principally of a sepulchral or mortuary character, formed in the most artistic way out of thin sheets or foil of precious metal hammered by the workman, who knew well how to make the most of his material, into shapes of much interest, such as fillets or chaplets for the head and brows of the dead (figs. 1, 2), pricked with indented spots and lines imitating the natural veining of leaves,



FIGS. 1 AND 2.

and resembling exactly the fillets carved in stone around the heads of many large and iconic statues; plates or leaves in the form of the human mouth and eye, piously laid upon the features of the departed friend just previously to the deposition of the body in the tomb, frontals or bands for the forehead, earrings, and even finger-rings of the flimsiest substance. Many of these objects, although manifestly intended for but the transient purpose of decorating the dead, are enriched with archaic ornamentation, such as simple foliage, mæanders, fret-work, and radiating lines. A similar practice was found at Warka, in Chaldæa, where golden veils with broad ribbons on each side of the head were found by Mr. Loftus, and at Monteroni in Northern Italy, where Mr. Dennis records the discovery of gold laminæ with archaic reliefs. The more durable and substantial articles of golden jewelry comprise necklaces of wire or drops, some of which betray by a close inspection of their details or pendants, the marvellously shameless effrontery of the fair wearers who could display about their necks and arms artistic models of the phallus and other cognate emblems, demonstrating beyond all doubt the depths of sensuality into which some, at least, of the races of Cyprus were sunk. Perhaps these emblems had come in time to be invested with a figurative signification remote from the obvious and primary meaning which one sees in them now. The earrings of solid make are of very various forms and styles; some of them are adorned with coloured glass beads or gems, and others have their catch or fastening looped into the elegantly-

FIG. 3.

FIG. 4.

FIG. 5.

FIG. 6.

chiselled head of an animal (figs. 3, 4, 5, 6.) The lion, goat, bull, cock, and dolphin appear to have been favourite subjects for this class of jewelry. One of the largest and finest of them is formed of solid gold wire twisted to form a body of some bulk, and terminating at one extremity in a female head furnished with ample tresses, and having a noble aspect of countenance. On the wire are strung four rings of massy gold, enriched with granulations in the so-called Etruscan mode, alternating with three beads of dark red and variegated colours (fig. 7). The finger-rings range over the whole period of Cypriote art; they exhibit many touching instances of feeling, for among them are frequently found rings of so small a calibre that they can only have been worn by the young children of the family. On some are tender words and inscriptions in an unknown script, pricked by loving hands as a souvenir of the giver to the wearer; others bear finely-engraved native or imported antique gems in deep intaglio, of Hittite, Phœnician, or Greek art; not a few derive an absorbing interest from the fact that they are formed of Egyptian or Phœnician scarabæi, pierced and set as bezels and signets revolving on a gold or silver wire, and bearing on their base the

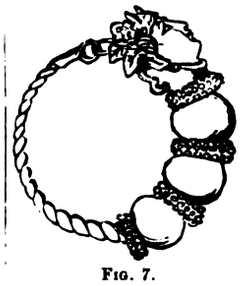


FIG. 7.

* Salaminia (Cyprus): the History, Treasures, and Antiquities of Salamis, in the Island of Cyprus. By Alex. Palma di Cesnola, F.S.A. With an introduction by Samuel Birch, esq., D.C.L., &c. London: Trübner & Co. 1882.

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mystical and often unintelligible characters of the hieroglyphics of the Nile. Figures of Venus,—a favourite deity of Cyprus, from which she derives one of her most constant epithets,—are not uncommonly found, formed of gold, probably pendants or amulets; and a peculiarly-twisted fibula, like two turns of a corkscrew, with chased ends, and enriched with inscriptions in the Cypriote character, is represented in this collection by several valuable examples.

Silver relics, from the easily-oxidised nature of the metal, are far rarer now than gold, which is practicably indestructible, but in their own day they must have been infinitely commoner and cheaper. Yet the collection shows silver fibulæ, snake bracelets, hair-pins, earrings, ear-picks, finger-rings, scoops, spoons, a model in the form of two human lips or a mouth, perhaps the bowl of a spoon, and several objects which must be referred to ornamental or decorative purposes. Bronze, on the other hand, being under certain atmospheric conditions of a very durable nature, contributes largely to the metallic series of Salaminian relics. Perhaps a thousand objects were altogether collected by the indefatigable exertions of Major di Cesnola. They consist of mirrors, vases, and other vessels for culinary or toilet purposes, strigils, pateræ, weapons of every kind, such as daggers and lance-heads, parts of armour for man or horse, pieces of tripods, candelabra; and, in a word, representatives of every ancient use to which bronze has been applied. One of the rarest bronze objects is a very ancient *serrula* (fig. 8), a spoon-saw,

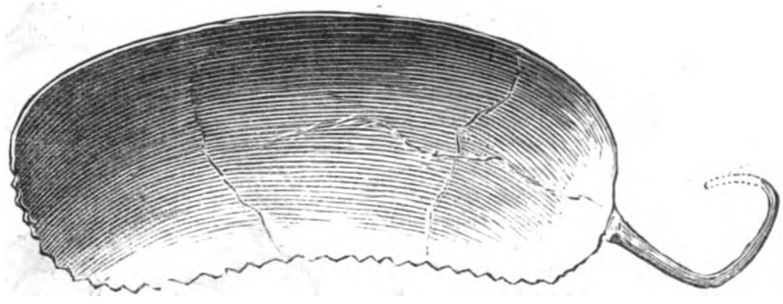

FIG. 8.

capable of containing about half a pint of liquid in its bowl, which is furnished with a tang now bent out of shape, to which an ornamental handle was affixed; one of the long sides of this fearful instrument is concave, and serrated along the edge with fine indentations or teeth. There can be no doubt that it was intended to be employed for cutting the throat or other parts of the animals that so frequently perished at the altars of the numerous deities venerated at Salamis, and, indeed, throughout the island. The spoonlike cavity caught the life-blood of the devoted victim at the very moment of its gushing from the body. This was found in a tomb at Kitium, on the east coast. Some of the bronze pateræ are ornamented with Egyptian religious or mystical subjects, and of one of these Dr. Birch has supplied the author with a lengthy exposition. A bronze *étui*, or needle-case, containing a needle still threaded with a piece of cotton, probably deposited by the hands of the mourner in the tomb of its owner, may be reckoned among the rarer and more striking objects formed of this metal. Iron, from its perishable nature, is not likely to be very copiously represented in good condition in any ancient collection, hence the swords with leaf-shaped blades and short cross-handles, buckles, and other objects which enter into the category of iron antiquities are here, as generally elsewhere, very far advanced in oxidisation and elementary disintegration. Enough remains, however, to show that a very extensive employment of this useful metal obtained among the ancient Cypriote inhabitants, whether they be Phœnician, Egyptian, Greek, or Roman.

Lead, also, is not a metal well adapted for long preservation; its condition, after the lapse of centuries, varies very much with the degree of humidity or of acidity possessed by the surroundings to which it has been exposed. It is well known, for example, that the acid air of London acts in a very deteriorating manner upon lead, and the same may be said of lead exposed to humid and saline earths in the subterranean chambers of a Cypriote necropolis. On the other hand, under favourable conditions of dryness of bed, or a still, neutral condition of air, leaden objects, 2,000 and 3,000 years old, have been exhumed at Cyprus, and many other sites, still exhibiting a pristine freshness of contour and a sharpness of outline of which actual inspection can alone convince the archæologist. Among the leaden objects which may be referred to as of peculiarly great rarity, are a stamped group of a gladiator or huntsman in combat with a lion, several bullets inscribed in relief with Greek inscriptions, toy-jugs and ornamental boxes, with simple floral or geometrical patterns upon them. Rarest of all, and of the greatest value as affording criteria upon which to suggest a date, are parts of a toy chariot stamped in lead, with the horse, pole, and wheels partially preserved; the wheels are oval or elliptical, not round, as we should expect, and the spokes have a very peculiar form, being composed of a diameter line along the major axis, with two short bars at right angles to it, trisecting this diameter. These spokes are identical with the arrangement of those upon a chariot-wheel painted on the celebrated Panathenaic amphora found by Mr. T. Burgon at Athens, and considered by Mr. C. T. Newton, of the British Museum, —where it is deposited,—to be, from the archaic lettering upon it, the oldest extant example of that particular style of vase. Its date may thus be referred to between 400 and 500 B.C. Leaden rolls, many of fairly good size, and inscribed with sentences in the Cypriote character, form a peculiarly valuable class of relics, from the fact that they add considerably to the extant series of Cypriote inscriptions, which is still somewhat meagre, few of any length or historical importance having been found as yet.

Ivory and bone objects appear to have been very extensively employed in Cyprus for ornamental, decorative, and domestic purposes,—seals, rings, bosses, studs, hairpins, spoons, dice, spatulæ, boxes, handles of knives, keys, and bridges of lyres and other musical instruments, frequently fall as spoil to the successful excavator: some carved in a coarse and clumsy manner, and thereby evidencing the decadence of the carver's art; others exquisitely carved during the best period of Greek art; and others, again, manifestly dating from an archaic age. An ivory box, carved with an Egyptian religious scene, enclosing a leaden box like a pill-box, and itself protected from injury by two bowls of terra cotta luted together at the rim, so as to form a modern case or envelope, was found in an outer tomb; and another tomb yielded an archaic figure carved out of bone, a kind of pin-box, about 10 in. in height (fig. 9), form of a draped female. This opens in the centre, and contained a few small pins of ivory or bone. The art here is very simple, and indicates the influence of Egyptian modes on the taste of a Greek artist, who has disposed the long and severe folds of the drapery with great care, and yet retained a natural position for the vestment. The eyelids, eyebrows, and some other parts of the figure show that the art of painting was called in to assist the carver, the colour having been applied to them with a brush. The hair is gathered up in a knot, and there are small wings on the head, which have led to the conjecture that the little figure may have been intended for a representation of Medusa. The arms were attached to the body by small plugs or pins. Altogether, it is a fine example of the art of the toy-carver 2,000 years ago. Shell remains exist in the form of toilet-boxes, and ornamental rings or pendants, cut from bivalves of convenient dimensions, several having Cypriote and Phœnician inscriptions upon them, which sufficiently attest the high antiquity to which they must be assigned. Of stone remains, the author has not acquired a very large collection, and this is, as he tells us in the preface, not because he did not find any, nor make researches for them, but he was unable to treat them like small objects which for their portability are more easily removed. There are, however, several slabs with Cypriote inscriptions engraved upon them, of the highest value to the philologist in the present state of research into the origin of this lost language. One slab in particular bears, three times repeated, a character or syllable hitherto unknown to the writers Schmidt, Deecke, and De Luynes, who have paid the greatest attention to the subject. Carved heads appear numerous, and divide themselves into the styles of the four great racial classes who successively ruled the island; but there are many in which is shown the blending of the art of one nation with that of another of approximate chronological position. For just as Græco-Roman art is so frequently illustrated by the antiquities of Italy, so Cypriote sculpture shows Assyrian, Phœnician, Egyptian, and even Hittite style, influencing, and in turn influenced by, one another.

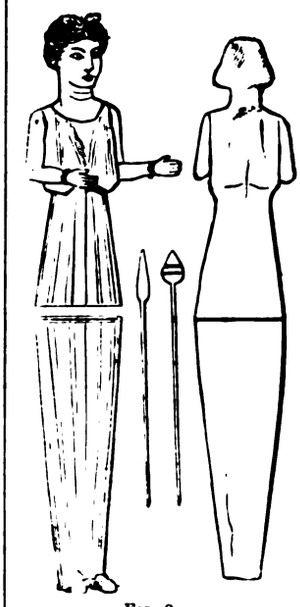

FIG. 9.

It is curious to find a trumpet formed of terra-cotta, about 3 ft. long, so compactly baked that, after the lapse of twenty-three centuries, it may be made to give no uncertain sound when in the hand of a dexterous musician, its voice vieing with the note produced by a metallic post-horn of the present day. It is curious, also, to observe the carved heads of music-players, having a mouth-strap passing round the head under the ears, to keep in position a double flute or pipe not unlike those which the Calabrian or Sicilian youth, even now, fashions with a pruning-knife out of the local reed, one being designed for the sharp notes, the other for the droning accompaniment. No doubt, rude music, often then, as now, was performed upon some of these "scrannel pipes of wretched straw"; but if "lean and flashy songs" sometimes grated on the ancient ear, the fine bronze pipe, which Major di Cesnola found, and which Mr. W. Chappell, F.S.A., the historian of ancient music, has rightly described here for him as the only one of its kind that has been found throughout the whole range of classical antiquities, could discourse music sweetly enough in the hands of its skilled owner, whom it accompanied to the silent, tuneless grave. Rings of bronze, sliding round the barrel, according to their position shut or opened notes so as to enable the performer to alter the scale at pleasure, a similar arrangement being noticeable upon the ivory flutes found at Pompeii. The gem of the stone objects is undoubtedly the little tripod basin, covered with Cypriote inscriptions radiating from the centre of the bowl, and having a single character engraved on the bottom surface of each of the feet. The carved sarcophagi, and the tomb-stones with Greek inscriptions, as well as the finely-carved tympanum of a Byzantine doorway, with several scenes from the life of Christ in high relief, are of great interest, and show the wide range of time which is represented by this portion of the collection. Of alabaster, serpentine, chalcedony, crystal, and other precious stones, the best pieces are described at length; and the chapters devoted to Assyrian and Babylonian cylinders, carved in jasper, hæmatite, and steatite or soap-stone,—a fertile subject, not altogether satisfactorily worked out as yet by archæologists,—Greek and Roman engraved gems, cones, scarabæi of Egyptian and Phœnician art, pieces for inlaying, and so forth, appear to contain material for the deepest study and reflection.

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The glass relics are, with the exception of the terra-cottas, by far the most numerous in the collection. Four thousand specimens, many among them being unique in shape, size, or ornamentation, are a very good number to have rescued from the dark chambers of ancient burial-places on the plains and on the hill-sides of the island. There can be no doubt that some of these beautifully-painted glass vases were made at Tyre by Phœnician craftsmen, who were for a long period of time in sole possession of the secret of producing and manipulating this then precious and expensive material. Of these, one in form of an amphora, with golden lining to the mouth, and painted with peacocks, foliage, and flocks of birds, has never been surpassed in any collection. But the hand-painted vessels are far outstripped, in point of beauty of colouring, by those which, originally transparent, have acquired, by long exposure to the effects of time, a brilliant colouring at Nature's hands; for she has enriched them with the ever-shifting, quick-glancing hues and gleams of iridescence, and in this respect no human agency has ever reached, or even approached, the secret of imitation. Of the early kind of glass, tolerably thick in fabric, of a pale or dark blue, with undulating or zigzag lines, white, yellow, blue, or other colours, many vessels for toilet or perhaps medical uses, resembling wine-vessels or water-jugs, were exported by the makers in Tyre and Sidon to Asia Minor, Cyprus, Greece, Etruria, and, in fact, whithersoever trading enterprise and commercial security were current. Their use appears to date from the fourth century B.C. The finest forms are the alabastron, of cigar-shaped body, with broad, flat lip; the amphora, diota, and hydria. None have much interior capacity for liquids. It is strange to see among the illustrations in the book the familiar modern egg-cup, with the shell of an egg still remaining in it, just as it was placed in the tomb, more than twenty centuries ago, as a last offering to the dead. The cup is of thin glass, streaked in colour, and made with double skin, turned over, like some of the cheap German glass ornamental vases which may be seen in our modern toy-shops. Curiously enough, the practice of depositing eggs as offerings in a tomb has been lately very powerfully illustrated by the discovery of a *cylix* or *cothon* (a two-handled cup), of black ware, at Cameiros, in Rhodes, containing the remains of a sepulchral offering of no less than five eggs and two astragali, or knuckle-bones. It is now in the British Museum. Painted glass, glass vessels with large oval or circular depressions, others with tears or drops studded all over their outward sides, and delicately thin bowls moulded with Greek inscriptions or classic ornaments abound. One (fig. 10) bears the heads of Gorgons, and the *pelta*, or shield, used by and conventionally attributed to the Amazons, combined with annulets and simple floral decorations. It is finely iridescent with a constant change of tints which is impossible to describe, varying as they do incessantly from gold and opal flashes to blue, green, yellow, and purple tints as the light is allowed to fall upon it. The models of heads in solid glass of various colours, taking the forms of tragic or comic characters, or derived from animals, must not be passed by altogether unnoticed. These little pendants, whether toys or ornaments for women's necklaces no one can say now, appear to be made much in the same manner as the glass-workers now-a-days use to construct their brittle toys and nick-nacks, but the deep blues, browns, and solid yellows of the ancient examples may be sought in vain in the colourless transparencies, or the black of the modern work.

FIG. 10.

Terra-cotta fictilia share the most important place in this collection of "Salaminian things" with the glass in point of numbers. The diversity of the objects, and the great range of time represented by them, are truly remarkable. Nevertheless, the number of those which are to be referred to the archaic period of uncoloured clay, or clay sparingly coloured with streaks, concentric circles and bands, is far greater than those which indicate a later age. In fact, more than nine-tenths of the whole of the fictile pottery found by Major di Cesnola, and described in his work, would be classified under the archaic age of not later than the fifth century B.C. Toy chariots (fig. 11), with wheels that will yet revolve, being as well set as when first made, horns or pipes, statuettes and heads of statuettes in various ethnical styles, and showing every kind of treatment, religious, processional, mythological, tragic, heroic, comic, domestic, and grotesque, such as goddesses, among whom Aphrodite and Eros are pre-eminent, priestesses, musicians, warriors, masks, animals, centaurs, and miscellaneous groups abound. Not a few of these are designed and executed in the purest and most artistic manner. Of one particular class, that of the musicians, the author records a curious and valuable series. Every one of them carries a lyre or small harp (fig. 12), but these instruments differ from each other in greater or lesser degrees. Among them are females whose physiognomy, stature, costume, and head-gear are undoubtedly Greek, with lofty coronets of elaborate patterns. Another class of harpists are clad in tunic and toga, chiton and peplos, but they wear no lofty coronets, their hair being bound with fillets, and in some cases the heads being covered with veils. Another class is remarkable for wearing robes resembling stoles over their togas. A bracelet, of considerable dimensions, is nearly always represented upon the right wrist of these figures. The finely-modelled clay groups are most varied in character,—fishermen, snake-charmers, plump children, and withered hideous hags, cringing beggars, swaggering dandies, pedlars, actors, pedagogues, gladiators, hermaphrodites, boys playing at games or going to school, the figures and attitudes which we are accustomed to attribute to Eros, Psyche, Hercules, Æsculapius, Telesphorus, Genius, Ulysses, Silenus, Somnus or Hypnos, Leda toying with her Swan, Nymphs and Muses, are richly represented in this branch of the collection, and the critical remarks which accompany the description of the objects indicate an extensive archæological knowledge on the part of the writer.

FIG. 11.

FIG. 12.

Earthen vessels also are, as may be readily imagined, very numerously represented, and as to variety, there is hardly a shape or size familiar to the students of ancient pottery which is absent from the collection; while, on the other hand, there are several examples which are unique, and the employment of which can with difficulty be determined. Many of the larger urns and vases have their archæological value greatly enhanced by the fact that they carry inscriptions, either scratched or painted, upon their surfaces, in Phœnician, Cypriote, and Greek characters; and from the lamps, which are, of course, of a later period, a large list of potters' names could be compiled. Of the archaic vases, the finer specimens indicate all the peculiarities which were pointed out not long since in our notice of the Vase Room in the British Museum. Two, however, of archaic red ware, Phœnician in feeling, are unique in exhibiting figures of men, birds, and trees, painted in black pigments upon them, in addition to their usual enrichments of concentric bands and disks or annulets. The tree on one of them (fig. 13) is of the sacred or *hom* kind,

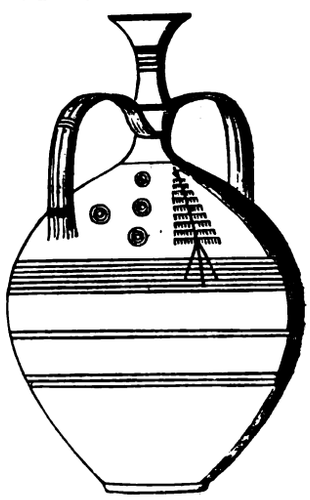

FIG. 13.

being the emblematic palm or date which is found to be of significant use over many Asiatic regions, and occurs on Assyrian relics, royal Chaldean breastplates, in Egypt, India, and even China. According to the author, a reminiscence of the *hom* is often seen to this day in the patterns of Turkey carpets, and the Greek *anthemion*, or honeysuckle ornament, has been referred to by some as a variety of this symbol divested of its significance, but retained as a merely ornamental device of harmonious lines. The other vase shows rude figures of men walking, carrying faggots of wood to a funeral pyre. These figures give extraordinary importance and value to the vase on which they appear, for among thousands of vessels that have been found in Cyprus of the same class, no other is known to bear the representation of a man, a bird, or a tree. Passing over the almost endless variety of terra-cotta relics of the island's own or of imported art,—all belonging to the earliest, or, at latest, to the first transitional period,—reference may be made to the *tetines* or sprinklers, in form of animals, which are very numerous, and believed by many writers to have taken the place of the infant's feeding-bottle, of modern times; others, however, believe they see in these objects lamp-feeders and perfume sprinklers. We may refer also to the many curious lantern-like objects with cylindrical bodies pierced with large holes and furnished with a doorway, which may be lamp-holders, or of use for keeping a small charcoal portable fire for warming the hands in winter. Allied to the tetines is a curious hydrostatic jug (fig. 14), having the usual orifice of the mouth closed, and finished off in form of a female's head with flowing plaits of hair. A tube is carried up from the

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base, the vase requiring to be inverted when it was to be filled. A small spout is placed

FIG. 14.

in the centre of the body, capable of dispensing a few drops of liquid perfume at will. The ornamentation, glaze, colour, and shape of this vessel clearly indicate a very high antiquity. The bizarre form of the *aryballi* and *unguentaria*, the numerous lamps, and the early gold, electrum, and silver coins of Azbaal, Baalmelek, Evelthon, and other kings, are described by the author in a manner which shows that he has deeply prosecuted his researches into the history of the things he has dug up with an incredible labour and fatigue. With this book, and those of one or two other writers on Cypriote antiquities, for a time, at least, we may be content to take it that the illustration of the ancient arts of Cyprus is exhausted, for it will be probably long before any very systematic or extensive excavations are prosecuted in that island, and, even when they are found, it by no means follows that relics will be so carefully classified or so judiciously illustrated by their finders, as the Lawrence-Cesnola collection has been by the fortunate discoverer of so much that is so instructive and entertaining to the comparative archæologist.

POLYCHROMATIC DECORATION IN THE MEDIÆVAL STYLE.

THE work on this subject produced by Messrs. W. & G. Audsley* is a good one of its class; but it seems to us to have come out rather behind its time. There is now no longer any question made either as to the fact of an at least extensive application of colour to the interiors of Mediæval buildings, or as to the propriety of carrying out the same method of decoration, when circumstances admit of it, in modern buildings of the same type; the work has, in fact, to a great extent been done, and not a few churches have been decorated (and occasionally over-decorated) with very much the same style of colour and detail as that shown in the illustrations to the present work. Indeed, it may be questioned whether the taste shown in these illustrations, though very good in itself and from the author's point of view, will not be regarded by others of the decorative designers of the day as somewhat *passé*, having been superseded by the newly-developed taste for neo-Greek forms. Had the book appeared at the time when the coloured decoration of Gothic churches was a prominent subject of interest and of controversy, it would have passed muster as a very good contribution to the literature of the subject. It is not the worse in itself for not having appeared sooner; but now it is rather like offering people a lesson in what they already know.

The tone of the authors, however, is more reasonable and less uncompromising than it probably would have been if the book had been published, say, twenty years ago. For, at that time, when the fight about colour was in progress, those who stood up for colour-decoration were colour-mad, and would have sacrificed every architectural detail, in the way of carved work or moulding, to the chromatic powers. Imaginary restorations of churches were made, which were described as "a mass of colour," a "blaze of colour," and in other such somewhat exaggerated language; and, unfortunately, actual schemes of coloured decoration were carried out, which were of the most violent nature, and nearly ruined the effect of some of the Mediæval buildings to which they were applied. And, even in better examples, we have questioned whether the painting of mouldings, for instance, with strongly-marked colours, is not a weakening of their architectural effect from interfering with the contrast and gradation of light and shadow. It is quite certain that both effects,—those of colour and modelling,—cannot be combined in their highest degree; one must give way to the other. If we wish to preserve the effect of light and shadow on a modelled surface, we must content ourselves either with faint tones of colouring (which, however, can never be really effective from a colourist's point of view), or we must confine the application of colour to the fillets and such other flat portions of the mouldings, leaving the rounds and hollows to make their own effect of light and shadow. This way of applying colour as a part of architectural decoration, by only partly covering the actual surface of the wall, leaving it to be seen as the ground on which the colour design is elaborated, seems the most satisfactory way of combining the beauties both of coloured and of modelled architectural detail, and was the method, as we know, practised to a considerable extent by the Greeks. Messrs. Audsley do not seem to wish at all to put colour above architectural detail; on the contrary, they observe that a system of coloured decoration should be subordinate to the architectural lines of the building. They also remark upon the necessity of a flat treatment, and the avoidance of any shading producing the appearance of relief; but such cautions are now mere truisms, accepted by every one who has any sort of claim to meddle with decorative painting. It is, however, not so superfluous to observe that when a building is to be decorated extensively with colour, it should be designed with that view from the first, and would in some respects require very different treatment of detail from that in the case of a building in which colour was not to be applied. It is, we fear, still correct to say, as the authors do, that "this fact is too often overlooked"; which is not only injurious to the completed effect of the building, but unfair to the colourist who is to be subsequently called in to decorate it, and who possibly finds the details of the architecture and the arrangements of lighting and wall space very much at variance with his wishes. The mouldings in such a case should be profiled from the first with an eye to their effect when treated in colour, and the wall spaces arranged with the same view, and on the basis of a distinct general idea as to what the final effect is to be.

The accounts given of the processes of oil and tempera painting on walls, and the practical difficulties to be guarded against, appear to be taken from reliable sources; the most important portions of them are quotations, accompanied by references to further sources of information. The remarks upon the preparing of designs and transferring them to the walls of the building will be practically useful to those who want information on the subject; they are, however, mostly what would present themselves to any one who brought practical common sense and knowledge of geometrical drawing to the work.

The coloured plates form by far the most important portion of the book, and the best-executed. The authors give, in the first instance, a scale of colours most desirable and useful for Gothic decorative work; these are toned colours, avoiding all the so-called primaries, and not presenting even any strong or pure secondaries. The authors do not seem to contemplate banishing the strong colours altogether, but observe that in work in the Gothic style they should be used only in very small quantities, to heighten some point in the design. This dictum, however, does not apply any more to Mediæval than to other styles of work. The employment of primaries in small quantities only and to heighten the effect of brilliancy without introducing a mass of powerful colour, is as much a characteristic of Saracenic and Arabic design as of Gothic, but the subordinate colours in those styles are more brilliant than the subordinate colours in Gothic decoration. In spite of what is in this book said about Mediæval colouring, the fact is that the Mediæval artists occasionally showed the most crude use of strong colours in great masses,—rather in later than in early work, some of which have been restored, with questionable wisdom, in our own time. They are, however, as a general rule harmonious, and so are the colours and tones selected by the authors for their chromolithographic illustrations.

The designs are intended to present samples of various types of coloured ornament of the Mediæval school; some of them are original, others are from examples from illuminated MSS. and other sources. The first three or four plates are wall diapers based on the brick pattern idea, showing the division of the walls into oblong parallelograms suggesting masonry, and each filled in with some ornament which can be repeatedly stencilled. Some of the filling-in ornaments are a little too sinuous and naturalistic in tendency for their position. A wall-diaper based on these very square and precise forms rather requires all its details treated with a certain squareness and angularity, to be in keeping with the idea suggested by its main divisions. Diapers of more elaborate character follow, geometrical ones based on the lozenge or trellis form, and flowing designs based on geometrical repetition, but in which the geometric base is rather evaded than expressed. Some of these, though recalling forms that are familiar to us in Gothic work, are sufficiently original and very effective and well designed. The band ornaments on Plate XVII. are exceedingly graceful; and it may be observed that, though appearing quite in their place in a book of Gothic design, they have, nevertheless, a very close resemblance to Greek forms. The treatment of conventional architecture in flat colouring shown on Plates XXIV. to XXVII. is ingenious and effective; especially the manner in which the Gothic capital and crocket are translated into forms suitable to flat colouring. We do not too much recommend this kind of quasi-architectural painting as decoration; but if it is done, the drawings here given show very effectively the right principle and practice to be followed in doing it. The specimens of Mediæval alphabets given in the closing plates, partly original and partly worked out by the authors from Mediæval types, are very good, and are practically useful for a draughtsman to have by him. The publication generally would have figured as an admirable one at the time of the Gothic revival. The question is, as we have already hinted, whether it is not out of date now, and whether the present change in taste is not disposing the rising generation of architects to the study of other types of ornament. There may, however, still be a sufficient number of the younger generation clinging to the Gothic creed, and to such Messrs. Audsley's book may be recommended as useful for reference, or, as we sometimes hear it more frankly put, "good to crib from." The style of ornament illustrated in it is unquestionably a better and purer style than much which is practised by the neo-Renaissance designers of to-day; but it must be admitted that its capabilities have been a good deal drawn upon, and the industrious authors of the book before us do not present any new departure. If they had, we should have attached more importance to the publication, and have considered it more at length. But it only represents what has been done before, sometimes as well, sometimes not so well.

* Polychromatic Decoration, as applied to Buildings in the Mediæval Styles. Thirty-six plates in colours and gold. By W. and G. Audsley, Fellows of the Royal Institute of British Architects. London: Henry Sotheran & Co. 1882.

COMPOSITIONS AND DRAWINGS OF VIOLLET-LE-DUC.

IT is satisfactory to see that the memory of so remarkable an architectural artist as Viollet-le-Duc is not without honour in his own country, in spite of his quarrels with and railleries against the official art-teaching of French schools. A collection of his drawings is being published under the sanction of a committee formed to secure proper credit and recognition for his labours, the first three numbers of which are now before us.* They are in process of publication in folio wrappers, in that curiously irregular method which seems natural to French publications, one of the wrappers containing the *première livraison*, the next containing the second

* Compositions et Dessins de Viollet-le-Duc, publiées sous le Patronage du Comité de l'Œuvre du Maître. Paris: Morel & Co. In course of publication.

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and third; both wrappers containing a heterogeneous mixture of subjects, the perspective view of a design in one number, the details in another, and so on. The whole, when issued, will at this rate be a kind of chaos of drawings of all sorts, which the purchaser or subscriber may then, of course, sort for himself. But it certainly is odd that people who are such slaves to logical method in essays and reviews and such productions should show such a contempt for method in their way of publishing art illustrations.

However, we must take things as we find them, and pick what we can out of the miscellaneous collection of Viollet-le-Duc's drawings vouchsafed to us; though there is no opportunity in the drawings we have so far for criticising or classifying Viollet-le-Duc's methods of working or the qualities of his design, which latter seem to vary very much. There has been a scepticism among a good many English architects as to whether the eminent Frenchman's designs were equal to his criticisms and theories and to his drawing. There is some little ground afforded for this scepticism in the contents of the portfolios before us. We see in all the specimens (the larger proportion of which are facsimiles) splendid drawing, the display of a power in using the pencil and brush which seemed to have been in itself, as it well might be, a source of pride and enjoyment to its possessor; and a remarkable readiness, freedom, and flow of ideas in regard to design: nothing done is commonplace, all the drawings show fertile invention and a certain power of style which cannot be denied or depreciated. But there is also discernible a want of refinement in details, and at times a failure to realise the essential features and feeling of the style adopted; for, in spite of Viollet-le-Duc's strictures, in various parts of his writings, against archæological architectnre, it cannot be denied that the greater part of his own designs are archæological in their nature, and in many cases such departures from the precedent of Gothic style as he makes are hardly in the direction of improvements. In fact, the effect of his designs on paper is owing in some degree to the remarkable power and freedom of drawing which they display, and we should be prepared to find that some of them would hardly look so successful in execution as in representation. The first one we open on is a design for a gilt bronze lectern, drawn with the greatest spirit in a difficult perspective position. On a large spreading hemispherical boss below the stem of the lectern are worked the signs of the four evangelists in relief, each in the centre of a quatrefoil, and around the lower rim of this project heads, which we may presume to be those of the apostles. This is carried on a tripod forming the base of the whole, which tripod is not a very fortunate detail, and as a foot or supporter looks decidedly weak. The upper portion, already described, is both spirited and suitable. The stone carved balustrade of the chapel at Pierrefonds is a piece of pure Mediævalism, interesting not so much for the design, as because it is a facsimile of a working drawing. In the production of working sketches Viollet-le-Duc was wonderful. He used the brush largely, in some cases entirely, drawing the object straight off with it without any pencilling, shading it rapidly so as to convey the full idea as to how the object should look, and leaving the lights as he proceeded so as to produce the most charmingly free and effective representation. A figure of St. Michael, forming the apex of the spire of the château, is another capital specimen of a sketch for sculpture; this is for *repoussé* work in lead, and shows what a capacity Viollet-le-Duc had for sketching the figure, giving to the whole balance and pose an appropriate action, though the detail may be open to question; in this case, for instance, the hands of the figure are certainly too small. An engraving of his design for the choir-gates at Notre Dame, wrought-iron work, is very free in the flowing scrolls of the main design, which, though conventional in detail, twine about with almost the freedom of natural vegetation; but the springing of all the foliage from a kind of bunch or sheaf of stems in the lower angles of the gates is certainly awkward, and looks like a makeshift. This and other points we come across suggest the idea that the author of these designs did too much, and worked sometimes too fast, and without giving himself time to refine his details. The first number closes with the design for the west front of the Cathedral of Clermont-Ferrand. This is a very aspiring design in the thirteenth-century Gothic style, with two lofty towers, and very tall slated or leaden spires on them, and an immense rose-window as the principal feature in the centre portion; but, considering this as the work of the leading French architect of his day, it certainly indicates that the spirit of Mediæval architecture has not been caught and reproduced in France as it has been by some of our own leading architects. From the point of view of English criticism, this would be considered a thin and wiry piece of Gothic, very deficient in breadth and power and in the true spirit of Gothic; the main entrance especially is very feebly treated,—the more remarkable in a country where there are so many grand Mediæval portal designs.

The second portfolio contains several more metal designs, shown chiefly in facsimiles of working drawings. One of these, a detail drawing for parts of a bronze font in Notre Dame, is a capital specimen of Viollet-le-Duc's Indian ink brush studies of detail, remarkably free in execution, and very effective in design, though in this, and others in which natural forms are introduced, the author was somewhat too naturalistic, and at all events too indifferent to truth of curve in his artificial branches and foliage. He draws one portion with considerable purity of conventional curve, and then he lets an odd stem butt out at no curve at all, but as if it were a natural sprout. This would have horrified such a designer as Owen Jones, for example; and not without reason. If there is one thing primarily necessary in ornamental design it is that the leading lines and curves in it should be harmonious and thoughtfully considered from the beginning; and this, Viollet-le-Duc, in his desire for freedom, seems sometimes to have quite overlooked. In the details of an ambon at Notre Dame, there is a charming bit of brush detail for wood carving, in which freedom is combined with true line and excellent conventional treatment of foliage. The grille before the choir, in the Cathedral of Clermont-Ferrand, is an example of very pretty wrought-iron design in perfect taste, and entirely free from naturalism; so also is that from the Church of St. Denis, which is much bolder in style, and ought to be an exceedingly effective piece of work.

The perspective view of a "projet" for an Academy of Music is so far nearly the only piece of Classic work in the selections, and the only Classic design on at all a large scale by Viollet-le-Duc that we remember to have seen. It is Classic, it is true, "with a difference;" it is Classic treated in a manner of Viollet-le-Duc's own, but it rather disposes us to wish that he had turned his thoughts more to this school of architectural design. This is certainly a much more effective piece of architecture, in regard to detail, than the west front of the Gothic church named above. It is impossible to describe or define the peculiarities of detail without the drawing to refer the reader to. The general effect is that of Classic designed by an architect who is accustomed to group piers and shafts, &c., on a Gothic and not on a Classic principle. Two of the most interesting and valuable items in the collection are specimens of Viollet-le-Duc's beautifully neat, and at the same time effective and picturesque, pen-sketching. One of these is a view of Florence from San Miniato, reduced one-half in size, with an immense amount of detail of the distant city in it; the other, a drawing of the front of the quaint, heavy, Romanesque church at Surgères, a beautiful piece of architectural drawing with the free hand, in thin, clear lines, with sufficient touching to give a little effect to it without spoiling its architectural sharpness and accuracy. We commend this drawing to the attention of some of the gentlemen who pride themselves so much on their proficiency in the "scratchy" style of architectural sketching. Altogether this is a most interesting and suggestive collection of drawings, full of hints, and we hope there are a good many more "parts" to follow, and that buyers of them will be found in England.

Stoke Newington.—An estate, comprising rather more than four acres, has been let by tender by Mr. Banister Fletcher, to Messrs. Smith & Goodman, and the Court of Chancery having approved the terms, the roads are being made and the houses built. This will add about 120 houses to the great number now being erected around London.

GOUTHIÈRE, THE CHASER AND GILDER.

WE not long since had occasion in these columns to tell our readers something of the life and labours of "Boulle," the ingenious and talented cabinet-maker of Louis XIV.'s court, and whose works, though the world has been recently somewhat astonished to learn were of such excessive costliness, have never, within the last two centuries, failed to command a high commercial value among art-lovers. The same may be said of an artist of more recent times, perhaps even less known to the public at large, but who holds with collectors a position of scarcely less importance for the extremely choice and refined character of his productions,—Gouthière, the bronze-chaser of the end of the last century, some of whose creations in the Hamilton Palace sale have realised sums which, if they appear to the public capriciously exorbitant, scarcely exceed the amounts originally bestowed upon the artist by his wealthy patrons. Thousands of pounds for pieces of furniture, enriched with elaborately-chased bronze-gilt ornaments appear facts to be accounted for only by the familiar caprice of the collector. Such, however, is not entirely the case. There exist, to show us in the present day how work was paid for in the past, the original accounts, by which we see how the skilful artist was remunerated. Gouthière, of whom little personally is known, was largely employed in the extravagant reign of Louis XVI. by a nobility whose magnificence may be said to have often been more noticeable than their taste. Year by year he filled the sumptuous mansions of his patrons with his wonderful work. His powers, indeed, cannot be said to have been overlooked by his contemporaries, and among his warmest admirers was the royal favourite, Madame du Barry, from whom, somewhere about 1771, we have evidence that Gouthière received for work executed by him no less than 36,000 francs. The same year the artist assumed the title of "chaser and gilder to the king." The Du Barry's patronage of the young workman we still see continued in decorating her house at Versailles, and the still more wonderful *pavillon* which the frail favourite was setting up at Louveciennes, or Luciennes, as it is termed, at a cost which, even for the extravagance of the close of the last century, astounded the public.

Some slight idea may be formed of the sumptuous taste of this lady (who, like most of the royal favourites in France,—like Diane de Poitiers and the Pompadour,—was a passionate lover of art), when we gather from her bank account a few of the items of her expenditure: For goldsmith work and jewelry, 2,280,763 *livres* (francs); for furniture, pictures, and vases, 115,918 francs; for painters, carvers, gilders, &c., 370,108 francs; the bill of Cagny, the carver and gilder, alone is 90,955 francs; and the gilding of one bed is set down at 5,945 francs. The total comes to hard on 6,500,000 francs.* The Du Barry,—of whom a cynical contemporary remarked that she spent more than the mistresses of ten kings united,—cost the nation, it has been calculated, considerably over 10,000,000 or 11,000,000 francs. When, in in 1791, her diamonds were stolen,—it can be imagined what a talk there was at the time,—they were valued at more than a million and a half; the *commode* in which they had been kept,—a gem in itself, delicately ornamented with inlaid Sèvres porcelain, — was alone worth 80,000 francs. Sums such as these given by the Faubourg Saint Germain were not uncommon in the days that preceded the Revolution, when the Faubourg Saint Antoine was starving. The king is known to have paid the queen's cabinet-maker, Rœntgen, of Neuwied, no less than 80,000 *livres* for a marquetry and bronze-decorated sécretaire, to be placed in his study. When it is remembered how far more valuable money was in those days, say about four times its present purchasing power, perhaps the sums given of late, and which have been pronounced so exorbitant, may appear more reasonable.

Gouthière as an artist is as much the creation of this period of luxurious and refined expenditure as was the Du Barry herself, who in her *pavillon* at Luciennes found more than ample work for the king's chaser and gilder. In the memorandum of the architect Le Doux the entries against Gouthière's name for work

* Baron Davillier, "Le Cabinet du Duc d'Aumont," &c. Paris. 1870. 8vo.

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executed by him are constant, and some picture can be formed of the bower of the Du Barry by the items mentioned, when we find Gouthière's expenses for the bronze chasings used in the *pavillon* amounting to 81,739 livres (the oval salon is set down at 31,272 livres, the *salon carré* at 19,706 livres).

As those in any way familiar with Gouthière's work know, it is not as a designer in the great style that he excelled; it is essentially to the details that he devoted his talent; minute medallions, and delicately-chased wreaths of flowers adorning cabinets and other pieces of furniture, the details of chimney-pieces, cornices, door-handles, &c. The fame of Madame Du Barry's *pavillon* decorated in such style as this can be understood. "It would be impossible to see," remarks a Paris guide-book of the beginning of this century, speaking of the departed glories of Luciennes, "anything more precious or more finished than this bronze work of Gouthière's."

Though not long after commencing this marvel Madame du Barry lost her royal lover, she was not, it would appear, prevented from continuing the decoration, as we should call it, of her home at Luciennes, which Madame Vigée-Lebrun, the witty lady painter of the last century, has spoken of with such admiration, having visited the hostess. "Every day,"—we quote from the English translation which appeared not long since of the lady's charming "Souvenirs,"—"we took our coffee after dinner in the Pavilion, so renowned for the taste and richness of the ornamentation. The first time I saw it Madame du Barri said, 'It was in this saloon that Louis XV. did me the honour to dine; above it there was a tribune for the musicians and singers who played and sang during the repast.' It was a delightful saloon, the view was splendid, and the chimney-pieces and doors were of the most elaborate workmanship; the locks were masterpieces in their way, and the furniture was of a richness and elegance beyond description." In spite of the growing seriousness of political affairs, up to within almost a few months of her execution Madame du Barry appears to have continued to employ Gouthière in the extravagant decoration of her pavilion at Luciennes. A short time after the death of the poor lady, in accordance with the custom in such cases, the authorities inventoried all her confiscated property; some few objects escaped, among them may be mentioned the familiar picture of the "Cruche cassée," by Greuze, now in the Louvre Museum; the rest were either destroyed or stolen. During many years, it would seem, Gouthière had not received any remuneration for his work, and we accordingly find him after the sale putting in a claim for the sum due to him, amounting in all to the modest figure of 756,000 livres (!). In vain he represented the years of labour he had expended on Madame du Barry's house, and the extreme costliness of the work he had executed for her; the chasing of one pedestal and some accessories he valued at 50,000 francs, the mounting at 46,000 francs, the gilding at 63,000 francs; three other pedestals he sets down at 420,000 francs. Though the poor artist consented to reduce his claim to 640,000 francs he received not the slightest remuneration. Many years after, in 1836, Gouthière's son revived the claim against the heirs of the Du Barry, and after considerable litigation received but 32,600 francs.

Like his patrons, the worthy old chaser may be said to have been ruined by the Revolution. A few years after his failure to receive any answer to his claim against the Du Barry estate, he made a fresh appeal, but again without success, and in 1806 we find the old artist, the favourite of princes and the aristocracy, dying in positive want, in the workhouse. In the ruin and dispersion of his patron's property, the delicate marvels of design and manipulative skill with which he had enriched their homes were, like so many other artistic treasures, scattered to the four corners of the earth. Scarcely less terrible than the destruction of life during the wild early days of the Revolution were the wanton and wholesale dispersion and annihilation of the property of the aristocracy. In such times, when dear life was in peril, it can be understood that little but their jewelry could be carried away by the *émigrés* who fled from their country to England, to Italy, and to Germany. What remained behind in their stately town mansions and old country châteaux was confiscated by the revolutionary Government, in many cases totally destroyed or disposed of, to swell the public funds. When the palace of the Tuileries was sacked, on the night of August 10th, the furniture was thrown out of the windows by the infuriated mob, and at Versailles nearly every piece of movable property was sold to the dealers. A Government commission inventoried all the objects of value and arranged for their sale. Interesting indeed must have been these auctions, when the property of "le nommé Louis Stanislas Capet" (as the king was tersely styled by the authorities) came to the hammer, or a few days later the contents of the wonderful house of "La femme Du Barry," or "La femme Victoire Capet," &c., as the various members of the royal family were termed.

The inventories of the period, the sanguinary 1793, make constant mention * of such and such articles "to be destroyed," "to be burnt 158 feudal pictures, *tableaux de féodalité*,—meriting neither description nor estimation." Sale after sale took place, pictures, tapestries, furniture, bronze, marble, and china literally choked,—we have evidence to show,—the shops of the pettiest dealers in Paris. In the midst of such political excitement as then reigned, it can be understood that few of these treasures remained in France. The emissaries of our country and of Russia were especially active, and carried off almost everything of value. It is easy to see how many of the homes of our wealthy nobility were enriched with the spoils of unhappy France. Hamilton Palace owed some of its choicest treasures to the French Revolution. Among these, the works of Gouthière have always held, in the gatherings of the Duke of Hamilton, a high place, not alone because more than one of the pieces of furniture which the bronze gilt chasings, by Gouthière, so delicately adorn, once belonged to the unfortunate Marie Antoinette, but because they are known to be positively unique creations of an art which is perfect in its kind. Gouthière may be regarded as (he at least so called himself) the inventor of mat gilding, *dorure au mat*, and the story goes that one day Marie Antoinette mistook for a work in gold, a rose of chased bronze gilt, presented to her by Gouthière. The delicate and refined richness of his designs,—for though he sometimes followed the designs of others, he was an artist himself,—may be said to have no equal, and when he united his skill with that of the Chinese in their choice old lacquer-work, it can be understood how beautiful is the result of the contrast of the richly-chased bronze and the black lacquer, and how highly the work is appreciated. His touch is one that once seen can scarcely be mistaken, and though he had not a few imitators, he may fairly be said never to have had a successor. Germain and Auguste, as bronze chasers, are known among many other contemporaries. Martincourt, Gouthière's master, is another bronze chaser of the reign of Louis Seize; and Philippe Caffieri, who, though he may be said to belong rather to Louis XV., died when the marked style of that reign had been succeeded by the more classic symplicity that is usually associated with the succeeding period,—a simplicity which, it may be remarked, commenced to assert its reaction against the *rococo* under the double action of the refined Mdme. de Pompadour and the discovery of Pompeii and Herculaneum, ten or fifteen years previously to the accession of Louis XVI. There was, however, as may be imagined, a large body of bronze and metal chasers in Paris actively employed in the last century,—decorators of the furniture, mounters of the porphyry and agate vases, the jasper and granite tables with which the French delighted to decorate their apartments. The traditions of the art were continued when the disturbances of the Revolution were over; and the gilt bronzes of the "Empire," meagre as may be their artistic merit, will be found to retain all the honesty and solidity of workmanship which distinguished the older chasers and gilders who, not content with gilding their bronze work, almost invariably overgilt their gilding, *dorure* and *sur-dorure* being an item often noticed in their account.

Gouthière, like Boulle, like our own Chippendale, and like so many other artistic workmen, merit a higher place in the esteem of the public than they at present occupy. They are the true little masters of art, with whose skill it is the duty of our museums and our art-publications to make us all acquainted. There is a want of such sturdy workmen in the present day; the traditions in which they acquired their skill, and which they handed down to their successors, have been allowed to decline, and without an emulating acquaintance with their struggles and their creations, we can ill hope to rival their industrious and modest careers.

* Baron Davillier, "Vente du Cabinet du Duc d'Aumont." Paris. 1870.

SEVENTEENTH-CENTURY IRONWORK.

IN connexion with a visit paid by the Architectural Association to the collection of ancient works in wrought iron brought together by Messrs. Gardner, of West Strand, a paper on "The Art of the Blacksmith" was read by Mr. G. H. Birch. We print the latter portion of it:—

During the fifteenth and sixteenth centuries the prominence hitherto given to the hinge sensibly declined. Partly from the reason that it had become the fashion to make more of the wood-work, and to enrich it with carving or moulding, the hinge now played a very secondary part, and in some cases it was simply a band of metal passing behind the perpendicular mouldings of the door, and terminating in a *fleur-de-lis*, but the door was also thickly studded with nail-heads. In the screen work and grilles of this period of the fifteenth century a like decadence was manifest. The tombs of the great still required grilles to protect them, but the designs of these were generally stiff and poor. The screen of Henry V.'s chantry at Westminster is typical of this, and its very proximity to the grille of Queen Eleanor's tomb makes the decadence the more apparent. But while the hinge and grille decreased in beauty, more attention was paid to locks, fastenings, and door-handles, many of these being very beautiful. There is a very excellent example of a lock at Ely Cathedral, and at Beddington Hall, near Croydon, and in many other places. The railings round the tombs of Edward the Black Prince, Canterbury Cathedral, and Henry IV., and that round the tomb of Simon de Langham, Archbishop of Canterbury, in the Chapel of St. Benedict, Westminster Abbey,- very similar to the two first-mentioned tombs,—make up in strength what they lack in beauty, and seem to have been the prototypes of those miles and miles of iron railings with which we are so familiar in London.

At Arundel Church, Sussex, there is a light and graceful iron grille in the blocked chancel arch: the design consists of upright standards and cross bars, and small cusped arching between, and a battlemented cornice enriched with alternate roses and lions' heads. It is much to be regretted that the full beauty of this elegant grille cannot be properly appreciated in consequence of the ugly brick wall which the Duke of Norfolk has caused to be built immediately behind it, in order to enforce his legal rights to the chancel. The very existence of this grille testifies that whatever those legal rights may be, the parishioners, although debarred the use of the chancel, were certainly not debarred the sight of it through this grille, nor was the effect of a beautiful interior ruined by such an act of vandalism, worthy of the worst days of those Puritans who divided Exeter Cathedral with a brick wall between the nave and choir. Extremes very often meet.

In Germany the open grilles of this period were of excellent design and workmanship. One very common form which they assumed was that of a cross-barred grille with a delicate pattern, occurring at intervals, of a cusped form; sometimes the bars were set diagonally, and there is an infinite variety of form of grille throughout Germany. Louvain, in the Church of St. Peter, has some excellent examples, and in the same church is an aumbry with simple but finely-designed hinges, lock plates, and handles. These aumbries, of which there are a great many in Belgium and Germany, deserve a very close inspection, in consequence of the extreme beauty of their metal work. In South Kensington Museum there is a very perfect carved oak one, called German, but more properly Flemish. The metal work on this is very original. In England we have but few examples, but there is a very good one in the Church of St. Mary, Richmond, Yorkshire. Nuremburg and Augsburg were the two chief places where this art was carried on. These two cities were then at the zenith of their prosperity, and their trade uninjured by those devastating wars which reduced them to misery, and from which Augsburg at least never fully recovered.

There is one particular phase of the smith's

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art in England which deserves more than a passing notice. The great impetus given to the industrial arts by the universal rebuilding which took place after the Great Fire of London exercised a considerable influence on the art of the smith; and there is the peculiarity attaching to the revival that the productions are essentially English, and are, unlike the contemporary work on the Continent, preserving an individuality prefectly marked and distinct. One might almost call it a "school," and it lasted for nearly a hundred years.

St. Paul's Cathedral, which was commenced in 1675, and the choir so far completed that it was opened for service in 1697, possesses some of the finest specimens of this date in the grilles and gates enclosing the choir, and although one is bound to confess that it was to a foreigner and not to a native artist that these are due, yet in many particulars they resemble genuine English work. One has but to compare these gates with others of the same date in France, to directly see the immense difference between them, as in the enclosures of the choir of the Abbey Church of St. Ouen, at Rouen, and at the Cathedral at Amiens. The artist's name was Tijau or Tijou, for the orthography is doubtful. In addition to these large gates, the original positions of which have been altered since the re-arrangement of the cathedral, there are several smaller grilles in some of the openings, and escutcheons to some of the internal gates with the arms of the dean and chapter very beautifully worked into the design. The whole of the ironwork at St. Paul's deserves a close inspection. The outer railings, which are partly cast, are of Sussex iron, and were made at Lamberhurst.

Most of the City churches have very good ironwork, especially in the sword-rests and communion-rails, some of the finest of the former being at All Hallows Barking, St. Andrew Undershaft, and St. Mary-at-Hill, and the latter at St. Mary Woolnoth. The altars of some of these City churches are marble slabs, supported on a frame of wrought-iron work. In the Church of St. Michael, Queenhithe, now destroyed, there was a very curious iron bracket,* with pulley and chain for the font cover, and some wrought-iron hat-rails. Though the hinges and locks of these churches are not remarkable, many of the vanes are curious. St. Lawrence Jewry, has a gridiron, in allusion to the martyrdom of the saint. St. Mildred Poultry, and St. Michael, Queenhithe, both destroyed, bore ships in full sail, St. Peter's, Cornhill, the cross keys, St. Mary-le-Bow has a flying dragon, and St. Antholin, Budge-row, had a very fine vane surmounted by a crown. The destruction of this church and spire, one of the most beautiful in the City, will ever be a lasting disgrace to those who brought it about. In the Church of St. Dionis Backchurch, at the west end, supporting the organ-gallery, stood square columns of open work, of wrought iron, and with very nicely wrought caps, but this church has also been destroyed, and the pillars probably sold for old iron.† Some of the brass chandeliers, where they have not been made away with, to be replaced by gas standards or brackets, are suspended by ironwork more or less ornamented and gilded, a good specimen having existed at the Church of St. Catherine Cree,‡ and there is still one remaining at St. Saviour's, Southwark. At St. Alban's, Wood-street, a curious hour-glass is preserved in a wrought-iron frame, a relic of Puritan times, and though hour-glasses and their stands are not uncommon, it is a comparative rarity when found in a church of the date of St. Alban's, Wood-street.

The smith also found plenty of occupation in making railings and gates for public bodies and for private houses, and wrought-iron handrails to staircases.

One of the most beautiful specimens of the art of the seventeenth century, is to be seen in a pair of gates at the end of a passage or hall in the building occupied by the managers and trustees of the Bridewell Hospital, Bridge-street, Blackfriars; the wrought leaves and scrolls are very rich, being designed for internal work, and date from very soon after the Fire of London.

The honourable and learned societies of Gray's Inn and the Inner Temple have fine scroll entrance-gates to their respective gardens; and scattered about in the suburbs, at Clapham, Chelsea, Fulham, Stoke Newington, Stratford-by-Bow, and Hampstead, are fine entrance-gates, whose designs are doubtless very familiar, since there is scarcely an old brick mansion with red tiled roof and dormer windows and walled garden that does not possess them. There is considerable beauty about these gates, and the manner in which the upright standards are alternated with panels of scroll-work, and the upper part enriched with scrolls and leaves and the initials of the owner, or his arms, worked in; some of this work, indeed, being very delicate and refined, especially with regard to the foliage. But the chief glory of the English school of this date is the wonderful work upon the gates now preserved at Kensington Museum, formerly adorning the gardens at Hampton Court Palace, and the work of Huntingdon Shaw. These are far superior to the gates in St. Paul's Cathedral, for the latter are a little too architectural in their treatment, Corinthian pilasters being freely introduced, while these Hampton Court ones are free from any approach to architectural forms in iron, and rely for effect entirely upon the bold curves and sweeps of the scrolls, the richness of the acanthus-like foliage, and the delicacy of the centre medallions. The wreaths, which are suspended from the top, are wonderfully modelled, some of the flowers introduced being almost as delicate as the natural ones they represent, or rather reproduce, in iron,—one medallion in particular, representing the rose of England, surrounded by small buds and leaves, being truly exquisite. At the top of each of the gates are some fine masks, in some cases surrounded by foliage, and each gate is different in design, although they resemble one another in general form. South Kensington Museum possesses six of these gates, one with a rose, another with a thistle,—this last one is superbly modelled, the peculiarity and bend of the leaf being accurately rendered,—another has the harp of Ireland, but with strings rent and broken, emblematical of the present state of that unhappy country, and three have the initials of William of Orange and Mary Stuart. If William's name in these days may not be quite so popular as it once was, and if he did but little for the country over which he was called to govern by a dominant party, at least he was the means of calling into existence these exquisite works of art, which hold their own against any foreign production, and placed the smith, Huntingdon Shaw, foremost among those who, working with stalwart arm, with anvil and hammer, were able to throw life and energy into the dull mass of metal before them.

In the staircase of a house in Lincoln's-inn Fields, No. 35, there is a wonderful specimen of a wrought-iron staircase rail. At present this wrought work terminates at the first floor, but there is evidence of it having been continued to the second floor, a panel having been once sold at Christy's for 40*l.*, which purported to have come from No. 35, Lincoln's-inn Fields, and had been removed in consequence of extensive alterations in the interior. The rail is composed of separate standards with scrolls and leaves, until it reaches the landing, which sweeps round a circular well-hole; round this the standards cease, and are replaced by an extraordinarily fine panel, in which one can recognise the same hand as in the Hampton Court gates; there is the same wonderfully modelled mask with foliage proceeding from it, the same sort of wreath depending in advance of the other work, the rich acanthus foliage partly masking the boldly-designed scrolls beneath, betraying the hand of Huntingdon Shaw or his school. The date would also fit, for this house and the next are traditionally supposed to have been designed by Christopher Wren, for the Solicitor and Attorney Generals about 1695-96, the date of the Hampton Court work. The centre oval medallion of this panel has unfortunately gone, and is replaced by some initials in cast iron, but it probably contained some of those beautifully modelled bunches of flowers which appear on the Hampton Court Gates.

There are many of these wrought-iron handrails in houses of the seventeenth and eighteenth centuries in London, and at No. 46, in the same square, is a simple but well-designed one.

At No. 5, Bloomsbury-square, the house in which, there can be very little doubt, the elder Disraeli lived, though it has been re-numbered, and standing at the south-west corner of the square and Hart-street, there is still a very fine wrought-iron hand-rail, which stops at the first floor, the principal staircase originally not ascending higher, but a secondary one having been used, and the design consists of a series of scroll standards, in which there are two sorts of foliage used, the lower portion having the acanthus foliage, and the upper part branching out into sprigs of foliage not unlike oak-leaves, and with delicate tendrils interspersed; the lower part of the scroll terminates in the centre with a wrought rosette of five leaves starting from a small central boss, the handrail which it supports being of wood.

Before leaving the locality of Lincoln's Inn Fields, so rich in historical associations of the past two centuries and a half, it will not be perhaps out of place to mention one fact that may not be generally known, with regard to Ancaster, or, to adopt its more correct name, Lindsay House. The most casual observer must have remarked two extraordinary tall red brick piers surmounted by mouldering Portland stone vases in the centre of the west side, and have been struck by the air of departed grandeur with which they are invested: these two giants are the survivors of six, four of which have disappeared, for between the present two in the front were two others, now gone, and two more stood at the sides enclosing the forecourt in front of the house. Between these red brick piers was once some very beautiful ironwork, both curious and quaint, but when it disappeared we know not, nor whither it went, though we know it was there at the commencement of the eighteenth century, and those who are familiar with views of old houses in London will remember that a similar railing existed at Powys House, not the one now called Newcastle House, at the corner of Great Queen-street, but the Powys House in Great Ormond-street, long since pulled down.

Many of the railings in front of old houses in London still show how artistic the smith's work was in these useful protections, before the everlasting spear-head became so universal. The very locality just mentioned, Great Ormond-street, has a very fine example, on the north side, of what the blacksmith in the seventeenth century considered necessary for an area railing, and this, to the credit of those to whom the property belongs, seems not only appreciated, but thoroughly taken care of. *Oh si sic omnes!* Lord Carrington's House, in Whitehall, has a very beautiful railing, with the old extinguishers for the links still attached; these may still be seen in many of our West-end streets and squares, and even in Bedford-row, a once fashionable locality.

There is also another point worthy of observation about these railings: where they return against the hall-door, on either side is placed a very beautifully-designed piece of ironwork, technically called a ramp. In Buckingham-street, Strand, and in many other streets in London, these are still to be seen.

These seem to have been the last expiring efforts of the smith. Birmingham was beginning to assert itself, and cast iron was to reign triumphant, and spear-heads, and spear-heads only, were to be the order of the day. One can point to almost the last effort made, and that is to be found in the railings or low screen in front of Somerset House in the Strand; there is an individuality about this, and a freshness of design, so thoroughly original, which will repay any one who will but stop and examine it. The thought must occur to every one who ever takes the trouble to think, that, supposing the material hitherto seemingly so inexhaustible, was to become scarce, and that the iron mines, like the coal ones, were to show signs of diminution, what an immense mass of material we could fall back upon in London only; for, take an ordinary street, and behold how iron has been wasted.

Happily for our times, we do now appreciate the smith's art, and we still have workers amongst us whose right hands have not lost their cunning. We have but to look around on these walls, covered with the wonderful achievements of past ages, and of different countries, and to note that among them are placed specimens of modern skill, which show that the lessons taught by these ancient examples have not been thrown away, and that there is a future for the art of the smith, and that the nineteenth century, an era which has been called "a servile age of mere copyism without any real art of its own," may prove a turning-point in the history of wrought iron, by utilising its capabilities, and adapting them to the requirements of the age in which we live.

* Now in the possession of Messrs. Gardner.
† These were fortunately not destroyed, and are in the possession of Messrs. Trollope.
‡ In the possession of Mr. Shoppee.

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THE CUSTOM OF HIRING FURNITURE.

OUR readers know very well that we have never confined our articles in any narrow spirit to mere technical questions connected with the erection of buildings, and we feel that so many of our readers have to do with the furnishing of houses that some remarks on the custom of hiring furniture may not be out of place here. In this instance we may strictly call this a custom, because it is a practice widely known and widely made use of. It is not a mere fluctuating practice, but it is a system employed by nearly every furniture dealer in the country. As we have more than once had to remark, the tendency among professional men, such as builders and architects, is to regard a practice which is by no means universal, and is only employed by some firms, as a custom, whereas, when this so-called custom comes to be legally criticised, it is found not to be a binding legal custom at all. But the practice of hiring furniture is now so universally known and adopted that it has recently been declared by the Court of Appeal (see Crawcour *v.* Salter, 51 *Law Journal*, Chancery Div., 498) to be one of which a court of law is bound to take judicial notice.

This decision was given in the course of last year; in the year 1875 the same question came also before the Court of Appeal, and then this tribunal considered that the custom at that time was not so well established that it ought to be taken judicial notice of. The Bench considered, however, that since that time the custom had become so common a practice that the previous decision of the Court could no longer be upheld. No better example could be found of the way in which mercantile practices can ultimately, if they are sufficiently vigorous, mould and change the municipal law, and equally also it shows how easily judge-made law accommodates itself to the social desires of the community. One of the chief results of the judicial recognition of this custom should not be forgotten by those who have to do with business matters. As a general rule, property in the apparent possession of a man who becomes bankrupt falls to the assignee as the representative of the creditors; for it is, legally speaking, in the order and disposition of the bankrupt. The effect of the judicial recognition of the custom of hiring furniture is to make this well-known legal rule inapplicable under these circumstances, and it negatives it, since, as Lord Justice James pointed out, "the foundation of the rule is to prevent a man from obtaining false credit by the possession of the goods." The long and short of the decision, therefore, is that the mere fact of furniture being seen in a house must not be taken to give rise to any presumption that it belongs to the houseowner. In both the cases out of which this question has arisen the bankrupt was an hotel-proprietor, but we confess we see no reason why the rule, if it applies to hotel-keepers, does not apply to every other householder; nor, indeed, did the Court apparently intend that it should be so confined. Therefore, it is perfectly clear that those who give credit to persons on the strength of a well-furnished house, do so at considerable peril. Further, as the furniture-dealer has never parted with his property in his furniture, and so, on the bankruptcy of the houseowner, can take it back, it is obvious that the legal view of the practice of hiring furniture is one which must help to extend the custom.

While it is, of course, in many cases no small convenience, it is clear that such a custom is, if very extensive, morally a bad one. It enables men to live on credit, to keep up appearances of a better position than they are entitled to, and it tends to relax rather than strengthen the valuable habit of quick ready-money transactions. A man, indeed, may now buy a plot of land, and yet, in reality, if he mortgage it he can scarcely be said to do more than hold it on credit; he may build a house on it and get money advanced upon the completed structure, and so pay for it by other people's money, and he may now without difficulty have it handsomely furnished, and yet not possess as his own a single arm-chair. We confess this is not a very satisfactory picture, and, judging from the universality of the last practice it is becoming more common than was formerly the case. Nor, again, can we believe that this custom is one which is good, either from the artistic or the business point of view. The hirer of furniture in the end undoubtedly pays more for it than if he pays for it at once, and the profit does not go into the workman's pocket. The quality of furniture for the hirer can never be so good as that which is prepared for the bonâ-fide purchaser. We refuse, too, to believe that the ordinary hirer of furniture can be as particular in matters of taste as the man who buys it at once, for, as we have said, the best articles are not likely to be let out for hire. Therefore, the tendency of the custom must, if it have a tendency, be against the elevating of household taste, and tend to its deterioration. But be that as it may, the legal effect of the custom is one of some importance, nor can its consequences, in other respects, be considered very satisfactory.

THE EASTWARD PASSAGE OF THE THAMES.

THE morning newspapers during the past week have contained numerous letters on the subject of the passage from the north to the south bank of the Thames, the greater part of the comments of which were anticipated in our remarks on the subject (p. 44, *ante*). One letter, however, was not so anticipated. It is from the pen of an engineer who certainly yields to no living man in the knowledge of the locality, regarded from the surveyor's point of view, and whose unbiassed opinion is entitled to the greatest respect. Mr. P. W. Barlow puts in a demurrer. So far from taking it for granted that a great traffic naturally exists, which is throttled for want of means of conveyance, he boldly denies that statement. The traffic from the north to the south bank of the Thames, he says, "is a mere ghost." Its non-reality is proved by the failure of the successive attempts to provide for its conveyance. It must be admitted that Mr. Barlow has a strong *primâ facie* case. We have all, possibly, taken this need too much for granted, forgetting that, as a rule, in England of all places in the world, things that are much wanted are apt to get themselves done.

Now we should not forget that a work which was at one time not undeservedly regarded as one of the wonders of the world was carried out by Sir Marc Brunel for the very purpose of connecting the north and the south banks of the river. This unprecedented undertaking was completed at a cost of 1,137*l.* a yard, or 454,000*l.* It was opened to the public in 1843. It is said, and said truly, that the want of approaches checked the development of the carriage traffic; but had this need for a crossing been so great as it is now, and as it was then said to be, can there be any doubt that the fact would have been indicated by a steadily-increasing flow of passengers? The uncertain part of the work was over; the risk was measured and overcome. The completion of the approaches was matter of money alone; and if the traffic had demanded the completion, we can hardly doubt that the money would have been forthcoming.

Many things, certainly, point in the direction indicated by Mr. Barlow. A good reason may perhaps be invented for the failure of previous efforts to do what we are now told is necessary; but the fact remains that they did fail. The first and famous tunnel was blocked for want of approaches. The second and minor tunnel, the sharp and rapid execution of which reflects so much honour on Mr. Barlow, is forgotten. Never did it attract traffic. Its situation was, apparently, admirable; but there was no demand for its services. In the same way the steam ferry has dropped out of sight. No one hears of it,—no one seems to use it. We are told that it is not suitable for the special traffic of the Thames. Why so? If people came forward to say, "Every step that has been taken with a view to link together the river banks has been a success. Each new line of communication has been pressed upon in such a way as to show that it is worth while to complete the best line practicable," then the question would rightly press for decision "What is the best method to employ?" As it is, Mr. Barlow's remark recalls that of the boy in Andersen's well-known tale of "The Emperor's Clothes." "But he has no clothes on," said the boy, and the people had to confess that he was right. "But there is no demand for means of transport," says Mr. Barlow. It is possible that he is not right. But it looks very much as if he were. Of all things, let us not be so inconsiderate as to not find out the truth of the secret thus whispered until after spending some couple of millions on a bridge.

Since we wrote these lines, we have read Sir J. W. Bazalgette's reply to Mr. Barlow. The statement of the engineer to the Metropolitan Board as to the number and position of existing bridges, is, of course, correct. It is not clear to what Sir J. Bazalgette refers when he says, "the locality is bad." Our preceding remarks as to the approaches to the Thames tunnel agree with those of the latter. But the argument as to the ferry does not seem to us to establish the case for a bridge. If the East London Railway now takes away the foot-passengers from the ferry, what need for further accommodation for them. And, it seems to us that the existence of a large traffic over a ferry would be not only an argument, but an argument *sine quâ non*, in favour of either widening London Bridge or making a new bridge.

The truth is, that it is rarely the case that any attempt to divert traffic from its natural channel has answered. Make the channel more convenient (as in the case of removing the toll from Waterloo Bridge), and the traffic increases. Make a new road for it, and, ten to one, it remains unused. For eight hundred years traffic has converged from either bank of the river towards London Bridge. Three attempts to divert it to a point lower down have failed. We do not say that a fourth attempt must fail. But, at all events, we require some much more definite proof to the contrary than has as yet been offered before we can consent to the experimental outlay of a million or more of money to accommodate a non-existent traffic.

THE ROYAL PRUSSIAN ACADEMY OF ARCHITECTURE ON FIRES IN THEATRES.

WE mentioned some months ago in these columns that the Berlin Academy of Architecture had been requested by the Prussian Government to deliver its formal and detailed opinion on the best means of securing theatres against dangers from fire. The terrible calamity at Nice, followed by the still more ghastly catastrophe at the Ring Theatre, Vienna, had directed the attention of architects in Germany as well as in all other civilised European countries to this subject. A special committee of the Rhenish and Westphalian Union of Fire Brigades had, soon after the Nice disaster, submitted direct representations on the question to Prince Bismarck, and had taken occasion to state that in their view the dangers from fire in theatres might be reduced to a minimum by improved designs and better methods of construction be ing introduced in the theatre buildings themselves. The German Chancellor requested the Prussian Ministers of the Interior and of Public Works to order an inquiry into the matter, and this they did by placing the entire investigation in the hands of the Royal Academy of Architecture. The first result of the deliberations of this body, dated November 2, 1881, has already appeared in the columns of the *Builder*. The conclusion of the Academy's labours, containing practical suggestions for improving the safety of theatres and other public buildings, has now appeared. It is entitled "Supplement of June 14, 1882, to the Opinion of the Royal Academy of Architecture, dated November 2, 1881." Of this document, which consists of two very unequal parts, entitled "Security against Fire" and "Protective Measures," we subjoin the following translation:—

A. SECURITY AGAINST FIRE.

1. Danger from fire in theatres is attributable chiefly to the employment, in the fittings and furniture of the auditorium, of materials that are easily inflammable, and which, after being kindled, burn rapidly, and propagate the fire quickly. This is more especially the case under a method

2. Of illumination which develops a great amount of heat, and produces hot gases of combustion, the effect being that as the latter rise to the ceiling, they render still drier and more inflammable whatever easily inflammable objects they may come in contact with on the way.

3. Complete security against fire can only be attained either by removing or avoiding the employment of combustible materials, or by avoiding a method of illumination by "open lights," and substituting for them a system of illumination with lights that are enclosed as far as possible in an air-tight manner.

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4. The magnitude of the danger from fire, of course, increases in proportion to the quantity of easily inflammable materials or objects, and to the number of the gas-flames or open lights. The peril accordingly increases in proportion to the size of the stage. And in case of an outbreak of fire, the danger to the audience increases in proportion to the number of spectators, or to the extent to which the auditorium is filled by them.

Hence, the larger a theatre is, the more urgent the necessity of its being built and fitted fireproof, in order to obviate the dangers in question.

In the case of small theatres having only pit or ground-floor seats, or at most only one gallery in addition, likewise in the case of dancing-halls or ball-rooms with a stage annexed,—buildings from which the public as well as the performers can quickly escape if fire breaks out,—the rigour of the conditions which such buildings should be required to satisfy in point of materials and style of structure, may be proportionately reduced.

Remarks on Sec. 1. The question how far combustible materials can be replaced by incombustible in the structure and fitting up of the stage of theatres without injuring or impeding the business of the stage, can only be settled by further experiments and by the test of stage practice itself. Attention, however, requires to be unintermittently directed to the question of the substitution of less dangerous materials for those now in use, and as experience discovers them, their employment ought to be ordered in place of what is less safe. Certain improvements, however, may be mentioned, the adoption of which has already been distinctly shown to be practicable without material difficulty. Thus in all permanent theatres, both on the stage and in the roof, the following parts ought to be constructed of iron, viz., all stairs or steps, scaffoldings, internal structures, pulling ropes, all fixed parts in the construction, the curtain frames and other framework, stands, &c. The same applies to the parts underneath the stage. These latter, moreover, ought to be provided with fire-proof beams and supports on which to rest the flooring of the stage.

All objects of wood and all textile fabrics used on the stage should be protected against catching fire by impregnation with suitable chemicals. It is now possible by chemical means to reduce the inflammability of these materials to such an extent that, when fire is applied to them, they simply glimmer away, and do not communicate the flame any further. The curtains, stage properties, and scenery might likewise be deprived, to a large extent, of their dangerous character as regards fire by the chemical impregnation of the linen before painting or by applications at the back.

Remarks on Section 2. According to the statements of Herr Fölsch, in his work on "Fires in Theatres, and the Measures requisite for their Prevention," p. 106, almost all the fires, without exception, which have broken out in theatres during the performance have arisen from open or imperfectly protected lights. The same author likewise shows that the numerous theatres which have caught fire shortly before the hour for the admission of the public, through some want of caution in lighting the gas or oil lamps, have been destroyed through open and badly-guarded lights on the stage side of the house. There is nothing surprising in this, since we find on the stage a large number of very inflammable objects with numerous jets of flame distributed among them, a brilliant illumination being necessary. Such flames must, in part, at least, be alternately lighted and extinguished, besides being fixed for the sake of the desired artistic effect in various positions about the stage. The slightest false movement, the failure properly to raise or drop a curtain or any other inflammable object, the breaking of a piece of the stage machinery for moving the decorations, is liable to bring easily combustible objects into contact with an open flame, and so to set the place on fire. The danger is materially increased by the general employment of gas. Danger attaches even to what is comparatively the safest method of lighting gas, viz., by means of electricity, for the apparatus at times does not work. An escape of gas then follows, the result often being that the next attempt to light the gas causes an explosion. In such cases inflammable objects at a considerable distance are directly set on fire or driven so as to come in contact with open jets. The danger is perhaps even greater when the gas fails to take light in a few isolated places which at the time escape notice. The inflammable mixture of gas and air which is then formed, and which will explode as soon as it reaches an open jet, may carry danger to the remotest part of the building. The extensive system of gas-piping in a theatre, too, is liable to be damaged, and thus become a source of danger by the escape of gas. In view of facts like these Herr Fölsch remarks that "while in all civilised countries there is a general prohibition of open flame in dangerous spots, this prohibition strangely enough is entirely ignored in the case of theatres, although, so far as is ascertained there is no country where such an exception in favour of theatres is granted by any statute or other legal authorisation." As a matter of fact, the German Penal Code (section 368, Nos. 6 and 7) contains a paragraph according to which any person who strikes a light, lets off firearms or fireworks in proximity to inflammable objects, is liable to a penalty of 20 thalers (3*l.*) or fourteen days' imprisonment, nor is any exception made to this law in favour of theatres.

It is an indispensable condition for safety from fire in theatres that, so long as large quantities of easily inflammable materials are employed in them, all open lights must be done away with. The means of doing this are supplied by *electric incandescent lights*. These generally consist of a carbon filament of a quarter to half a millimètre in thickness, and 10 to 15 centimètres in length, inclosed in a hermetically-sealed air-tight glass bell. When the carbon filament is rendered white hot by the electric current, and thereby made to give out light, the glass bell containing it is only slightly warmed, so that even an inflammable substance on touching it does not catch fire. Neither do the conducting-wires constitute a source of danger from fire, inasmuch as, when properly fitted up, they are scarcely sensibly heated while in operation. Nor, again, is there any danger to persons touching the conducting-wires of these incandescent electric lamps, when the lights are properly arranged, as the electro-motor force then employed is but small. For the same reason, even if the conducting-wires are broken, there is no danger, because the Davy arc does not appear at the fractured spot when the electro-motor force employed is small. If, through accident, a lamp is broken, the thin and highly-heated carbon-fibre, with the access of air, burns away so rapidly that there is no danger of anything taking fire. The only imaginable case where a fire could arise from the incandescent light is, when one of the thin branch-wires, running from the main conducting wires to the lamps, is fractured and forced into such a position as to connect the chief wires. In this case, owing to the strong current passing through it, the small wire may be made white hot, and so set fire to any inflammable materials that might be near it. This danger, although not absolutely removable, may, however, for practical purposes, be completely obviated by a good system of insulation and proper management of the current. Incandescent electric lighting is capable not only of meeting all the technical requirements of the stage, but of supplying it with the means of producing certain new effects. The conducting-wire may be readily and without any inconvenience applied at any point of the stage. By the simple turning of a handle or lever, any section of the lamps may be lighted up or turned down or off; and the colour of the light may be the yellowish-reddish tint of ordinary gas. Other colours may be obtained by having coloured glass in the lamps, and the white light may be gradually or suddenly extinguished, or replaced by coloured light. In short, the incandescent system is capable of producing all the effects desired in the way of light upon the stage.

It must be admitted that practical experience in the lighting of the stage with the incandescent system is as yet but scanty. The completest trial so far appears to have been made at the Savoy Theatre in London. No doubt, longer experience and further experiments are required before the incandescent light will be generally admitted perfectly to satisfy every requirement of the stage. In view of the tests the system has already stood, however, we unhesitatingly give our opinion that it appears calculated to reduce the danger of fire on the stage to a minimum without interfering with stage business.

Although the lighting of the auditorium of theatres involves far less danger than that of the stage, it appears desirable that electric lighting should be adopted in that and, indeed, in all other parts of the house. Whether this should be exclusively effected by incandescent lights, or whether, in the intervals of the performance, the auditorium should be illuminated with the white arc-light, is a question we will not attempt to settle. The defects formerly shown by the arc-light by pieces of the white-hot carbon points shooting off, and the danger thence arising, have already been removed by the rapid advance of technical science, partly by the supply of better carbons, partly by enclosing the lamps in glass balls enveloped in wire netting. Besides the greater security against fire, the electric light in the auditorium has another advantage, in that while developing a comparatively small degree of heat, it does not vitiate the atmosphere like gas. Hence the problem of the ventilation of theatres is rendered easier with a system of lighting by electricity than it is with gas.

In order to be secure against the extinction of the electric light, it is necessary in the case of a large installation to lay down two, or even three, independent illuminating circuits, each with its special engines and conducting wires, and to fix lamps in all the apartments connected with each of the separate circuits. In this way the passages and staircases may be lighted with electricity, as the safety will be equal to that of oil lamps, which may either go out, or even be left unlighted.

B. PROTECTIVE MEASURES.

1. In case of a fire breaking out on or about the stage,—such fires, when not instantly put out, commonly, as experience shows, extend with great rapidity,—the hot gases produced by combustion usually, owing chiefly to expansion, penetrate into the auditorium, and first threaten the safety of the persons in the upper parts of the house. Such gases in a short time exert a stupefying effect, and hence they tend to prevent the audience from escaping, and to hinder the firemen entering for the purpose of saving life and extinguishing the flames. Hence the necessity of the adoption of some incombustible, and, as far as possible, air-tight appliance to cut off the stage from the rest of the house, or to close the front of the proscenium against the auditorium. A number of sufficiently large apertures with chimney-funnels of sufficient height are also wanted above the stage in order to draw off the gases of combustion and prevent their entering the auditorium. The appliances for opening and shutting the apertures over the stage, and the mechanism for moving the iron curtain in front of the stage, ought to be accessible from various positions, so that the former may be readily opened, and the latter come down by its own weight.

2. If the gases produced by combustion penetrate into the auditorium, the persons in the upper galleries and tiers of the house are the first to be in danger. Hence these parts of the house more especially stand in need of numerous doors for letting the public out; they should open on to well-ventilated or ventilatable and well-lighted corridors and staircases. The proposal made by Herr Scheffler that a corridor should be constructed behind the gallery, therefore, deserves attention. This corridor, as well as those behind the boxes and pit, ought each to be large enough either alone or with the help of adjoining rooms to contain all the persons of the audience occupying seats on the same floor.

3. The apartments adjoining the stage, and intended for the accommodation of the *personnel* of the theatre, require special means of protection. They ought to be capable of being shut off from the stage so as to be as far as possible proof against fire, and where requisite fireproof stairs should be provided. The doors leading out of these apartments should also open on to a well-ventilated and well-lighted corridor. (Signed) SCHNEIDER.

The Royal Academy of Architecture,
Berlin, 14 June, 1882.

The Sunday Society.—The members of the Sunday Society visit the Grosvenor Gallery on Sunday next (July 16th), and on the first Sunday in August the Gallery will be open to the public by tickets, which may be had by all who send a stamped and addressed envelope for the same to Mr. Mark H. Judge, 8, Park-place Villas, Paddington. The Duke of Wellington has renewed his invitation of last year, and visits of the members of the Society will be made to the historical collection at Apsley House during the Sundays of July and August.

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THE HAMILTON PALACE COLLECTION.

IT might be imagined, by those who at a distance have followed so far the sale of the Hamilton Palace Collection, that by this time the chief treasures had been disposed of. Such, however, is not the case, and the fourth portion of the sale, placed on view in King-street, and sold at the beginning of this week, worthily took its place by the side of its predecessors. The promise held out by the names of Rembrandt, Velasquez, Van Dyck, Lely, Claude, and a number of other well-known painters; the expectation to see a fresh series of pieces of furniture which had once belonged to Marie Antoinette, with various other treasures, was amply sufficient to crowd Messrs. Christie's rooms.

Notwithstanding the rarity, amounting in many cases almost to uniqueness, of the objects exhibited week after week, and notwithstanding the very justifiable interest that the visitors to King-street take in these objects, still the pictures assert their own extraordinary position of dignity, in spite of the liberties that have been taken with many of their titles.

Genuine portraits by Velasquez are rarities which every day grow scarcer in the sale-rooms, and the Philip IV. of the Hamilton Collection may be said, away from Madrid, to be one of the most characteristic works of the master, not alone as a specimen of thoughtful portraiture, but as a superbly bold piece of technical execution. The rarity and instructive value of such a possession, which now the nation will own for ever, is alone to be appreciated by those whose study has led them to estimate as it deserves the grandeur of the Spanish painter of whom Sir Joshua Reynolds said that he could do in a few hours what it took him (Sir Joshua) weeks to paint.

But the most interesting picture of this portion of the Hamilton sale may certainly be said to be that described in the catalogue as a "Council of Eleven English and Spanish Statesmen," containing, in addition to the portraits of six Spanish and Italian noblemen, the portraits of Earls Dorset, Nottingham, Devonshire, and Northampton, and at the top of the table, on the right hand side, sturdy Robert Cecil. The work, a carefully-executed picture by the Spanish court painter of Philip III., Juan Pantoja della Cruz (as he should be called in the catalogue), is in the marked style of the Low Country artist Antonio More. It is many years since a picture of such extraordinary interest to the English public has been brought to the hammer, doubtless representing, as it does,—it being dated 1594,—some international incident that followed on the inglorious failure of the Spanish Armada. The portraits are marvels of dexterous minuteness, while the rest of the picture is scarcely less remarkable for the care bestowed on the details of the room decoration. The National Portrait Gallery, in obtaining this intensely interesting picture, has indeed enriched its already valuable collection with a treasure. By Coello, the portrait of the Duke of Alva may be said to have been a most appropriate accompaniment to the Philip IV. and the Spanish Council, while the Murillo, "The Sleeping Christ," is a characteristic example of the master.

In this fourth portion of the sale the French school was well represented, though chiefly in portraiture. An interesting portrait of Henry Stuart, Cardinal York, by the French painter Blanchet; a portrait of Madame de Maintenon, by Lebrun, representing the lady evidently at the outset of the devout period of her later life; a portrait by Vanloo of the gallant Marshal Saxe; a portrait of Marshal de Foix, by Rigaud, the so-called "French Van Dyck," a painter scarcely less industrious as a portraitist than our own Reynolds; the portrait of James, Prince of Wales, and his sister, when at Saint Germain, by Largillière, the very characteristic painter of the flowing robes and powdered wigs of the court of Louis XIV.; a most interesting and faithful full-length of Napoleon I., painted specially by David for the Duke of Hamilton; several Poussins (the "Entombment," very characteristic); a magnificent Claude,—the "Ariadne and Bacchus" of the *Liber Veritatis*; an amusing Fragonard, and a capital portrait of the Marquis de Marigny, brother of the Pompadour, by Tocqué; and two pictures very rashly attributed to the interesting French painter Jean Cousin.

As completing the interest in last week's show must be mentioned four small grisailles by Van Dyck,—portraits belonging to the famous series of *Icones* in which the Duke of Buccleuch's collection is so rich; an unmistakable portrait (by Lely) of the courageous Lucy, Countess of Carlisle, though the catalogue merely calls the work "A Lady in a White Dress"; a manly portrait, by the same painter, of David Leslie (afterwards Lord Newark); more than one Van Dyck, but none of superlative merit; an interesting sketch by Rubens; a so-called Van Eyck, beautiful but doubtful; a Lucas Cranach, dated, it may be mentioned, some ten or so years after the death of the painter; a curious Mabuse; several Breughels; and a fine Teniers. Respecting the two Rembrandts of the collection, the "Magdalen" and the "Prince of Guilders," such considerable doubt exists,—notwithstanding the merit, especially, of the former,—that we sorely doubt if the purchaser or purchasers will ever obtain that pleasure from their ownership which may be said to be the first element of possession.

Of pictures by English artists, the full-length portraits of George III. and his queen, Charlotte, by Ramsay,—strangely enough, labelled on the frame as by "Sir Thomas Lawrance" (*sic*), though the error is corrected in the catalogue; a superb landscape by Wilson; another by Gainsborough; two terribly cracked Ettys, with a few others, formed part of the last week's show, in which certainly the foreign schools may be said to have come out stronger than ours; indeed, in English masters, the Hamilton Collection, as shown, at least, in King-street, cannot be said to have been rich; nor are we even promised any marvels, except, perhaps, among the wonderful series of miniatures to be sold next week.

In this fourth portion of the sale the superb pieces of furniture may be said to have excited with not a few almost as much interest as the pictures. The three cabinets which once belonged to Marie Antoinette, two bearing her cypher, may be regarded as simple marvels of the decorative art of the eighteenth century. The elaborate and yet perfectly-restrained decorations of chased and gilt bronze from the hand of Gouthière, the French chaser of the reign of Louis Seize, setting off the rare black and gold Chinese lacquer, are delicacies of design and manipulative execution which the past seems alone capable of having produced. To those familiar with the artist's fame it can be understood what would be promised by a Gouthière cabinet that once had been in the possession of Marie Antoinette, and the result may be said to have fairly come up to expectation. The condition of these works is wonderful after the perils they must have run through, for, like so many other treasures of the Hamilton sale, they are relics of the wreck of the Revolution. It seems, indeed, a cause for regret that such a figure as that of the little marble Voltaire, attributed to Houdon, should be parted from surroundings so congenial. There, in the midst of the creations of a world which departed in the cataclysm he had so surely prophesied, the old philosopher of Ferney sardonically smiled as he smiled all through his long life. If the little figure does not possess the wonderful vigour of Houdon's famous seated statue of the philosopher which calmly gazes down upon the public from its place of honour in the *foyer* of the Théâtre Français at Paris, it certainly will charm its successive owners by the vivacity of its execution.*

The Sanitary Institute.—At the anniversary meeting, held at the Royal Institution, on Thursday, July 13th, H.G. the Duke of Northumberland in the chair, an address was delivered by Mr. Edward C. Robins, F.S.A., entitled, "The Work of the Sanitary Institute of Great Britain."

* At Saturday's sale the National Gallery acquired, for 6,000 guineas, the Velasquez portrait of Philip IV., as also a Steenwyck, for 195 guineas; for the National Gallery of Ireland, Mr. Doyle purchased Poussin's "Entombment" for 480 guineas; while the National Portrait Gallery acquired the Council picture by Pantoja della Cruz for 2,400 guineas. "The Infant Christ," by Murillo, was sold for 2,300 guineas; the Wilson landscape for 1,000 guineas; the Portrait of Cardinal York for 1,300 guineas; the four Vandyck grisaille portraits fetched 200 guineas; the sketch by Rubens 100 guineas (bought for France), one of the Breughels, 430 guineas; the Teniers, 900 guineas; Rembrandt's Magdalen, 210 guineas. At Monday's sale one of the Gouthière cabinets was sold for 5,400*l.*; the Marie Antoinette sécretaire for 9,450*l.*; and the companion commode for the same extraordinary sum. We have to correct a clerical error in our last week's issue, respecting the price of the Duc de Choiseul's writing-table, which was sold for 3,565*l.*, not 5,565*l.*

PROGRESS OF INDUSTRIAL ARTS IN GERMANY.

A SEMI-OFFICIAL report, all the more remarkable because it emanates from a Frenchman, proclaims the fact that not only have the German art industries made extraordinary progress, but are now in many instances able to compete successfully with the French on the French markets. The Union Centrale des Arts Décoratifs recently commissioned M. Germain Bapst to travel through Central Europe, and establish relations between this French society and all kindred institutions abroad. He was to visit all the museums, take notes of all improvements and bring back plans and drawings. The mission was a delicate one, as its practical object was that of enabling the French art-manufacturers to resist foreign competition. Nevertheless, it was attended with much success, and M. Bapst established profitable relations between the French Union Centrale and the following gentlemen whose names we give as being among the foremost promoters of art industries:—Baron de Heffner-Alteneck, of Munich; Herr Essenwein and Herr von Schörn, of Nuremberg; the Councillor Herr Graese, Herr Buttner, and Professor Graff, of Dresden; MM. Fusch, Kulesse, and Burg, of Breslau; Mr. Ostereicke, at Cracovia; and with MM. Charles and Francis Pulsky, George Rath, Xantheis, Hegedus, Henzelmann, Count Eugene de Zichy, and Count Apponyi, of Pesth.

From these sources valuable notes have been obtained concerning the methodic classification of objects and models, and notably their exhibition in suitable cases and light, two conditions often insufficiently studied by the conservators of museums and schools of art. This is coupled with drawings and plans of all the new museums of Germany destined to receive art or industrial collections. Thus it is modestly argued that if, in the great movement for the development of art study, France is the last among nations to construct edifices consecrated to the union of arts and industry, she may, at least, benefit by the experience acquired in other countries, and will raise a school perfect in its conception, suitable in every sense to all the requirements of artists and well calculated to educate the public and facilitate the studies of craftsmen or artisans.

At Munich, at Dresden, at Breslau, at Pesth, everywhere M. Germain Bapst met a small group of ardent regenerators who, either by collecting and classifying the vestiges of ancient art, or by stimulating the ingenuity and taste of the artisans around them, sought to revive the wholesome art doctrines of the past and harmonise them with the improved methods and increased facilities of modern manufacture. To M. Bapst the Hungarian art-work presented the most attractive features, though he renders full homage to the skill and great efforts of the Germans. At Vienna he was much disappointed, finding that the museums were not classified with the science of the Germans, and failed to display the taste of the Hungarians.

In Germany, M. Bapst thought that the progress achieved during the last four or five years is absolutely menacing the continued prosperity of several French industries. This result has been brought about principally by the increasing efforts and the impetus given by the Dresden school of art and industry. This establishment is directed by Professor C. Graff, and consists of three hundred pupils, who work at industrial drawings and supply models or designs to the manufacturers of furniture, tissues, jewelry, lace, decorative wall-papers, &c. If a manufacturer is in want of some designs or models, M. Graff explains the subject to his pupils, who compete with one another to attain the desired effect. It is the outcome of such a course of studies which is ultimately supplied to the manufacturer, who is thus certain of obtaining a design of merit. Nor does this institution content itself with rendering services to those who desire its assistance; on the contrary, Professor Graff is constantly seeking out industries where the products are not creditable from the artistic point of view. To these inferior manufacturers he addresses patriotic reproaches, and finally supplies them with models and designs, so that the goods they produce shall no longer offend the artistic taste he has taken such pains to develop.

M. Germain Bapst lays special stress on the excellence of the cabinet work of Messrs. Turpe and Friedrich Bernhardt. The school of

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arts and industry seeks to revive in the models that it gives out, the old Flemish-German style of the sixteenth and seventeenth centuries, and these are executed with rigorous minutiæ and the most delicate care. In goldsmiths' work, M. Bapst describes Herr Henninger, of Berlin, as a master endowed with great taste. For wall-paper, with designs modern in style, and each admirably suited for its special destination, the work of Herr August Schutz at Wurzen, and of Herr Ernest Schutz at Dessau, is so excellent that we are assured it will "confound both French and Belgian manufacturers." Finally, the silk and cotton tissues of Elberfeld for the covering of furniture are so perfect in style and quality that a large quantity are actually exported into France, and are now competing successfully with the products of the Lyons manufacturers. M. Bapst, impressed by all these facts, entertains the liveliest fears as to the results of the next universal exhibition. He dates the present extraordinary and rapid development of German art industries to the effect produced by the International Exhibition of 1878, and suggests that, as the cost of labour in Germany is only half as great as in France, for goods of equal value, the advantage would be with the Germans.

The importance of these declarations are evident to all, and it is high time that French manufacturers should travel and ascertain for themselves what is being done abroad. To us it is satisfactory to note that on all sides, in all countries, the art revival is displaying its vitality, and growing in strength; but these special facts concerning Germany will add to the interest of the Nuremberg exhibition of arts applied to industry which is now opened. From the architectural point of view, the good taste in the details displayed in building the exhibition palace are in themselves, we are assured, well worthy of a visit. In any case, a curious expedient has been adopted which will attract attention. The basis of all the walls is to be protected by a drapery made of jute saturated in a chemical substance, probably alum, which will render it fire-proof. Perhaps the Nuremberg exhibition will be an appropriate confirmation of M. Bapst's report, and doubtless will draw many visitors curious to test for themselves the full value of the revival in German art industries.

FROM ABROAD.

The Hercules Bridge at Berlin.—The *Deutsche Bauzeitung* calls the attention of those interested in the preservation of relics of the art of past ages, to the possibility of rebuilding the above bridge at a point of the stream where the locality would insure such a height as to obviate any difficulties with respect to the navigation of the Spree. Two of the most celebrated artists of a century ago, Langhaus and Schadow, were jointly engaged on this work, the removal of which from its present position would seem necessitated by local circumstances.

The Sanitary Condition of Berlin.—In an exhaustive report, Dr. C. Skrzeczka has recently described the progress of sanitation in the capital of the German empire up to the end of the year 1880. He dwells forcibly on the improved state of such parts of the city as are in connexion with the sewerage system. As to the water-supply, it seems that many of the springs of the city contain an excessive quantity of chlorine. The activity of the authorities charged with the carrying out of the laws against adulteration has been exercised with respect to the beer which forms such an important element in the daily sustenance of the German nation. The general result of the investigation goes to prove that injurious substances are but rarely met with, such ingredients as are sometimes used in place of hops being bitter products of a harmless character. The growing demand in this country for German beer is therefore not to be regretted.

Russian Cement.—According to a circular recently issued by the Russian Government to the leading railway companies, it is notified that there has hitherto existed an ungrounded prejudice against the use of cement of native manufacture, preference having been shown to the imported article, more particularly of English make. It is remarked that the Russian product has given complete satisfaction in its use during the construction of the Alexander II. Bridge over the Neva, the Alexander Bridge over the Volga, and Msta Bridge, on the road built to avoid the ascent at Werebjinskaja. The Russian cement is described as being of extreme fineness in its triturated state, and the fluid mortar made from it is said to possess an exceptional degree of resistance. Amongst other measures enjoined in the Ministerial circular is a provision for any technical conditions attached to concessions, &c., to be based on the employment of Russian cement when it is procurable; the use of other kinds being only sanctioned when the home-manufactured article is not readily obtainable.

The Sistine Chapel at Rome.—The *Vossische Zeitung* gives currency to a statement that the Pope has decided on considering the above noted church as one of the most important monuments of Italian art, and has resolved on ordering the cessation of all religious ceremonies within its walls. The world-renowned frescoes of Michelangelo have, it is stated, suffered so much from dust and from the effect on the air of the burning of numerous candles, that the above step has become necessary for the preservation of these wonderful examples of religious art.

PREMIUMS AWARDED BY THE INSTITUTION OF CIVIL ENGINEERS.

THE Council of the Institution of Civil Engineers have awarded the following premiums:—

For Papers read at the Ordinary Meetings.

1. A Watt Medal and a Telford Premium to Dugald Clerk, for his paper on "The Theory of the Gas-engine."

2. A Watt Medal and a Telford Premium to Joseph James Coleman, for his paper on "Air-Refrigerating Machinery and its Applications."

3. A George Stephenson Medal and a Telford Premium to Thomas Fletcher Harvey, Assoc. M. Inst. C.E., for his paper on "Coal-washing."

4. A Watt Medal and a Telford Premium to William Proctor Baker, for his paper "On the Various Systems of Grinding Wheat, and on the Machines used in Corn Mills."

5. A Telford Premium to William Henry Wheeler,* M. Inst. C.E., for his paper on "The Conservancy of Rivers; the Eastern Midland District of England."

6. A Telford Premium to Leveson Francis Vernon-Harcourt,† M.A., M. Inst. C.E., for his paper on "Harbours and Estuaries on Sandy Coasts."

7. A Telford Premium to Ewing Matheson, M. Inst. C.E., for his paper on "Steel for Structures."

8. The Manby Premium to Henry Joseph Butter, M. Inst. C.E., for his paper on "Forces and Strains of Recoil considered with reference to the Elastic Field Gun Carriage."

For Papers printed in the Proceedings without being Discussed.

1. A Watt Medal and a Telford Premium to John George Mair, M.Inst.C.E., for his paper "On the Independent Testing of Steam Engines, and on the Measurement of the Heat used."

2. A Telford Medal and a Telford Premium to James Mansergh, M.Inst.C.E., for his paper on "The Lancaster Waterworks Extension."

3. A Telford Medal and a Telford Premium to Wilfrid Swanwick Boult, Assoc. M.Inst.C.E., and a Telford Medal and a Telford Premium to John James Potts, Assoc. M.Inst.C.E., for their joint paper on the "Seacombe Ferry Improvement Works."

4. A Telford Premium to Charles Henry Moberly, M.Inst.C.E., for his "Account of some Tests of Riveted Joints for Boiler Work."

5. A Telford Premium to Robert Harvey, Assoc. M.Inst.C.E., for his paper on "Plant for the Manufacture of Iodine."

6. A Telford Premium to James Barron, Assoc. M.Inst.C.E., for his paper on "Buckie Harbour."

7. A Telford Premium to Patrick Walter Meik, M.Inst.C.E., for his paper on "The Bo'ness Harbour and Dock Works."

8. A Telford Premium to Harry Pasley Higginson, M.Inst.C.E., for his paper on "The Kawarau Suspension Bridge, N.Z."

The special thanks of the Council were voted to their colleagues, Dr. William Pole, F.R.S., and Mr. B. Baker, for their contributions on "Aërial Navigation," and on "Steel for Tires and Axles."

Gas Explosion.—In the evening of the 7th the base of the big lamp at the bottom of Preston New-road, Blackburn, blew up with a loud report, severely injuring a number of persons who were passing, and killing one. The explosion seemed to result from leakage, and it occurred when light was being applied by the lamplighter, who ran away and escaped unhurt. It shook the surrounding buildings and hurled huge stones 30 ft. into the air.

* Has previously received a Telford premium.
† Has previously received the Manby premium.

ARCHITECTURE AND THE ROYAL ACADEMY.

THE following is a list of the Royal Academy admissions, July 1882. Mr. R. Phené Spiers, master:—

Upper School.—T. J. Dalziel, J. C. Hambling, C. E. Holmes, C. P. Leach, H. W. K. Martin, E. W. Smith, E. A. Woodrow.

Lower School.—J. H. Ball, D. W. Bellhouse, W. D. Caroë, B.A., H. O. Cresswell, W. J. Gargery, F. Johnson, F. L. Lee, E. S. Norton, P. J. Popplewell, J. G. Sanky, H. A. Satchell, W. C. Rea, F. H. Tulloch, A. F. Vigers, G. G. Wallace, G. W. Ward, W. H. Woodroffe, E. Woodthorpe, B.A.

Probationers.—F. S. Capon, E. Crisp, C. D. Fitzroy, A. Forrester, W. J. Gibbon, J. J. Muller, F. P. Oakley, S. B. Russell, J. E. Sears, J. Thomson, W. R. A. G. Tucker, W. F. Young.

A BRISTOL ARCHITECT KILLED.

WE regret to record the death, under circumstances of a painfully distressing character, of Mr. J. H. Hirst, F.R.I.B.A., architect, of Small-street, Bristol. A servant at the deceased's residence, Avonhirst, Stoke Bishop, on coming downstairs on the morning of the 6th, found Mr. Hirst lying at the bottom of the staircase. He had apparently been dead for some hours, and subsequent examination of the body disclosed the fact that deceased had broken his neck. It is believed that in retiring to rest on Wednesday night he was either seized with a fit or missed his footing and fell down the stairs. Deceased had been in a weak state of health for some time past, and it is thought that his weakness might have prevented his making an effort to avert his fall. Mrs. Hirst and a portion of the family were away from home at the time. The deceased, who was an architect of considerable experience, had been for many years in practice in Bristol, and brought forward a scheme for constructing a new thoroughfare upon an easy gradient between Colston-street and the top of Park-street, and in connexion with which some rather extensive excavations were made opposite the New Theatre. Some years ago he took a warm interest in the Volunteer movement, and for a long time held a commission in the Bristol Artillery Corps. He was fifty-six years of age, and leaves a widow and numerous family.

Some of the best buildings in Bristol and its neighbourhood are the work of the unfortunate gentleman who has so lamentably passed away. Mr. Hirst originally came from Yorkshire. He has always kept up a connexion with this his native county, and for many years had a branch office at Harrogate, where he built St. Peter's Church, and many blocks of fine buildings. Mr. Hirst was deservedly popular in all the various walks of life with which he was identified, and his loss will be deeply deplored by all who knew him.

Collapse of an Hotel Roof in Manchester. Just before five o'clock on Saturday evening last, the roof of the Wheatsheaf Hotel, 64, High-street, Manchester, fell, causing great destruction and damage to property. The Wheatsheaf is a very old building, said to be the oldest licensed house but one in the city. The building is four floors in height, and of peculiar arrangement. Originally it consisted of the front premises and a yard, but subsequently the buildings at the rear were added to it, and the Wheatsheaf proper then comprised what is almost a square block, passages connecting the additional buildings. The proprietor is Mr. Wood, and recently he has carried out extensive alterations in the interior of the house, at a cost of some 1,500*l*. An examination of the premises which has been made leads to the supposition that the building fell from the inside. A cracking noise was, it is stated, first heard, and then the fall of the roof followed, the *débris* bursting through all the floors of that portion of the first block which is nearest Market-street, leaving the remaining portions of the building, or what may be described as the other wings, together with the contents, practically uninjured. The only way of accounting for the collapse, apart from the supposition that the building was struck by lightning (of which there is no proof, although a thunderstorm prevailed at the time), is that it was caused by decay, the supports of the building giving way through age. Fortunately no one was injured.

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THE BAVARIAN NATIONAL, INDUSTRIAL, AND ART EXHIBITION, NÜRNBERG.

OLD Nürnberg, the city of Albrecht Dürer, in which German art, at one period of its history, shone forth with a splendour which has been equalled, but never surpassed, has done honour to its venerable traditions by holding an exhibition which gives an impressive picture of the present state of the arts and industry of Bavaria. The exhibition buildings have been erected in the old park called the Judenbühl, outside the walls of the many-turreted imperial city, and at the foot of the old imperial castle, in which the green of trees surrounds the various edifices with a charming frame. The visitor to the exhibition enters the park by a broad avenue of trees, the first object to strike his eye being the reception-hall, a neat and well-decorated villa, through the pillared portals of which may be espied the Oriental splendour of its interior. The art pavilion, which is next seen, is not so happy in its exterior, but any shortcomings in an architectural sense are fully compensated for by its contents. The art exhibition which it contains gives us a picture of the development of the arts in Bavaria since the beginning of this century, consequently the period under King Ludwig I., as well as a view of the present state of efficiency of Bavarian art. By the manner in which this has been done, it is not too much to say that the art pavilion is the pearl of the Nürnberg Exhibition, and which will prove the principal point of attraction, especially for the foreign visitor. Joined to it by a covered lobby is the pavilion for industry and traffic. In the open court inclosed by this building a fountain has been placed, and from it a reading-room and the postal and telegraph offices are reached. The exhibition in the northern wing of this pavilion is especially instructive, being devoted to traffic; the southern wing is filled with objects relating to education. The hall which follows contains two complete railway trains, amongst which is a sleeping-car. This room, again, leads into the machinery hall, of an area of 45,000 square feet.

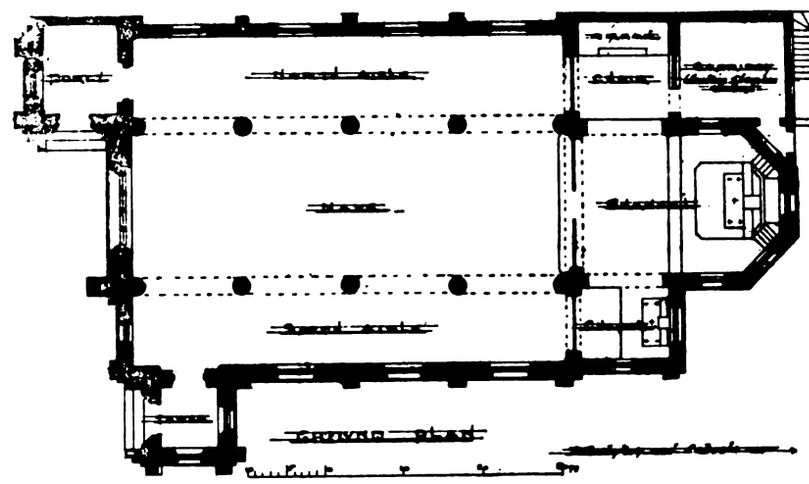
The most fantastic in its ornamentation is the principal industrial hall, which we illustrate. Although a blending of the Renaissance with the Indo-Oriental style may be objected to by critics, the edifice, as a whole, agrees very well in its appearance with its surroundings. This gigantic building, which is four times the size of the Stuttgart Exhibition of last year, contains in eleven groups the works of over 1,600 exhibitors. The efforts made in this department deserve recognition, if with quantity the quality of the exhibits is taken into consideration. The first place, perhaps, not only in Bavaria, but also in Germany, must be accorded to the art industry of München. Most remarkable are the manufactures of the gold and silver smith, and the products of the furnishing trade. We have no space at this moment to enter into the details of the exhibition, but the above rapid sketch may convey an idea of what is to be seen. The most instructive part is undoubtedly the fine-art department. The number of exhibitors, including the art section, is 2,850. The area covered by the exhibition is thirty acres; that by the buildings alone being over eight acres. It would not be right to overlook the efforts made in providing food and drink for the visitors. The national beverage, Bavarian beer, is well represented, and, let us hope, of the usual excellent quality. The pleasant wine of the Palatinate is also to the fore. There is nothing the Bavarian loves more than music. To satisfy his craving in this respect, concerts take place every evening in front of the principal restaurant. The park is illuminated at night by the electric light.

One point more in connexion with the exhibition must not be overlooked. When it was opened, on May 15th, it was completely ready in all its details. The catalogue, of over 500 pages, was finished the day before the opening It contains, besides the list of exhibitors, statistical and historical introductions, prefixed to the various groups and sections, and will thus be of permanent value. The exhibition was planned and carried out by Herr Dr. Stegmann.

Sir John Soane's Museum.—Professor Hayter Lewis, F.S.A., has been appointed a life trustee to fill the vacancy caused by the death of Mr. Mocatta.

CHURCH (R.C.) OF ST. FRANCIS OF ASSISI, MAIDSTONE.

AN account of this church, of which we publish a view and plan this week, was given on the occasion of the nave and western portion of it being opened by the late Bishop of Southwark.* The chancel and the remaining portions have now been completed. Mr. C. G. Wray, of London, is the architect.



Plan of Church (R.C.) of St. Francis of Assisi.

It is expected that the north side of the church, which is at present shut in by adjoining buildings, will shortly be freed from these obstructions, a deep cutting for the new railway from Maidstone to Ashford taking their place, by which an uninterrupted view of the church will be obtained for a considerable distance.

THE NEW HOMES FOR ORPHANS, SWANLEY, KENT.

THESE buildings, the foundation-stone of which is to be laid this day (Saturday) by H.R.H. the Prince of Wales, with Masonic ceremonies, are intended for the maintenance and education of orphan boys, and are being erected for the Committee of the well-known "Homes for Little Boys," at Farningham Admission to the latter, however, being by their regulations restricted to the absolutely homeless, while, on the other hand, admission to the existing Orphan Asylums can only be obtained by the tedious process of election, the necessity for a home at once, where fatherless boys could be received on payment of a small annual sum, was felt to be urgent; and this want the present buildings are specially designed to meet. The boys would be admitted at an early age, and, after benefiting by the advantages that this institution gives, leave it qualified to earn their own living.

As there will here be congregated at the same time boys of all ages, the initial idea of this scheme is,—as will be seen from the accompanying plan and view,—the provision of a number of detached houses in order to facilitate the classification and separation of the boys, and these houses are grouped round a central block of school and workshop buildings.

The buildings are arranged on the site in such a way that the principal rooms may have a southern aspect, and also command a view of the charming scenery in this neighbourhood. They lie high, and are pleasantly situated near the Farningham Homes, and close to the Swanley Junction of the London, Chatham, and Dover Railway.

The reception blocks, or Dame's Houses,—blocks D and F on plan,—are semi-detached, and are each intended for the accommodation of twenty-five boys, who, being very young, would be under the care of a dame, or mother, until they were sufficiently advanced to be transferred, firstly, to the Assistant Masters' Houses,—blocks C and E on plan,—where they would be under the influence of the masters at home as well as at school; and, finally, to that of the head-master,—block B on plan. Here, during the last and most important period of their stay, they, under the guidance of the head-master and two assistant masters, would be especially prepared to make their start in life.

The central block,—block A on plan,—comprises the school-hall, with class-rooms in connexion, on the first or principal floor; and, on the ground floor, the general stores and offices, and also the technical workshops. These are intended to be specially fitted up, as may afterwards be considered advisable by the committee, who desire that the boys shall have the advantage of a good technical as well as general education.

The total accommodation at present contemplated in the blocks, as mentioned above, will be for 120 boys, but ultimately it is the intention of the committee to complete the buildings, as shown on the plan, when they will be able to receive 200 boys; and still be in a position to provide for a future extension, if necessary.

While keeping in view the wishes of the committee, it has been the special aim of the architect to combine the best and most efficient arrangements with compactness of plan and economy of cost; and, although the general structural arrangements are, therefore, of the simplest character, the health requirements of the inmates have been considered.

With regard to the external treatment of the buildings, a simple yet picturesque effect has been aimed at in the general grouping, but the use of expensive materials has been avoided.

The walls are hollow, of stocks, with red facings, and very little stone is used except for sills, steps, &c. The contract for the first portion has been taken by Messrs. Martin, Wells, & Co., of Aldershott, who are carry ing out the works under the superintendence of the architect, Mr. Henry Spalding, of 91, Queen Victoria-street.

"CLASSICAL POESY."

THE allegorical figure of "Classical Poesy," by Edmund von Hofmann, and intended for the new Burg-Theater of Vienna, which we illustrate in this week's *Builder*, was one of the best works to be seen in the Austrian section of the International Art Exhibition held in the Vienna Künstlerhaus. The carefully-executed figure testifies by its pure lines and the high standard of its conception to a not common talent. Edmund von Hofman was born on November 2nd, 1847, and is consequently a young artist, who, independently of the future which is still before him, has already a remarkable past, having distinguished himself by a number of excellent works. The figure of "Classical Poesy" is intended for the centre projecture of the Löwelstrasse façade of the new Hofburgtheater, its counterpart being the statue of "Romantic Poesy," also to be modelled by Hofmann. With the figures, by Kundtmann, of Melpomene, Thalia, and Apollo, the two statutes of Hofmann's will be the largest which will adorn the new edifice. They are to be 11 ft. high, and in Marzono stone, a hard limestone. The block of stone for "Classical Music" had a weight of thirty tons. Edmund von Hofmann received his education at the Vienna Academy of the Plastic Arts, under the supervision of Professor Zumbusch, whence, having obtained the Roman Prize Stipend, he proceeded to Rome. He has executed some effective sculptures for the new Vienna Town-hall and the new University.

* See *Builder*, vol. xxxix., p. 544 (Oct. 30, 1880).

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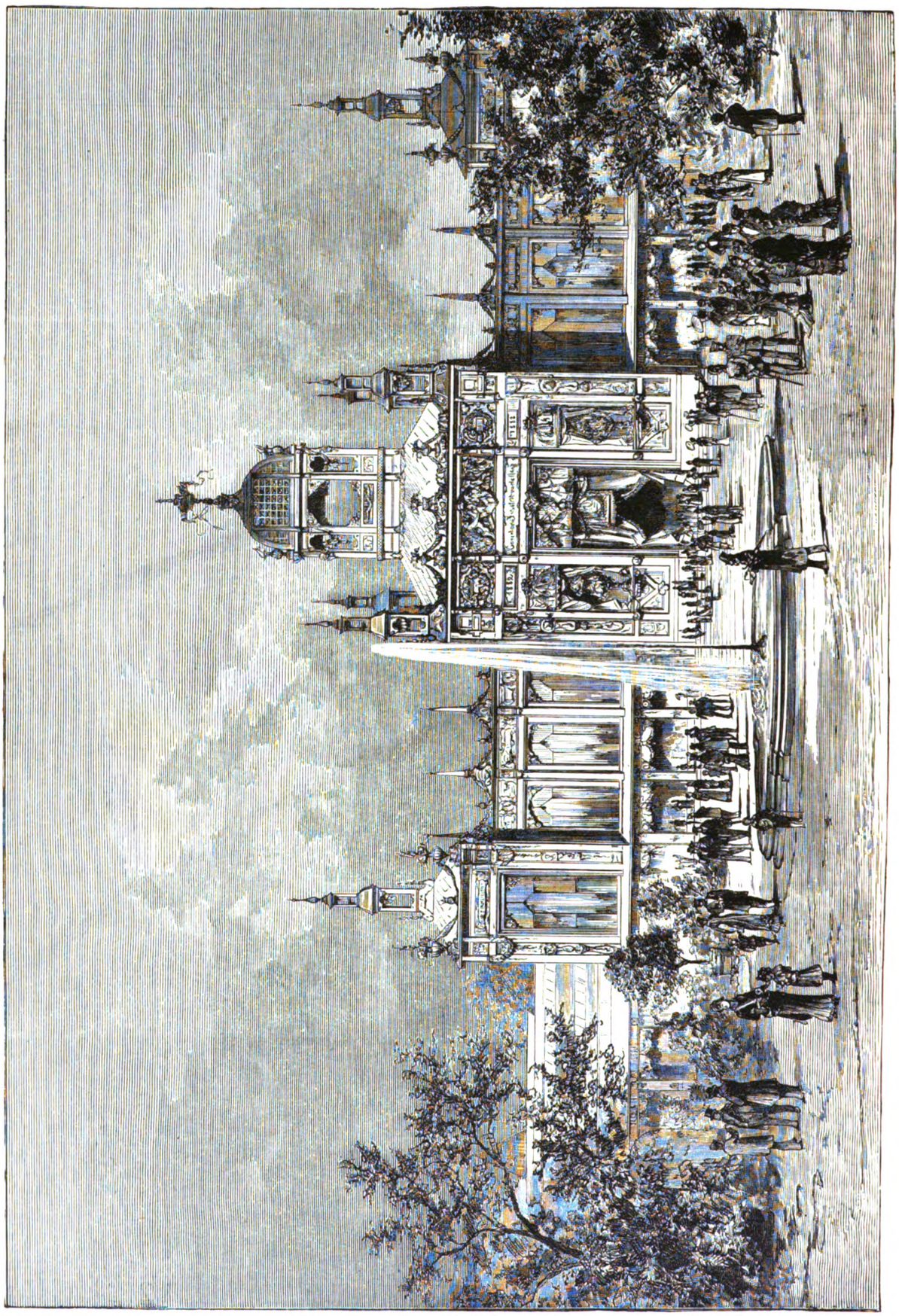

THE PRINCIPAL BUILDING, BAVARIAN NATIONAL INDUSTRIAL AND ART EXHIBITION, NÜRNBERG.

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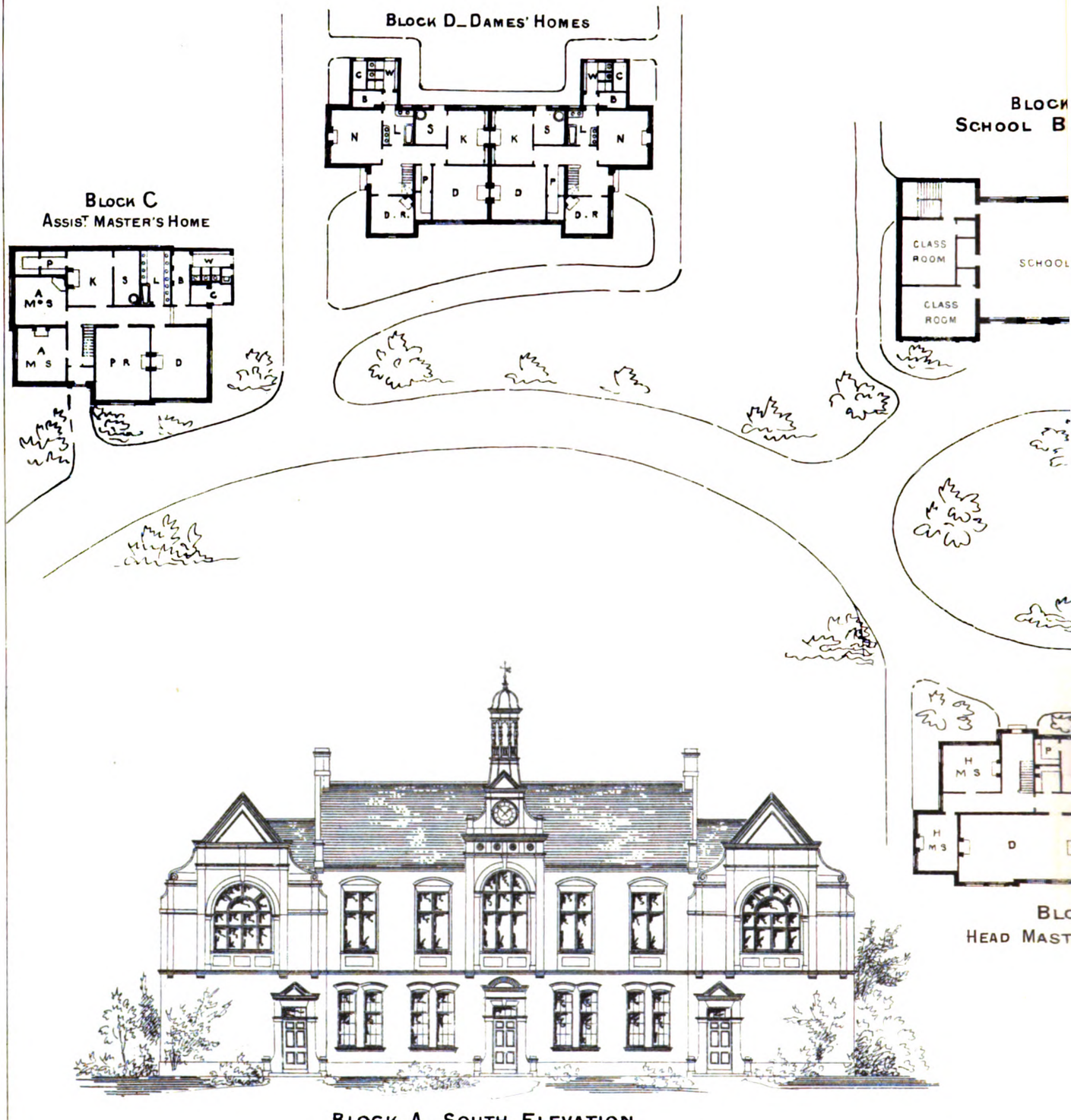
BLOCK D_DAMES' HOMES

BLOCK C
ASSIST. MASTER'S HOME

BLOCK
SCHOOL B



BLOCK A._SOUTH ELEVATION.

BLO
HEAD MAST

B ... BOOTS
C ..... COALS
N ..... NURSERY
L ..... LAVATORY & BATH
S ... SCULLERY
K ... KITCHEN
P ..... PANTRY
D .... DINING ROOM

SCALE FO

SCALE

Whiteman & Bass *Photo-Litho* 236 High Holborn

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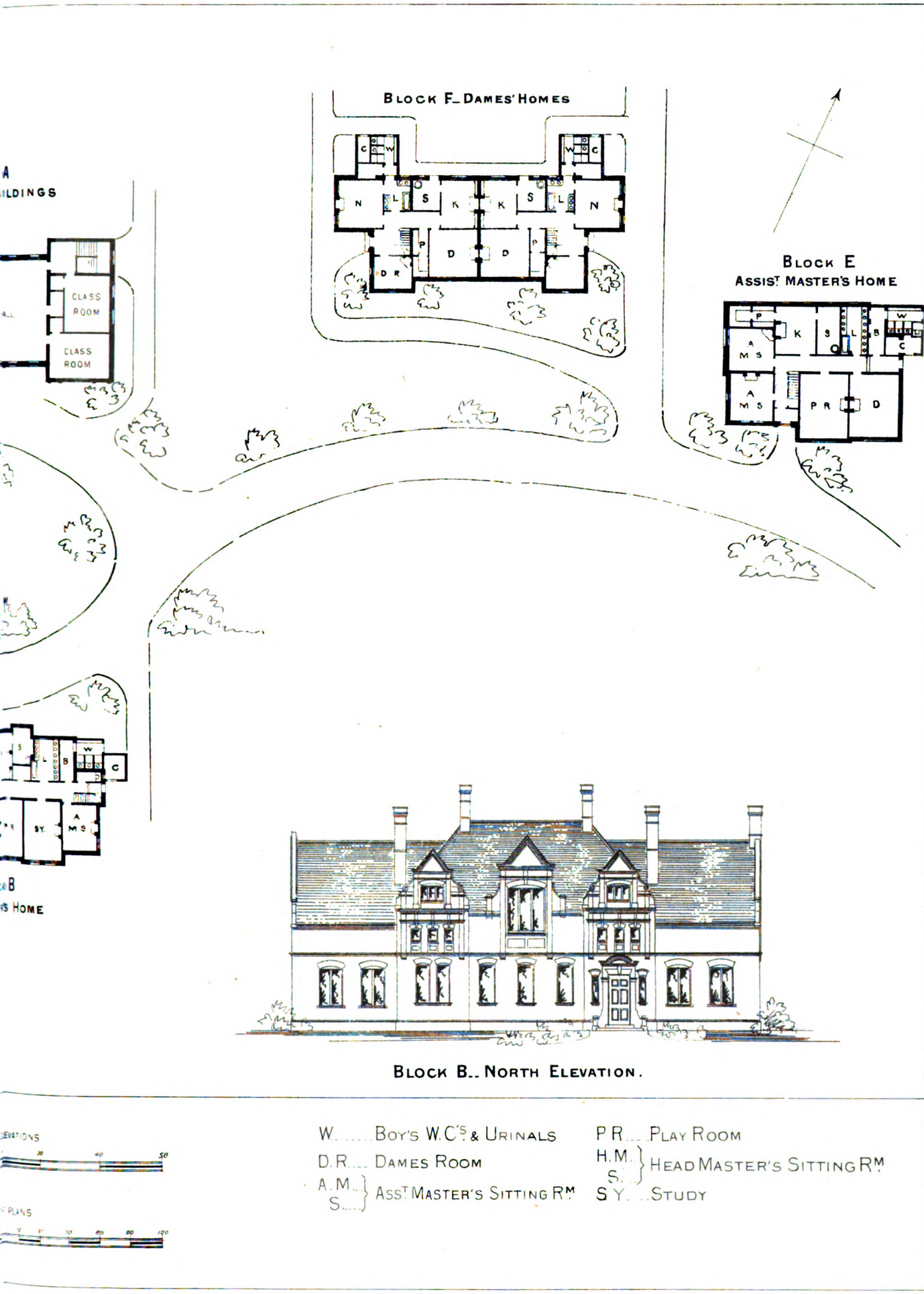

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ANLEY.—MR. H. SPALDING, ARCHITECT.

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THE (R.C.) CHURCH OF ST. FRANCIS OF ASSISI, MAIDSTONE.—Mr. C. G. Wray, Architect.

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"CLASSICAL POESY," ALLEGORICAL FIGURE FOR THE NEW BURGTHEATER, VIENNA.

MODELLED BY EDMUND VON HOFMANN.

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CHURCH DECORATION IN 1882.

FIVE HUNDRED POUNDS (and we should think much more will be spent before all is done) have been freely contributed to the decoration of a church in Surrey, and the experiment made in consequence is one which the architect will regard with no little interest. Contributed as a free, and we believe it may be added mainly an unasked, gift, the donation for the decoration of the Church of St. Nicholas, Guildford, is only the last of a series of munificent gifts, which, within a few years, have reared a new and handsome building on the site of one which had become unfit for the wants of the parish; have filled its windows with stained glass, have supported its services by a fine organ, and have rendered the tower vocal by a peal of new bells. As to the disposal of free offerings of this nature, criticism is silenced; although it may be permitted to express a regret that a provision of proper egress from the building, to the want of which attention has more than once been pointedly called, has not attracted the attention of the beneficent in preference to, or, at all events, concurrently with, the addition of ornament to the interior.

The object of the writer, however, is not criticism. It is our wish to attract the attention of those competent to form a correct judgment on the subject to the conduct of what we take leave to regard as a very interesting experiment. And this we wish to do in an architectural sense alone, without innuendo or *arrière pensée*. There are, of course, many people in this country who regard the introduction of colour into the interior of a church with unmitigated dislike, not so much on architectural as on theological grounds. Into that part of the question we decline to enter. There long has been, and probably long will be, room for the views of opposite schools on this subject. The architect who is familiar with the glorious churches of Italy, or with the sometimes even richer, though less known, ecclesiastical buildings of the Iberian peninsula, will feel disposed to regard the pictorial, rather than the ritual, excellence of a church-interior as that with which he is chiefly concerned. And it is from this point of view alone that we venture a word or two on the subject of interior decoration.

The question, as it seems to us, which is very aptly illustrated by the work in question, is that of the true canon of decoration, taking it for granted that decoration is desirable. It is the more necessary to make up our minds on this now, because there is a considerable conflict between the theoretically correct and the practically possible. The spirit of the old church builders, or even of their earlier predecessors, the builders of the noble temples of Jewish, of Grecian, and of Egyptian worship, has of late breathed in the fiery language of a great art writer, who has insisted on the necessity of the true, the thorough, and the unsparing in architecture, and especially in ecclesiastical architecture. As to the abstract truth of canons such as these we have no doubt. But what the architect has to do, ninety-nine times out of a hundred, is, not to carry out art canons regardless of expense, but to produce the best effect by limited outlay. Thus, all those rules (essentially correct as they may be) which prohibit anything like mechanical ornamentation, and which prescribe that every wreath of foliage, or every graceful arabesque, added as decoration to a building of a certain order, must be the expression of the mind of the artist; must, in fact, be more or less something of a hymn or even of a prayer, crystallised in stone or in pigment, have to be regarded under the control of ordinary common sense. No doubt it would be charming to many of us to use no earthenware but such as bore the flowing touches of the pencil of Raffaello or of some of the masters of the majolica art. But this would, for most of us, simply mean that we had to eat out of wooden trenchers. And the entire advance which has been made in the beauty of the ordinary table service since 1851 has been due, not to the refusal of any ornamentation but such as bears the stamp of the individuality of the artist, but to the improving (under the best artistic direction) of good mechanical procedures, by virtue of which articles of beauty, although cheaply and mechanically produced, may be attained by the million.

On this view of the case, we think that the objection which may be theoretically raised to the use of stencilling or other mechanical means of effecting decoration in a church tends to vanish. Fresco, as the word is understood in Italy, is as yet generally considered to be impossible in England. At all events, we have grim and grizzly failures to which to point. Some say it is the fault of the climate. Some attribute it to a want of the art element in the English character. For our own part, we are inclined to attribute it in the first place to our manipulation of lime, which is the opposite of the Italian mode, and then, secondly, to the consequent absence of the early and instructive training of the workman. It is when material grows ready to his hand that the native genius is duly fed from his cradle. Otherwise he has three chances out of four of being either starved, or converted into a merely mechanical workman. But be this as it may, the fact is that if we were to wait for free hand, or original, bold, and flowing decoration, we should have few buildings that would have any chance of being decorated at all. The very few men whose facile brushes would obey their hands, as do those of comparatively humble workmen in Italy, would not be able to make much impression on the acres of wall that it might be required to decorate. And the free hand work of the untrained workman has more of the grotesque than of any other element, and that by no means a pictorial grotesque.

We come, then, rather in spite of ourselves, to the conclusion that if colour decoration be desirable in any of our churches, the method which has been adopted in the case in question, viz., the use of stencil plates, for giving the outlines of patterns to be filled with colour, is in most cases a practical necessity. And in the present case there are medallions of angels, and figure-scenes in a sort of frieze, which are not altogether mechanical in their production; some of which though quaint, are not without a sort of suggestive beauty of their own.

The main idea of the decorations to which we call attention is that of accentuating the structural lines of the building by strong lines of colour,—not glaring, but laid in with a bold touch. Between the ribs, vertical and horizontal lines simulate, to a certain extent, masonry, viz., they do so in a conventional rather than in a servile manner. The joints of the imaginary stones ramify into foliated luxuriance. Over the east end windows, indeed, a deep red colour has been introduced, with the aim, or at least the effect, of representing ordinary brickwork. This might *per se* be criticised. But the whole progress of the work has been such as to show that a correct opinion can only be formed of it as an *ensemble*. The decorator has evidently felt his way, and the ornament produced one day has sometimes disappeared on another, because it did not accord with something else. Thus a pair of monolithic pillars of clunch, which were almost the most striking feature of the chancel in its original nakedness, had so poor, not to say grubby, an appearance when the scaffolding was removed, and the contrasts with the coloration of the roof become apparent, that the decorator has tinted the stone, and introduced bands with coloured roses, to the improvement, it must be confessed, of the general harmony.

Here, again, theory and practice clash. To paint or colour stone is to sacrifice a true, permanent, and often noble, material to a fictitious, transitory, and inferior mode of finish. That, we think, is a sound canon. But how if the stone, in its natural colour, afford so harsh a contrast to the tinted work as to ruin the harmony of the building? One man will reply "That shows that you are wrong in introducing colour at all." Perhaps that may be true; but that is not the question. Here we have decided on a coloured interior. It seems to follow that we must do violence to the theoretic canon, in face of actual facts, and colour stone, or fail of good effect.

It will be seen that these are not mere academic questions, or imaginary difficulties; but real practical dilemmas which turn up in the course of the execution of a work, and which are not to be solved by the simple application of a theoretic rule, but as to which it can only be said *solvitur ambulando*, and as such, observation from time to time has led us (we confess somewhat unexpectedly) to render justice to the taste of the artists and workmen of Messrs. Clayton & Bell, and to recommend those of our readers who have cases of the kind to settle, to pay a visit of inspection to their work.

And, after all, there is, perhaps, a broader view of the case to be taken than we have yet suggested. What is desired as the chief object of such a work as a fine chancel? Effect,—*ensemble*,—tone. Who, among the hundreds who worship in a church, is careful, or perhaps able, to criticise the details of its structure, let alone its decoration? But who is there, on the other hand, on whom the *ensemble* does not produce an effect? On some, no doubt, the effect produced, even by such a gorgeous and stately interior as that of the Church of the Annunzazione at Genoa, is much the same as that of a rag of red on a turkey-cock, or a scarlet cloak on a bull. But for them, be they right or wrong, we are not now writing. For others, we feel bound to admit, that the effect of the chancel in question, with its graver harmony of colour, as compared with the original nakedness of the greenish grey brickwork of the interior of the church, is a manifest and notable gain. Not the least advantage gained is the manner in which a more than questionable reredos of gilded wood, and windows of which the intention was, no doubt, better than the execution, have been toned down into happy obscurity.

One really excellent piece of workmanship is the choir screen of brown and white marble, which has replaced a somewhat unsightly dwarf stone wall, between the chancel and the nave. This screen is arranged in a series of niches, with stilted semicircular heads, in each of which a slight tracery of white marble is introduced, as if forming the frame-work of windows. Dwarf columns of green porphyry stand before the intermediate piers. The effect of the screen would, we think, have been every way superior if it had been pierced *au jour*. This, however, is a matter of opinion; but there can be no doubt that it is a fine piece of work as it is. Many, of course, will want to know why there should be a screen at all, and we certainly shall not deny their right to the inquiry. It is remarkable that the first effect produced by the erection of this screen was that it seemed to "kill" the pulpit, which is a graceful stone structure, with marble and porphyry dwarf columns, enriched by bas-reliefs, and which (at a due distance, and without criticism of the drawing of the figures) is a beautiful work. It is probable, however, that the extreme polish of the new marble had a temporary effect, which time will tone down. The decorators, moreover, have stained the stone steps since the erection of the screen, another of those bits of practice which one would condemn by anticipation, but which seem justified by effect. Hammered iron gates are in course of execution for the choir screen, in the hands of a local firm, who are sure to maintain some of the old English traditional skill in this excellent kind of workmanship. When that softening touch of time, which seems more rapidly to fall on churches than elsewhere, has passed over the chancel of St. Nicholas, we think it will be generally admired. At all events, we say to all would-be decorators,—Go and look at it.

A LOVER OF COLOUR.

A CHAPTER ON CHIMNEYS.

WITH the exception of the Great Pyramid of Egypt (Cheops) and the spires of the cathedrals of Strasburg and Cologne, the tallest buildings in the world are chimney-stalks. Nevertheless, the interest which many may take in chimneys will most likely rest not on their size, but upon their universality, upon their commonness and usefulness. Every one, be he who he may, with whatever grand historical personages he may be otherwise connected or disconnected, has relations more or less with some chimney-stalk or other.

Chimneys are the nostrils of a house, and we know how necessary to the life of any object is the breath of its nostrils. In Chambers's "Encyclopædia" it is stated that before chimneys assumed their present form these nostrils of the house were placed at the back of the fireplace, not far above the grate; the vent or flue was short, and turned at the top towards the outside of the wall, through which the smoke found its passage in slits made for the purpose. In those Mediæval times, smoke, not of cannon, might every day be observed issuing from the sides of the castle wall. Now the smoke invariably reaches the open air through perforated columns placed upon the top of the walls of the house. So that instead of looking like the nostrils of a building,

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the chimneys seem rather to occupy the place of ears, as on a horse's, zebra's, or lion's head. You can give expression to the look of a house by them as in the case of the heads of these animals by the make of the ears. You can fix the character of a house by the arrangement and regulation of the height of the chimneys as much almost as by the order of the design of its front. For all that, comparatively little attention is paid to this part of the building; up among the chimneys is the last place we look for order or classification, or even for symmetry in a land or street of houses; and when we discover the elegant and symmetrical up there, we are as much surprised as when we find silver spoons in an ashpit. It is curious to observe that while in general it is thought requisite to have the end of all towering and pointed erections, finished ornamentally, the chimney-head should so frequently be left an exception to the rule. The pillar has its capital, the post its cap always,—the topmost concludes with a button; the spire is invariably crowned with a gilded vane or cross; the tower has a cope and pinnacles; the top of the buttress is turned to pomegranate. The chimney-head alone, with rare but honourable exceptions, concludes, even when otherwise elegant in itself, most generally with the old time-battered, weather-streaked, familiar, red tile pot or can.

Most people consider a "chimney hat" or "tile" an ugly thing on a man's head. I consider a brick can an equally ugly thing on the top of a chimney-head. It is especially ugly when the wind blows it over, and it falls, and hits somebody in the street.

Often these tile cans are hanging over to one side, like Willie with his wig agee. Some of them are high, some low; the more reputable are duplex, and have a long lower and short upper part; the less reputable are devoid of the top appanage: they have either lost it in scrimmages, or never possessed it. Sometimes two or three are piled up in a line, and the toppling figure they form seems ever ready for decline and fall. Sometimes you observe one which has been halved by accident, and which presents a broken and jagged edge to the sky. On rare occasions you may happen to come across one which has been honoured by having two or three upper portions shoved over it, like the old clothesman of caricature, with his multiplicity of hats, or the fashionable lady described by Goldsmith:—

> "Skill'd in no other art was she
> But dressing, patching, repartee,
> And, just as humour rose or fell,
> By turns a slattern or a belle.
> 'Tis true she dress'd with modern grace,
> Half-naked at a ball or race;
> But when at home, at board or bed,
> Five greasy nightcaps wrapp'd her head.
> Could so much beauty condescend
> To be a dull domestic friend?"

Sometimes one stands alone like a sentry. More frequently they are found clubbed together on a stack, like a row of the awkward squad, short and tall, lean and fat, high coloured and cadaverous; some in the attitude of attention, others standing at ease, veterans of the smoke and storm in broken rank and file.

It is no doubt the case that there is a class of old-fashioned and homely buildings the chimney-heads of which the old red tile pot suits, and which nothing else would suit so well. Let it remain and hold high holiday on the top of the thatched cottage and the country manse for ever and a day. But for town buildings, and for all mansions that make any attempt at architectural display, the red tile is an anomaly,—not in keeping; and some funnel of a different pattern, if not of different material, should be substituted for it. It is pleasant to observe that earthenware funnels of really elegant form have been introduced in some instances. There are other forms recently introduced which are not so elegant, and little bits of white or cream-coloured cylinders (like elephants' toes) are among the number which I cannot admire.

To what extent, in fine, are the chimney-heads to be treated ornamentally? Should they, in the general design, be made to occupy a conspicuous or only a subordinate place? Are they just to be made passable so as to escape criticism, or are they to be made notable, so that the eye may be attracted to them as an object to rest on? These are questions the architect may put to himself, and which he must answer according to his lights. It will always be safe for him, however, to put some tidy work upon them in preference to running over them in a slovenly way. When there are a number of heads to be placed on one building he should also ask whether they are to be placed at random, to suit convenience merely, or are to assume geometrical positions, and be placed as the points of a mathematical figure,—whether he will have them put up without due respect to the site or height of each other, or will have them arranged in order, say, like the couples in a dance. I have sometimes seen an old chimney placed so awkwardly that it seemed as superfluous as a third ear on the head or a sixth finger on the hand. The chimney-heads on an elegant building should, to use as a paraphrase words intended for another subject, "possess grace and naturalness, delicacy and strength, balance and order; they should combine freshness of conception with perfect accuracy of execution, and be both familiar and sprightly."

"The chimneys of Venice," says an acute observer, "are not the least remarkable part of her architecture, and no two are alike. There are many with a slender stem of, perhaps, a yard in length, and calyx-like top resembling a tulip; others almost precisely like the watch towers on the corners of ancient castle walls; others of strictly Gothic style; and some of Doric design and classical proportions. Occasionally there is one with such a slender stem and overgrown top, loaded with a redundancy of ornament, that it is the very insanity of a chimney. They catch the last rays of the setting sun, and reflect the opal glories of its tints."

The head of the chimney may be said to consist of four part,—the plinth or the base, the stalk or column, the cope or capital, and the funnel or chimney-pot. The inner and concealed parts of the chimney likewise may also be said to consist of four parts,—the fireplace, where the grate stands; the throat, immediately above that; the vent, or smoke-channel, which succeeds in the order of ascent; and the chimney-top, or lum-head, as it is termed in Scotch, which is the conclusion of the whole affair.

With regard to the *enceinte* of chimneys. It is better to have the chimneys of a house placed in the inner or partition walls than in the outer and carcass walls. There are two reasons for this. One is that they vent better. The hotter the sides of a chimney are the stronger the draught up it will be, and the chimney sides are kept hottest when in the inner walls of the house. The other reason is that heat is economised by having the chimneys in the partition walls. When the chimney is in the outer wall, the side towards the street or open air is generally very thin, sometimes not more than 4 in. thick, and a considerable portion of heat passes through this slender side into the open air. After a shower of rain that part of the gable of a house through which the chimney runs dries more rapidly than the other parts; this shows that the heat is coming through the side of the chimney and getting out of the house. When the chimney is situated in an inner wall, the heat radiates from it into the house on both sides.

Now that the practice of young sweeps riding through chimneys is discontinued, and there is no longer any demand for projections and roughness in their interiors to make stirrups for their little feet, the inner lining of chimneys should be smooth throughout. There should, moreover, be no abrupt turns, no knees or sudden bends, and no level reaches, but the smoke-channel should be made as easy, direct, and flowing as possible. The cross section of that channel should never be oblong or oval, for as the smoke inclines to circle in mounting the chimney, opportunity should be given to allow of it rising in this way; the cross section ought, therefore, either to be round, or square, or of some concentric polygonal figure.

It will not, and cannot be denied that many chimneys are defective, and do not fulfil their office as they should. Some smoke more regularly into the house than into the air; others have an occasional down-blast in certain acts of the wind. Some others cannot be made clean by any amount of sweeping, and when these are kitchen chimneys the auld wife's cakes are threatened with a deluge of soot and certain destruction, whenever she puts on the griddle to bake. If there comes a soft or thawing day, especially, the premonitory colliery drops never fail to come down upon the first griddleful, and splatch the cakes with black.

There are chimneys, again, which require fires like furnaces to rouse them up before they will vent at all.

Perhaps some one may remember being shown at night into a spacious but dingy bedroom, where the furniture had a pall-like look, and where, when the final bow was made, and he was left to himself, he saw that there was a new lighted fire in a large grate under a frowning mantlepiece. This fire, which consisted mostly of black coal, was flaring and smoking a deal, but there was little red in it. There was at the same time, he found, a cold draught moving across the room at the rate of fifteen miles an hour. The feeling of the atmosphere was raw and chill, and the visitor became shivery-shakery. The fire seemed to be drawing out the cold damp which always harboured in the corners of the apartment, and the visitor had left a room which was overheated with fire, light, and fumes. He gets into bed as quickly as he can, puts out the auxiliary light, and trusts to the company of the fire for relief. It proves but a false friend, casts a feeble light on the hangings, becomes less, but at last succumbs to that cold draught travelling across the room between the bed, and it flutters and flickers as if uncertain what to do,—flares up, and goes out.

The fact is, that a fire may be drowned out by having too much cold air violently forced upon it. Fire-places which are too large, grates which are too open, have the fault besides of allowing the air to play about everywhere but upon the point where it is wanted; blowers and newspapers held up in front of fireplaces correct this, and direct the air to the points where the fire is lighted.

When complaints are made of chimneys not venting, it should be borne in mind that the smoke goes out from the chimney-top into an uncertain, changeable, and sometimes tempestuous element. Lieut. Maury, in the "Physical Geography of the Sea," says,—"There are many abraiding surfaces, irregularities, &c., which produce a thousand eddies in the main stream of the atmosphere," and also, "Each valley, every mountain range, and local district, may be said to have its own peculiar system of calms, winds, storms, &c."

Count Rumford's assertion that every chimney can be made to vent perfectly, must be taken with some deductions. It is well understood that hills, buildings, and such like large objects, in the neighbourhood of a chimney, are apt to affect its venting. In certain acts of the wind they may direct the air obliquely upon the chimney, and with a dip downward, so that it is blown into the mouth of the chimney, and the smoke is driven back into the vent, like a man forced to eat his own words. Placing a slab above the mouth of the chimney may serve to correct this. Or, where the chimney and a building close to it are the same height, or nearly so, the wind which comes over the building, cutting across its ridge, comes straight and sharp as a razor along the mouth of the chimney, when it is blowing keen, slices away the smoke as it ventures out, and when blowing hard and all compact, it acts like a lid, off and on, and stops the mouth of the chimney. The cure for this, of course, is lengthening the chimney and raising it considerably higher than the adjoining building.

With regard to what is called back smoke, that is, smoke from one chimney getting into an adjacent chimney, and through it into the apartment connected with the first chimney, I am told that the routine is this. When a chimney is going, the draught in it is upward and skyward; but when a chimney is empty the draught is downward and houseward, the heat of the apartment in the last case causing the cold outer air to gravitate down the cold chimney. When there are two chimneys standing side by side, one of which is going, while the other is empty, the smoke from the going chimney is at times, in certain acts of the wind, blown across the mouth of the empty chimney, and being caught by the current of cold air running down that chimney, is carried with it into the apartment with which it is connected. The way to cure this and get rid of back smoke is to seal up the empty chimney. In old and frail houses, where the chimneys are shaken, back smoke may be caused by smoke passing from one chimney to another through rifts and chinks in the party-wall between them. There is no cure for this,—the disease in this case, like Mr. Pecksniff's complaint, is chronic.

It may not be out of place to sum up by stating the three approved methods of curing chimneys which do not vent well, applied by Count Rumford and all smoke-doctors since his

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time. The first is lengthening the chimney at the top, this increases the quantity of heated air in the chimney, and gives more power or head by increasing the difference between the weight of the air per foot, in and outside of it; the second is contracting the chimney at the throat: this increases the speed with which the heated air passes through it, and gives a heightened initial velocity to the smoke when beginning its course up the chimney. The third is when there is a deficiency of air in the apartment to feed the flame and blow up the fire, putting ventilators into the sides of the apartment, or into the windows or doors.

This imperfect chapter will indicate in a small degree how important for comfort the right construction of chimneys is, and how neatly and correctly all these parts should be built from bottom to top. W. Y. B.

FROM EDINBURGH.

IN our last notice regarding the restoration of St. Giles's Cathedral we referred to the circumstance that no plaster had been used in the nave, as had been the case in the choir. Dr. Chambers has intimated his intention of bringing the choir into unison with the nave, by substituting stone where plaster is used, which will impart a thorough and substantial aspect to the whole interior. The only portion of the walls which will then be left plastered will be the Albany Chapel. A beginning has been made with the new west doorway, and Dr. Chambers has stated his wish to erect a chapter-house, to the east of the south transept. These additions will bring into prominence the poor character of the rest of the exterior. Dr. Chambers has done much and paid much for the restoration of the building, and it is to be hoped that some others may follow up the generosity he has displayed, by thoroughly restoring the whole exterior.

Several years ago a Mr. Ross presented a fountain to the city, which has been placed in West Princes-street Gardens. His widow, who died recently, has left a bequest of 1,500*l.* towards the formation of a covered rock garden and fernery in the same garden. Mr. Morham, the city architect, has prepared designs for the proposed erection.

"The drawing shows a series of three dome-shaped buildings, the central and largest of which is 60 ft. in diameter. The smaller ones, connected with the central building by corridors, 32 ft. in length by 25 ft. in width, take the shape of projecting wings of elongated form, the front elevation of each being domed so as to preserve the general character of the design. The width of the wings will be 37 ft., and the height from the level of the garden 30 ft. The central house will be 47 ft. high. The superstructure, built of iron and glass, will have a frontage of 200 ft.; and it is proposed to place it at the foot of the bank at the east end of the northern section of the west garden, the central portion forming an effective termination for the principal walk. The rockery in this part of the house will take the form of a hollow basin or grotto with winding paths, caverns, recesses, and rugged projections studded with ferns and other suitable plants, the rockwork reaching to a height of 15 ft. One advantage of the design is, that it could be carried out in sections as circumstances permitted, if that should be regarded as desirable."

The President of the Royal Scottish Academy (Sir William Fettes Douglas) has inserted in the *Scotsman* a vigorous protest against the erection of a structure of this kind in such a situation. With this protest we heartily concur. The proposed structure is similar to the Winter Garden for which designs were exhibited a good number of years ago, and which we pointed out to be incongruous with the surroundings. No structures of any kind can add to the beauty of the valley, and a structure of glass and iron in the proximity of the Castle rock would be simply abominable. If the building is to be erected the Meadows would be a suitable place for it; but if the terms of the donation are imperative as to site, the gift should be rejected.

The North British Railway Company have erected a new goods-shed to the south-east of the North Bridge, and the company have asked the permission of the town council to bridge over a part of Cranston-street with a view to improving their communication southward. The effect of this would be to lengthen, in a southerly direction, the subway connecting this portion of the city with the Low Calton. The committee of council, it is understood, are favourable to the request of the company being acceded to, subject to certain conditions regarding the lighting, &c., of the portion to be added to the subway. At the same time the opportunity is to be taken of pressing on the notice of the company the desirability of forming a new access to the Waverley Station by constructing a light footbridge from Jeffrey-street to the open platform behind the Post-office. The bridge would be carried across the railway on light iron pillars, and be about 500 ft. in length.

A new hotel is to be erected at the north-west angle of Prince's-street and St. Andrew-street, from designs by Messrs. Macgibbon & Ross. The elevations were so bald and unattractive that the authorities remonstrated against their being carried out on so important a site. Unfortunately there is not power to prevent the erection of a building of bad design æsthetically, if it is satisfactory in other respects.

The *Scotsman* has commented upon some startling revelations as to the way in which several prominent members of the Town Council were bribed by the Edinburgh Tramway Company, and gives a list of the persons bribed, which includes an ex-Lord Provost, who is stated to have received 80*l.*; five bailies, who are said to have received from 69*l.* to 306*l.* each, and five councillors, who, it is alleged, were paid sums varying from 15*l.* to 322*l.* each. Our contemporary says that in modern municipal annals there is no story more shameful than that of the way in which the interests of Edinburgh were disregarded, and the funds of a private company taken by public men in furtherance of what was a game of speculation.

NEW HOSPITALS.

Eastbourne.—On the 5th inst. H.R.H. the Princess Christian laid the foundation-stone of the Princess Alice Memorial Hospital. The late Princess Alice spent a portion of the autumn preceding her much-lamented death in Eastbourne, and, soon after the sad news of her decease was received, a public meeting of the inhabitants of the town was called, and a decision was arrived at, to erect a hospital to her memory on the Upperton Estate. The cost of the building will be about 5,000*l.*, of which more than 3,000*l.* have already been subscribed. The hospital, which will be in what is called "the Queen Anne style" of architecture, will consist of three blocks connected by corridors. On the ground-floor of the central block will be surgery and operating-rooms, the housekeeper's room, hall, kitchen, scullery, porter's room, larder, and pantry. At the rear will be a large yard with the usual offices, and on the first floor of this portion of the building there will be bedrooms for the nurses. The wings on either side will contain respectively the men's and women's wards, the accommodation provided in each being six beds. These wings, which will consist of only the ground-floor, will be capable of extension should necessity arise. The entire length of the building will be 164 ft. and its width 82 ft. It is contemplated that the hospital, the contractor for which is Mr. W. Gregar, of Stratford, will be completed in March next. The architect is Mr. T. W. Cutler, of Queen's-square, Bloomsbury. The site, which is about an acre in extent, was given by Mr. C. Davies Gilbert.

Birmingham.—Operations have been commenced for building a new hospital at the corner of Church-street and Edmund-street, in connexion with the Birmingham and Midland Eye Hospital, the present building in Temple-row being inadequate for the growing requirements of the institution. Mr. W. Robinson, contractor, is carrying out the work, from the designs of Messrs. Payne & Talbot, the architects. The building will be, as regards style, in a modification of "Queen Anne," and it will be executed in dark red brick, with light-coloured stone dressings. In the main features the architects have followed the plan adopted in the Paris hospitals. The principal entrance, which will be very ornate, will be in Church-street, and will lead into a large entrance-hall, and thence into a corridor and staircase-hall. From the corridor a double stone staircase will rise to the top of the building. The whole of the corridors will have fireproof floors, and the wards will be laid with teak. In the basement there will be the wood and coal stores, a room for the preservation of the books, a mortuary, a bath-room, and also a leech-room. The ground-floor will be mainly taken up with the out-patient department, comprising a large waiting-room, 75 ft. by 35 ft., ample for the accommodation of 200 people; a consulting-room, two minor operation-rooms, surgeon's rooms, secretary's room, and dining-room, besides the entrance-hall previously mentioned. On the first floor there will be a suite of day-rooms, including a smoke-room, on one side for the men, and a suite of day-rooms for the women on the other side. Rooms for the house-surgeon and matron will be situated in the central block. The men's sleeping dormitory is located on this floor, and there will also be a ward in the centre that can be devoted to the use of men or women, as the occasion may arise. On the next floor there will be sundry sleeping wards, and also an operating-room well lighted from the north-east. The kitchens, nurses' rooms, and offices will be in the centre of the block at the top of the house, and will be reached by means of two lifts in communication with the stores-receiving room in the basement; while a third lift will communicate with the dispensary for the conveyance of medicines. The building will form three sides of a quadrangle, and will cover 1,080 yards of land. It is estimated that the new hospital will involve an outlay of about 20,000*l.* Beds will be provided in the new building for sixty-five patients instead of forty-four, as in the present institution.

Hope, near Salford.—The new infirmary which has been built at Hope for the accommodation of the sick and infirm poor of the Salford Union is approaching completion, and will be opened in about a month from the present time. The site of the building is about 310 yards in length and 85 yards in width, bounded on the eastern side by an intended street 12 yards in width, and on the southern side by a carriage drive of the same width. The hospital is designed on the pavilion principle, and a continuous corridor 850 ft. long and 10 ft. wide connects the several pavilion blocks with each other and with the administrative block, which latter is placed in the centre so as to be easy of access from the several departments. This corridor is enclosed on the ground-floor level, but on the two upper stories it forms an open gangway for communication between the several blocks. The sides are protected by parapet walls and iron palisading, and in favourable weather will provide a pleasant resort for patients sufficiently convalescent to enjoy the fresh air and a view of the surrounding scenery, which at this point is perhaps in many respects the best to be found in such close proximity to Manchester. All the corridors and gangways are fireproof, the floors being formed of concrete carried on wrought-iron beams and rolled iron joists. Fireproof construction is also adopted in the staircases, which are all of solid Yorkshire stone. In connexion with each of the two double-pavilion blocks, which together will contain 400 patients, an additional staircase of fireproof construction is provided for occasional use as another means of escape in the event of fire or panic. In connexion with these staircases there are spacious open-air balconies on every floor level for the use of the semi-convalescent old men and women patients, for whose use the double wards are intended. The single-pavilion blocks are four in number, each designed to accommodate 100 patients. The eastern or entrance block is appropriated to probationary and other patients of a peculiar type, and is sub-divided on every floor into what are practically separate hospitals. This block, which is approached by a covered carriage-way for the convenient reception of patients in all sorts of weather, provides for eighty patients, and also contains a residence for the head porter and his wife, a register office for the adjacent weighing machine, and store-rooms for the patients' own clothing. In connexion with the wards there are twenty-four capacious day-rooms placed to the south, with separate lavatories and other conveniences. The wards provide an average of 80 superficial feet of floor space and 1,000 cubic feet of air or breathing space for each patient. As there is a considerable proportion of Roman Catholic patients among the paupers of the Salford Union, a separate chapel is provided for them in addition to that provided for the Protestant section of the inmates. The central administrative block provides on the ground-floor level a large hall, which can be used as a winter garden or for recreation purposes, the whole length and breadth of the inner area, and about 45 ft. in height; large kitchen,

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bakery, scullery, general store-room, nurses' dining-room, servants' dining-room, matron's room and a series of store-rooms for her use, storekeeper's residence and other rooms, medical officers' consulting-room and waiting-room, Board-room, cloak-room, and waiting-room, clerk's office, porter's room, dispensary, and drug-store; and in the centre a spacious entrance-hall, surmounted by a clock-tower rising to a height of 100 ft., having a portico in front, approached by a wide flight of steps from the carriage drive. The rooms on the first and second floors of the administrative block are appropriated to the use of the medical officer, assistant medical officer, matron, nurses, servants, and other officials. The laundry department is situated immediately behind the administrative block, and is separated from it by a wide covered way, having a glass roof as a protection to tradesmen and others when delivering goods, and to the laundresses and servants passing between the two departments with linen, &c.

The wards and day-rooms are all warmed by the patent Manchester grates of Mr. E. H. Shorland, which, when in action, keep up a copious supply of warmed fresh air, drawn directly from the outside, and at the same time extract the vitiated or partly vitiated internal atmosphere, to keep up the combustion of the coal fire. Supplementary extraction-shafts are also provided. The architect of the building is Mr. Lawrence Booth, F.R.I.B.A., of King-street, Manchester, under whose supervision it has been erected. The contract for the execution of the work was let to Mr. William Southern, of Salford, whose tender (43,480*l.*) was the lowest of those submitted for the complete building contract.

THE RESTORATION OF MANCHESTER CATHEDRAL.

A MEETING was held on Monday morning in the Manchester Cathedral Library, to hear a report from Mr. Crowther, architect, on the condition of the nave of the cathedral, and to take counsel as to the steps which should be adopted for its restoration. The Bishop of Manchester presided.

Mr. Crowther's report contained the following passages:—

The renovation of the exterior of the church has been in great part accomplished, but little, comparatively, has been done towards the restoration of the interior of the fabric, of which that of the nave is now in progress. Early in the present century the then guardians of the fabric were advised that the whole of the pier arches of the nave and aisles, the great chancel arch, and the superincumbent masonry, including the clearstory, were in so bad a state of dilapidation from the combined effects of time and rough usage as to need extensive reparation, improvement, and strengthening; and the authorities, with the best intentions, entrusted the execution of this important work to the incompetent persons who had reported on it. It will scarcely be believed that the initiative step taken by these Iconoclasts was to cut away the delicately-moulded capitals and bases of the columns and bay-shafts, the traceried spandrels over the arches, and the Tudor-leaf cresting of the string-course surmounting them, and roughly hew all the remaining surfaces of the masonry, including the finely-moulded columns and arches, preparatory to coating the whole with Roman cement. A more recklessly-dangerous piece of spoliation it is impossible to conceive, for, so far from "repairing, improving, and strengthening" the structure, it was materially weakened by the process, in some vital portions of it to a most dangerous extent. For example, on carefully removing the cement coating from the two most westerly bays on the north side, it was found that the springing stones of the arches immediately resting on the columns had been so much cut away as to leave an area of little more than 14 in. square of solid stone to carry the enormous superincumbent load. A careful calculation of the load which was borne by these stones shows that their reduced sectional area was barely sufficient to sustain it, with the fabric in a state of absolute rest and free from any lateral strain. The wonder, therefore, is that during violent storms of wind, such as that of the great tornado of January, 1839, when the pressure of the wind was equal to 50 lb. on the square foot, and the lofty clearstory must of necessity have been oscillating from so enormous a lateral strain, the whole structure of the nave did not collapse. There can be no doubt that the remaining springers have been cut away to the same extent in order to provide for the cement coating. With equally ignorant recklessness the columns themselves, and especially the bases sustaining them, had been mercilessly cut away, and one of the latter, that, viz., of the most easterly column, was patched up with brick. The original architecture of these arcades was of great beauty and delicacy, and the work was so admirably executed and put together that although of unusual lightness it was quite adequate to its static requirements, and to withstand the effects of time. But the gifted architect who designed this noble church so constructed the fabric and its various details that not a cubic foot of stone more than necessary was used in the work, especially in this portion of it. A practised eye will at once detect this feature of the construction on examining the masonry of the columns and arches which have been stripped of the cement coating, and fully appreciate the danger to the fabric occasioned by the reckless cutting away of the stonework in order to form a ground and key for the cement coating. . . . . The chancel arch with its great piers forming the eastern termination of the nave has been, if possible, more grievously mutilated than the lateral arcades, for the masonry of the piers, which contain winding staircases leading to the roof,—has been in parts reduced to a thickness of 3 in. only,—a thickness miserably inadequate to the weight it carries. The arch itself has met with even worse usage. Iron hooks have been driven into the joints of the voussoirs, on the western or nave side, and on these a rim of brickwork was constructed. The spandrels and wall above the brick arch were then lined with wooden studs, lathed and plastered, and the whole of the surfaces covered with panelled tracery of meretricious design, worked in Roman cement. The masonry of the arch and heavy wall above it has been seriously shaken and disruptured by the process of driving in the iron hooks, and the stonework has settled downward in consequence,—depressing the arch about 5 in. or 6 in. from its original contour. There are sufficient remains of the arch mouldings and general design of the whole original composition for the exact restoration of the chancel arch and piers; and, happily, the latter, below the level of the ancient rood loft, have not been coated with cement, and are in a nearly perfect condition. . . . . On removing the external and traceried lining of the tie-beam of the most westerly roof principal, I was much startled to find that the tie-beam was completely worm-eaten through three-fourths of its sectional area, and that it was no longer performing its office as a tie, but was simply suspended *in situ* by the principal rafters above, and the whole weight of the principal itself and of the most westerly bay of the roof was sustained by the mortising of the rafters into the king-post in the centre, and at the ends by the wall-posts and curved struts. . . . . The roof appears to have been extensively repaired shortly before the ceiling was painted, some thirty-five years since, for the purlins are suspended by wrought-iron straps to the principals, and the transverse ribs in like manner to the purlins, from which it would appear that at that time the tenons of the framing were found to be so decayed as to need the help of the straps for their support. The ends of the tie-beams of this principal do not bed directly on the clearstory walls, but on a strong oak corbel piece bedded on the masonry, and projecting about 2 ft. into the nave, and into this corbel piece the head of the wall-posts is framed. I cannot confidently say at present whether or no this is the original construction; but it appears to be so from the circumstance that a portion of the traceried spandrel of the curved strut is worked upon it. . . . So far as I can at present judge, the plain foundation of the principals will chiefly have to be replaced by new timbers on which the ancient castings and enrichments, so far as they are sound, can be fixed as heretofore, and on this assumption, after making sufficient allowance for renewing decayed portions of the latter, I have formed the following estimate:—Estimate of cost of restoring the roof over the nave: No. 7 principals, at 125*l.*, 875*l.*; No. 6 bays, at 150*l.*, 900*l.*; removing the lead and roof timbers, 85*l.*; shoring up and scaffolding, 120*l.*; relaying the lead and gutters, &c., 80*l.*; total, 2,030*l.*

The Dean of Manchester said that the responsibility in this matter rested entirely with the parishioners of Manchester, and with the wardens as their representatives. It was quite erroneous to suppose that the revenues of the Chapter estates could in any way be used for the sustentation of that portion of the fabric which was in the custody of the wardens, and which was the property of the parishioners.

Mr. G. Milner, speaking on behalf of the wardens, said that this restoration had been gradually forced upon them, and the further they went in their examination the clearer it became that immediate action was necessary. He was strongly in favour of a complete examination of the fabric, and a complete restoration.

Mr. Lings (the comptroller), Mr. Thomas Rose, and the Rev. H. Cottam (St. Mary's, Crumpsall) having spoken, the following resolution was moved by Mr. G. Milner, seconded by Mr. J. W. Maclure, and unanimously passed:—

"That this meeting, having heard the report of Mr. Crowther as to the repairs required in that portion of the fabric of the cathedral for the maintenance of which the parishioners of Manchester are liable, is convinced that such repairs are imperatively and immediately needed, but before asking the public for subscriptions request Mr. Crowther to prepare a full report as to its existing condition, and to furnish an estimate of the probable cost of a complete restoration of the same."

ST. JOSEPH'S (R.C.) CHURCH, BRIDGWATER.

THE newly-built Catholic church in Binford-place, Bridgwater, is now completed, and has just been formally opened by the Rev. W. J. H. Clifford, R.C. Bishop of Clifton.

It may be remembered that the newly-built church has been erected at the expense of Mr. Philip Hewett, a native of Langport, who has been residing for several years past at Boulogne, and who expressed his willingness some months ago to Mr. J. Ruscombe Poole, of Bridgwater, to expend a sum of something like 1,200*l.* for the purpose, a donation of 1,000*l.* being given by him at the same time to the funds of the Bridgwater Infirmary.

The new church consists of a sanctuary or chancel, nave, aisle, side chapel, porch, organ-gallery, and sacristy. It is built of brick, with Bath stone dressings, and covered with Bridgewater tiles, from the designs and under the superintendence of the Rev. A. J. C. Scoles, the priest at present in Bridgwater. Early Decorated was the style chosen, which necessitated a simple form of construction, the beauty of which consists in its proportion and general outline. The entrance is through a doorway of solid construction. The nave has three double lancet windows, the chancel having a clearstory. The façade to the river is more imposing, with its three well-proportioned windows, relieved by columns and moulded arches. The wall between the chancel and nave is surmounted by a turret, containing the "sanctus" bell. The end of every gable is surmounted by a boldly-outlined cross. The east end has three windows filled with stained glass to the memory of one of the sons of Mr. York, its doner. In the north aisle a stained-glass window, representing the death of the patron saint (St. Joseph) has been erected by the priest (the Rev. A. J. C. Scoles) in memory of his late father, these stained windows being the workmanship of Messrs. Lavers, Barraud, & Westlake, of London. The altar is of stone, relieved by four marble columns, dividing three handsomely-moulded quatrefoil panels, to be afterwards filled with sculpture, representing the three great sacrifices, namely,—of Melchizedek, the Paschal Lamb, and that of the Cross. Mr. J. Kitch, of Bridgwater, is the builder; Messrs. Bradfield & Sons, of Bridgwater, the masons; and Mr. A. B. Wall, of Cheltenham, has executed the carving and canopies.

NEWCASTLE-UPON-TYNE.

NEWCASTLE races have this year been transferred from the Town Moor to High Gosforth Park. The beautiful estate was acquired some eighteen months ago by a limited liability company, and comprises upwards of 800 acres, together with the mansion-house erected by Mr. Charles Brandling, M.P., about the year 1760. The latter occupies a commanding situation overlooking the new race and steeplechase courses, and consists mainly of a centre building and two wings, in the Classical style of the period of its execution. The new stand has been erected partly in front of the hall, and partly to the east of it. The stand, although continuous, has private subdivisions for club members and for the stewards, but the grand stand occupies by far the largest portion. The whole is 250 ft. long by 47 ft. broad, is capable of accommodating nearly 5,000 people, and consists of a series of terraces or broad steps extending from the surface of the lawn up to the level of the saloon windows, in front of which is a broad balcony. The front rooms on the top floor of the hall have been allotted as private boxes, each having a large balcony forming an upper tier to that portion of the stand in front of the hall. These and a considerable breadth of the lower stand are roofed in, the covering of the front slope being of glass, and the framing of iron and wood, carried upon ornamental metal columns and brackets.

To the east of the grand stand and its inclosure is the second-class inclosure, containing a stand which originally stood on Newcastle Racecourse. This has been removed therefrom and re-erected here in a modified form, so that its steps begin to ascend immediately from the surface of the lawn, in a similar way to the new

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grand stand. It will accommodate upwards of 2,000 people. In this inclosure is telegraph-office for the reception and delivery of messages from and to its *habitués*, or the public outside the inclosures.

The contractor for the grand stand and works in connexion with the mansion-house is Mr. George Waddell, of Edinburgh; for the second-class stand the contractor is Mr. John Irving, of Newcastle; and for the saddling-shed, &c., Messrs. Broomhead & Keswick, of Newcastle, are the contractors. The architects for the whole of the works are Messrs. Sept. Oswald & Son, of Newcastle, and the clerk of works is Mr. James Eadie, of Blaydon.

DOCKS AND HARBOURS.

The Clyde.—At a meeting of the Clyde Navigation Trust on the 4th inst., the Committee on New Works presented their minutes, recommending to the trustees that the entrance of the proposed Graving Dock No. 2, and the sill, be constructed by the trustees' own *employés*, under the direction and supervision of Mr. Deas, the engineer,—the depth on the sill to be 22 ft. 10 in. at high water, being the depth of the present dock, and the dock to be in all respects as commodious as the present dock, in so far as that shall be found to be practicable in carrying out the works. It was further recommended that the engineer be authorised to raise the sides of the present dock to the extent of 2 ft., as proposed by him in his report, and that he proceed with the execution of this work forthwith. The cost of the proposed dock is stated at 100,000*l.* The trustees, in the course of the discussion which arose on the report of the committee, differed in opinion as to whether the site and depth of the proposed dock were adequate to the growing needs of shipping, and on the motion of the Lord Provost, the further consideration of the matter was adjourned, in order that Mr. Bateman or some other eminent engineer might be consulted.

Dover.—The Bill which the Dover Harbour Board are endeavouring to obtain during the present Session of Parliament for the construction of a deep-sea harbour at Dover is very comprehensive in its character. The present Admiralty pier will form the western arm of the harbour, and, according to the plans, it is proposed to lengthen this by extending it eastwards for a distance of 550 ft. The eastward limit of the harbour will be formed by a pier or breakwater running out from under the cliffs beyond the Castle to a distance extending in a southward direction for about 1,000 ft., the space between the two piers being thus about a mile. Both these piers will converge slightly, and, between them, marking off the entire limits of the harbour, will be a large breakwater. This breakwater will begin in the bed of the sea, about 800 ft. from the termination of the eastern arm of the harbour, and extend in a southerly direction for about 1,200 ft., continuing in a south-westerly direction for about 2,100 ft., to within 600 ft. of the western arm. Provision is, therefore, made for two outlets of 600 ft. and 800 ft. respectively. The harbour will thus enclose nearly the whole of the bay, which is sheltered by the cliffs.

Burntisland.—At the monthly meeting of the Burntisland Harbour Commission, held on the 4th inst., the tender submitted by Mr. P. Penney, Burntisland, for an alteration of the West Breakwater point, which will enlarge the entrance to 150 ft., amounting to 1,061*l.* 13s., was accepted. Plans for the further widening and deepening of the entrance channel were submitted, and a report by Messrs. Meek & Son, C.E., Edinburgh, on the matter was submitted, and Mr. Henderson, resident engineer, was instructed to procure tenders for having the work accomplished in accordance with his plans.

Tilbury.—On Saturday last a large number of gentlemen proceeded to Tilbury on the invitation of the chairman and directors of the East and West India Dock Company to witness the cutting of the first turf on the site of the new docks, the construction of which has just been authorised by the Legislature. The East and West India Docks Company's present system comprises the East India, the West India, and the South-west India Docks at Blackwall, but powers have now been obtained for the construction of deep-water docks at Tilbury, opposite Gravesend, designed to accommodate the lines of large steamships engaged in the West India, China, colonial, and American trades. "Avoiding," to quote a semi-official account of the scheme, "the sinuous and shallow reaches of the Thames above Gravesend, towage, and pilotage, and enjoying exemption from the London fogs and the consequent risk and detention, the site selected offers exceptional facilities to shipowners, as vessels of the deepest draught will enter or leave these docks at any hour, thus rendering the port of London independent of tides." The new docks will, it appears, have a depth of 35 ft. below high-water mark of ordinary spring tides, and include 15,000 lineal feet of quay berths, and they will be approached by an open tidal basin having 43 ft. depth of water. Passenger communication between Fenchurch-street Station and the new dock station is to occupy about thirty-five minutes, and there are to be frequent trains; added to which provision is to be made for enabling passengers and their baggage to be landed or embarked direct at any time of tide. Further, there are to be special landing jetties, wharfs, lairage, and abattoirs, affording facilities for the live cattle trade. There will be four dry docks, with a total length of 1,730 ft., two having a minimum width at the floor of 70 ft., the sills being 32 ft. below high-water mark, and two with 60 ft. width at the floor with sills 27 ft. below high-water mark. The larger of the dry docks will also afford an alternative entrance from the basin into the main and branch docks, the necessity being thus avoided of relying solely on a single passage lock. There is to be an improved system of coaling large steamers simultaneously from both sides; a powerful floating derrick and shears having a lifting capacity of 100 tons will be erected; and for all the purposes in view the company have acquired 460 acres of land. The works have been designed by the company's engineer, Mr. Manning; and the contractors, Messrs. Kirk & Randall, of Woolwich, have undertaken to complete their task within two years and a half. The ceremony of cutting the sod was performed by the chairman of the company, Mr. H. H Dobrée, who, in subsequently proposing "The East and West India Docks Company, and success to their new work," after giving a brief sketch of the company's history from its formation in 1795 down to the present time, said that when the new scheme had been fully laid before them the directors had no hesitation in recommending it to the shareholders, its adoption being necessary for their own protection. He added that they now felt sure of its success; that they had gone into the estimates most carefully; that they had ample capital for beginning the work, having 250,000*l.* in hand; and that they had no doubt that they would be able to raise the money required to complete the works thoroughly.

COST OF THE ELECTRIC LIGHT.

MR. ALEXANDER PEEBLES, one of the architect-members of the Court of Common Council, recalls attention to the fact that at a recent meeting of the Commissioners of Sewers, a report of the Streets Committee upon electric lighting, accompanied by an abstract of tenders which they had received for its installation in four districts of this City, was brought up, read, and ordered to be printed and circulated. As some figures there mentioned have been reported in organs of the press, and might be misunderstood, he thinks the subject may be deemed of sufficient importance to publish the following analysis and remarks, based upon the reports referred to. They are now before the public, and he considers himself at liberty to make this communication.

For obvious reasons he omits the names of the firms whose tenders he quotes, which are placed in sequence according to their amount, and so numbered:—

Statement showing the Comparative Cost of Electric and Gas Light (One Year).

District No. 1, comprising Newgate-street, Giltspur-street, Smithfield (south-east and north-east sides), Long-lane, Aldersgate-street (from Barbican to St. Martin's-le-Grand), and St. Martin's-le-Grand. Estimated annual cost of present gas-lighting, about 551*l.*, given by the Engineer to the Commission for each of the four districts. For lighting this district by electricity, eight tenders were received, the three lowest being as follow:—6th, 560*l.*, or nearly 1¾ per cent. more than gas; 7th, 520*l.*, or fully 5 per cent. less than gas; 8th, 498*l.*, or nearly 10 per cent. less than gas.

District No. 2, comprising Threadneedle-street (from front of Royal Exchange to Old Broad-street), Old Broad-street, New Broad-street (from Liverpool-street to London-wall), Liverpool-street (from New Broad-street to Bishopsgate-street), Bishopsgate-street (from Liverpool-street to Cornhill), and Cornhill. Estimated annual cost of present gas-lighting, about 363*l.* For lighting this district by electricity, seven tenders were received, the three lowest being as follow:—5th, 560*l.*, or fully 54 per cent. more than gas; 6th, 410*l.*, or fully 11 per cent. more than gas; 7th, 395*l.*, or fully 9 per cent. more than gas.

District No. 3, comprising Leadenhall-street, Aldgate, Aldgate High-street, Fenchurch-street, and Lombard-street. Estimated annual cost of present gas-lighting, about 341*l.* For lighting this district by electricity, seven tenders were received, the three lowest being as follow:— 5th, 560*l.*, or fully 64 per cent. more than gas; 6th, 390*l.*, or fully 14 per cent. more than gas; 7th, 380*l.*, or fully 11 per cent. more than gas.

District No. 4, comprising Queen-street (between Queen Victoria-street and Cheapside), Cheapside (between King-street and Poultry), King-street, Guildhall-yard, Poultry, Mansion House-street, Royal Exchange (open space in front of), King William-street, Adelaide-place, and London Bridge. —Estimated annual cost of present gas-lighting, about 612*l.*; for lighting this district by electricity, seven tenders were received, the three lowest being as follow:—5th, 720*l.*, or 17½ per cent. more than gas; 6th, 620*l.*, or 1¼ per cent. more than gas; 7th, 590*l.*, or 3½ per cent. less than gas.

Upon adding together the estimated annual cost of the present gas-light in these districts, it amounts to 1,867*l.*, while the four lowest tenders for the electric light amount to 1,863*l.*, but in this comparison gas has had the advantage of all the improvements in its manufacture which have been discovered since its introduction, and it is generally understood the gas companies do not regard street lighting as a source of profit, while electric lighting is, comparatively speaking, in its infancy, and in these tenders street lighting is alone included.

In the sums mentioned at this meeting as the cost of electric lighting for one year was included the cost of installation and the removal of the whole apparatus at the end of the year, together with the restoration of the streets, lamp-posts, and gas system; items which obviously should not be charged to this light while instituting comparisons, although interest upon capital and an allowance for depreciation and tear and wear should be made, and in the following statement I have added ten per cent. per annum for these items; but inasmuch as the cost of installation is unduly increased by the charges for removal of the electric apparatus and the restoration of gas, I imagine these annual charges would include thirteen per cent. or more upon the cost of installation.

Statement showing the Cost of Electric Light, including Interest and Depreciation of Plant for One Year.

No. 1 *District.*—6th, cost of electric light, 560*l.*; add 10 per cent. upon cost of plant = 739*l.*, or fully 34 per cent. more than gas; 7th, cost of electric light, 520*l.*, add 10 per cent. upon cost of plant = 868*l.*, or fully 57 per cent. more than gas; 8th, cost of electric light, 498*l.*, add 10 per cent. upon cost of plant = 837*l.*, or fully 51¾ per cent. more than gas.

No. 2 *District.*—5th, cost of electric light, 560*l.*, add 10 per cent. upon cost of plant = 739*l.*, or fully 103 per cent. more than gas; 6th, cost of electric light, 410*l.*, add 10 per cent. upon cost of plant = 796*l.*, or fully 117 per cent. more than gas; 7th, cost of electric light, 395*l.*, add 10 per cent. upon cost of plant = 775*l.*, or fully 113 per cent. more than gas.

No. 3 *District.*—5th, cost of electric light, 560*l.*, add 10 per cent. upon cost of plant = 751*l.*, or fully 120 per cent. more than gas; 6th, cost of electric light, 390*l.*, add 10 per cent. upon cost of plant = 707*l.*, or fully 107 per cent. more than gas; 7th, cost of electric light, 380*l.*, add 10 per cent. upon cost of plant = 690*l.*, or less than 103*l.* per cent. more than gas.

No. 4 *District.*—5th, cost of electric light, 720*l.*, add 10 per cent. upon cost of plant = 940*l.*, or fully 53 per cent. more than gas; 6th, cost of electric light, 620*l.*, add 10 per cent. upon cost of plant = 918*l.*, or fully 50 per cent. more than gas; 7th, cost, of electric light, 590*l.*, add 10 per cent. upon cost of plant = 880*l.*, or nearly 44 per cent. more than gas.

In considering the relative cost of the two lights, the greatly-increased quantity and superior quality of the electric must be borne in mind.

Fire at a Builder's.—At an early hour on Sunday morning last a fire was discovered on the premises of Messrs. Dodds & Robb, builders, Brunswick-yard, No. 124, City-road. The men left work at twelve o'clock on Saturday, when the place was reported as safe, and at the time of the outbreak, which cannot be accounted for, there was no one in the building. The building where the fire originated consisted of two floors, about 70 ft. by 60 ft., and in the end it was all but burned out, and the roof entirely destroyed. Messrs. Dodds & Robb were insured. The fire extended to several other properties.

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OBITUARY.

Mr. Hablot Knight Browne, an artist more widely known as "Phiz," died at Hove, Brighton, on Saturday last. Born in 1815, at an early age he obtained a reputation for his spirited caricatures and comic sketches, and in 1835 he succeeded Mr. Seymour as the illustrator of "Pickwick." He afterwards illustrated most of the works of Charles Dickens, and contributed graphic illustrations to the novels of Charles Lever, Ainsworth, and to other works.

Mr. Charles Heath Wilson died at Florence on the 3rd inst., in his seventy-third year. He was, for a number of years, head-master in the Glasgow School of Art, and to his exertions the success which attended its earlier years was, to no small extent due. A man of high culture and fine artistic taste, Mr. Wilson took a deep interest in everything having for its object to beautify and adorn the city; in particular, he exerted himself greatly in connexion with the scheme which resulted in the introduction of stained-glass windows into the cathedral.

MONUMENTAL.

WE understand that a memorial in alto-relievo, the work of Mr. J. Forsyth, will shortly be placed in St. Paul's Cathedral to commemorate the officers and men of the 7th Royal Fusiliers who fell in the recent campaigns in which that regiment took a distinguished part. This memorial will form a fitting companion to the one already placed there, by the same sculptor, to the memory of the officers and men of the 57th West Middlesex Regiment, who fell in the Crimea and elsewhere. In accordance with the new arrangements initiated by the present Dean and Chapter, all commemorative works must partake of a sacred character, and we understand that the forthcoming embellishment of this edifice will be illustrative of an episode in the history of David, king of Israel, who, in an encounter with the Philistines (whilst besieged in the cave of Adullam), exclaimed,—"Oh that one would give me drink of the water of the well of Beth-lehem, which is by the gate," as recorded in 2 Sam. xxiii. 15. Underneath the sculpture there will be a smaller panel with a military trophy composed of the badge and other insignia of the regiment. The names of those to be commemorated will be recorded on a brass.

SHOPS FOR THE METROPOLITAN RAILWAY COMPANY.

THE dinner to the workmen employed by Mr. B. N. Smith & Son, Birmingham, was given on Saturday, the 8th inst., at Neasden Works, to commemorate putting on the roofs of the second contract for the new carriage-shops, &c., for the Metropolitan Railway Company. The above contract comprises four buildings, permanent way shop, 325 ft. long, 50 ft. wide, 25 ft. high; builders' workshop, 282 ft. by 50 ft. by 35 ft.; locomotive shops, 260 ft. long by 198 ft. wide, by 35 ft. high; engineer's offices, 100 ft. by 46 ft. by 35 ft. high. The first brick was laid on the 25th of January, 1882. Nearly three millions of bricks have been laid up to the present date. The whole of the work is to be completed by the 31st of October, 1882, and, judging from the progress that has been made, there is reason to believe they will be completed by the time specified. The engineer is Mr. Joseph Tomlinson; the manager, Mr. Henry Charlton, who was also manager for the first contract. The total cost will be about 60,000*l* The bricks were supplied by Mr. H. Odell, Hayes; the ironwork is from Messrs. Stanley Hall & Co., 91, Queen Victoria-street; lime, from Messrs. Greaves, Bull, & Latrin; stone, from the Howley Park Stone Company.

The dinner was held in the new shop, which was tastefully decorated. The men, numbering 170, sat down to a substantial repast. The chair was taken by the Rev. Crane Wharton, vicar of Willesden; the vice-chair by Mr. Side, manager of the Building Department, Metropolitan Railway Company.

The chairman having proposed the firm, Mr. Charlton said the excellent work that had been done was owing to the subordination of the workmen and the general discipline, and he was pleased to tell them the firm had now work on hand of various descriptions to the amount of 100,000*l*. The vicar, in replying for his own health, said he was pleased to be able to tell them a piece of ground had been presented to him by the Metropolitan Railway Company for a new church, and he hoped ere long to be in the midst of them.

PROVINCIAL NEWS.

Tipton.—The gasworks which have been erected by the Tipton Board of Health were opened on the 1st inst. by the chairman of the Board, Mr. Whitehouse. Previous to the ceremony, Mr. Whitehouse and the solicitor to the Board waited on the Mayor of Birmingham and handed his worship a cheque for 34,744*l*. 12s. 6d., being the amount agreed upon as the value of the mains, &c. Mr. Whitehouse and Mr. Waring subsequently returned to the works at Tipton, where a large number of members of the Board and the general public had assembled. Mr. Whitehouse said the Local Board had taken a great responsibility upon themselves in raising the heavy loan of 60,000*l*., to be paid off, principal and interest, in fifty years; but the Tipton people would now make their own gas, instead of being dependent on Birmingham. Wages would be paid now to local workers, the works themselves would add to the rateable value of the parish, and there would be a margin of profit to assist the ratepayers. This profit, he trusted, would be made without any increase in the price of the gas to the consumers. There had been paid over to the Corporation of Birmingham 33,700*l*., in accordance with the award of Sir Henry Hunt, and for additions to the works since then, 1,044*l*. 12s. 7d., making a total of 34,744*l*. 12s. 7d. The Tipton manager was now successfully making gas, and it would be turned on at once. The total cost of the gas undertaking was 67,775*l*. 6s., made up with the above amount with 25,008*l*. 6s. for the outlay on the works, contracts, land, and mines, and 8,022*l*. 6s. 5d. for Parliamentary, law, and other charges. The works are situated half-way between the Dudley Port and Tipton Station on the London and North-western Railway, on land formerly belonging to the Tipton Green Colliery Company, and they were designed by Mr. Thomas Proud, C.E., of Birmingham. Messrs. Howl, Ward, & Howl, of Tipton, excavated the ground and erected the buildings; and the ironwork, engines, &c., were supplied by the Horsley Company. There are eighty-four retorts, with provision for thirty more, and there is power to force 400,000 ft. of gas per day through the pipes. The offices in connexion with the concern are well and strongly built. The meter has been supplied by Messrs. Bent & Son, of Birmingham. The two gasometers are capable of holding 154,000 cubic feet of gas each.

Birmingham.—In readiness for the Triennial Musical Festival which takes place next month, the Town-hall interior is undergoing considerable renovation and improvement. Mr. J. P. Norrington, the building surveyor to the Estates Committee of the Town Council, has been for some time past engaged in superintending not only the cleaning and painting of the hall, but in carrying out a variety of important structural alterations, the need of which had long been felt, and which the present was thought a suitable opportunity for making. The alterations are chiefly in regard to the means of egress and the provisions for ventilation, lighting, and drainage. The staircases to the great gallery have been rearranged, so that a much safer and speedier egress than formerly is afforded to the large numbers of people who on special occasions are accommodated in the great gallery. Beneath the orchestra two large additional doors are now provided opening from the floor into the committee room behind. From the committee room a new exit, in the shape of a fairly spacious passage and doorway, has been opened through the back of the hall, and in front of the Chamberlain Memorial. From this passage an additional staircase to the orchestra will be erected, thus providing for a portion of the hall which has always been most inconvenient of access. At the Ratcliffe-place side of the hall a new staircase will be run up to the orchestra, and on either side of the orchestra the passages and doorways have been materially widened. In the corridors alterations have been effected by the removal of obstructions which tended to impede egress in case of a panic, and in various other parts of the hall care and attention have been devoted to the same purpose of facilitating the emptying the hall in the event of a rush.

MR. GEORGE SOMERS CLARKE, ARCHITECT.

WE mentioned the lamented death of this gentleman in our last only briefly. Mr. Somers Clarke commenced his professional career as a pupil of the late Sir Charles Barry, R.A., under whom he was engaged in preparing many of the drawings for the Houses of Parliament. In 1849, he, with Mr. J. Johnson, F.S.A., illustrated "The New Palace of Westminster," and many other of his drawings were published in various forms.

On leaving Sir C. Barry's office Mr. Clarke spent a considerable length of time on the Continent, going through France, Germany, and Italy. The number of his sketches testifies to the delight he took in his profession; and it is evident that during this tour he laid the foundation of that intimate acquaintance with, and delicate appreciation of, Italian detail which afterwards characterised his works. He also travelled extensively through England, and prepared, amongst a multiplicity of other sketches, a beautiful series of drawings of Northamptonshire churches, which, however, was never published. Amongst his earlier works were:—

Cowley Manor, Gloucestershire, mansion, stables, lodges, &c.; Merchant Seamen's Orphan Asylum and Chapel, Snaresbrook; Brighton Blind Asylum; Swan Downers' Schools, Brighton; Turkish Baths, Jermyn-street (this was the first bath built of any pretensions); Forest Hill Park, Windsor, mansion and stables; Foxbush, near Tunbridge, Kent, residence, lodge, and stables; Mountains, ditto; Manor House, Sidmouth, Devon, residence, lodge, and stables; Mount Felix House, Walton, additions, &c.; Maresfield Rectory; Pinehurst, Box Hill, additions, &c.; Kemnal Wood, Heathwood, and Millfields, Chislehurst, residences and stables; a small clergy-house, Chislehurst; Coffee Tavern, Chislehurst; numerous Queen Anne houses on the Manor Park Estate, Chislehurst, for Mr. W. S. Mahoney; Grange Houses, for Mr. E. B. Ricketts, Chislehurst; residence, stables, and lodge, for Dr. Saunders, Chislehurst; farmhouse at Kensworth, Beds.; he also received the premium for the Midland Railway Hotel, St. Pancras; Milton Hall and Parrock Lodge, Gravesend; The Warren, Hayes, Kent, residence and stables.

Amongst his City works may be mentioned:—The Auction Mart; General Credit Company; Messrs. Munt & Brown's warehouse, Wood-street; eight warehouses, Cripplegate; a large warehouse, corner of New Basinghall-street, for Messrs. McIntyre & Co.; Messrs. Brett's warehouse, High Holborn.

Mr. Clarke restored Dunstable Priory Church, and Houghton Regis Church; and added a new chancel to Trinity Church, Marylebone.

Mr. Clarke was among the architects chosen to compete for the Foreign Office, Law Courts, National Gallery, &c. His largest and principal work was Wyfold Court, Oxon, the seat of the late Mr. E. Hermon, M.P. This work comprised mansion, grange-house, stables, bailiff's house, school, lodges, dog-kennel, cottages, &c.

At the time of his death he was preparing designs for an additional wing to the Law Institution, Chancery-lane, Peplow Hall, and other works.

Mr. Clarke was elected an Associate of the Royal Institute of British Architects in 1845, and a Fellow in 1859, and was at one time an acting member of the Council.

His death was painfully sudden, he being engaged in business within a few hours of his decease. He was held in great esteem by a large circle of both private and professional friends, and especially by the members of his office, to whom he always showed the greatest kindness and consideration.

THE DESIGNS FOR THE MUNICIPAL BUILDINGS, GLASGOW.

A SPECIAL general meeting of the Glasgow Institute of Architects was held on Tuesday, Mr. John Honeyman, F.R.I.B.A., president, in the chair, and there was a good attendance of members.

Mr. William MacLean, the secretary, reported that the Council of the Institute had sent a letter to the Lord Provost proposing that an opportunity should be afforded competitors for the new Municipal Buildings of publicly exhibiting their designs immediately after the final award, and recommending that competitors should be invited by the Town Council Committee to return their drawings, or some of them, this view; and that the Council [illegible] Corporation Galleries for [illegible] and undertake

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such expense as might be incurred. The secretary further reported that the Lord Provost had submitted this letter to the Municipal Buildings Committee of the Town Council, who had declined to carry out the suggestion that the designs should be publicly exhibited; that the Council of the Institute having again considered the matter, resolved that steps should be taken to ascertain whether the competitors, or a majority of them, would wish their drawings to be exhibited. A circular was accordingly being sent to the secretaries of the various architectural societies intimating the refusal of the Town Council, stating that the Institute had resolved to make the necessary arrangements for such an exhibition if a majority of the competitors wish it, and asking the several societies to assist them by bringing before architects the following intimation, viz.:

"The Glasgow Institute of Architects having agreed to undertake the charge of an exhibition of designs submitted in competition for the Glasgow Municipal Buildings if asked to do so by a majority of the competitors, all willing to exhibit their designs, are requested to send intimation to the secretary of the Institute, Mr. William MacLean, writer, 196, St. Vincent-street, Glasgow, on or before Tuesday, the 18th inst."

The President said he had no doubt that the refusal of the Town Council to exhibit the rejected designs along with the one which had been chosen would cause general dissatisfaction, not only among architects, but among all who took any interest in the proposed undertaking. Although the condition bearing upon the point was somewhat obscure, the intention of the promoters no doubt was that there should be no public exhibition of designs until after the final award. Many competitors thought that there ought to have been such an exhibition before the final award. There was considerable diversity of opinion as to this, and there was room for such diversity; but he thought every one would agree that in all important competitions there ought to be an exhibition of the designs after the decision, if not before it. It was only what was due to the competitors, who, of course, had a laudable desire to show what they had achieved,—how nearly they approached success,—what they thought good, or even best, whatever other people might think. It was due also to the public, who were really through their representatives the promoters of this competition, and many of whom took an intelligent interest in it. A competition such as this without an exhibition of all the designs was like a race in which only the winner and none other should be visible. The idea that people were not interested in any but the winning design, or boat, or horse, or anything else, was simply monstrous. He was not a competitor himself, and spoke dispassionately; but he must say that he regretted this refusal exceedingly, and all the more because up to this point the Council had acted in such a way as to merit the highest commendation, and the influence of their example would certainly be beneficial in the conduct of future competitions. In the circumstances their Institute seemed to be called upon to do what the Town Council ought to have done.

On the motion of Mr. Sellars, seconded by Mr. Bromhead, the meeting unanimously approved of the action of the Council of the Institute, and remitted to them to make the necessary arrangements for the proposed exhibition, provided, in their opinion, a sufficient number of the competitors are desirous of exhibiting their designs.

NEW POLICE STATION, LEWES.

THE old Mechanics' Institution and Lecture Hall, West-street, Lewes, with a cottage and builder's yard pertaining, is to be converted into a county police-station; the price given to Mr. Crosskey and Mr. J. Every for the premises and ground is 1,250*l.* for the hall, and 700*l.* for the adjoining parts. The estimated outlay is within 6,000*l.* The accommodation will comprise dormitories for twenty constables, five cells for prisoners, stable, cart-shed, chief constable's apartments, clerk's office, waiting-room, three bed-chambers, superintendent's quarters, living and three bed-rooms, two sergeants' rooms, six bedrooms, constables' two rooms, charge and store-rooms, lavatories, dining-hall, reading-room, and library. The alterations are to be commenced forthwith, and a great portion of the present fabric will be converted to the usage required, under the superintendence of Mr. Henry Card, the county surveyor.

INTERNATIONAL COMPETITION.

THE *Official Gazette* (Bucharest, July 10th) publishes a decree announcing a public competition for plans of the bridges to be built over the Danube connecting the Kustendje-Cernavoda and Bucharest-Fetesti Railways; and also for plans of a tunnel to be constructed under the Danube at about the same spot. The prizes for the plans of the bridges will be of the value of 100,000 francs, and those for the tunnel will be worth 50,000 francs. The cost of the bridges is estimated at about 20,000,000 francs.

The Roumanian Government invites the principal engineers of the world to compete.

THE SWIMMING-BATH AT THE LEYTONSTONE WORKHOUSE.

AT last week's meeting of the West Ham Guardians it was reported that the swimming-bath at the Leytonstone Workhouse was leaking at a costly rate, 2,500 gallons of water having escaped in the short space of thirteen hours, and Mr. Simons, one of the members, said he was afraid that the leakage was affecting the foundations of the house to a very serious and dangerous extent. In the course of a conversation on the matter it transpired that Mr. Angell, the surveyor, had suggested that the interior of the bath should be stripped, and it was proposed and seconded that this course should be adopted, and that the surveyor, under the superintendence of a committee, should carry out the necessary repairs. Some of the Guardians were opposed to the proposal, and it was urged that, as the whole of the work in connexion with the construction of the bath had been executed so recently, and at so great a cost to the ratepayers, the fact of so great a leakage was a reflection on the surveyor and the builder, and that the Guardians ought not to give their consent to the spending of an indefinite sum to repair other people's bad work. The proposal was, however, adopted.

HYDE PARK CORNER.

AT the meeting of the Metropolitan Board of Works on the 7th inst., the following report of the Works and General Purposes Committee was then read:—

In pursuance of the reference by the Board of Friday last, your Committee have had before them the memorial presented on that day by a deputation from the Council of the Royal Institute of British Architects, on the subject of the proposed improvements at Hyde Park Corner. The memorial expresses the opinion of the Council that, while the general idea of the scheme merits public approval, it is defective in two main particulars, namely:—1. That inadequate provision is made for the relief of the public traffic. 2. That the removal of the Wellington Arch is unnecessary. The grounds upon which this opinion is based are set forth in the memorial, with which is presented an alternative plan showing how the two objects desired by the Council could, in their judgment, be accomplished. Your Committee have carefully considered the representations addressed to the Board by the memorialists, and they have had an opportunity of ascertaining the views of the First Commissioner of H.M. Works on the subject. They find that the First Commissioner has already explained to a deputation of the Council who waited upon him that, with respect to the only detail upon which that body appeared to be itself agreed, namely, the widening of Piccadilly from a point further to the eastward than is shown in the official plan, he had already made provision in this direction in his instructions for the working drawings. Your Committee learn also that the First Commissioner pointed out to the deputation the grave objections to their alternative plan which had led him to reject many others of a similar nature when considering how best to deal with the question. The First Commissioner was under the impression that the deputation, or at all events the great majority, were convinced as to the objections to their plan, and he has expressed his surprise at the course which the Council have taken in memorialising the Board on this matter. Your Committee fail to see that any sufficient reason has been shown by the memorialists to induce the Board to suggest a variation in the plan which has been already determined upon, and they recommend that a reply be addressed to the Council to that effect.

Mr. Selway, in moving the adoption of the report, said it would be in the recollection of the Board that last week * a deputation attended from the Institute of British Architects and presented a memorial, which was accompanied by a plan, on this subject. After the deputation had explained their views, it came out that they had previously waited upon the First Commissioner of Works, and, not having received much encouragement there, they came to the Board. There would appear to be no impropriety in the Institute addressing the Board on the question, seeing that the Board had agreed to contribute a very large sum of money in aid of this improvement, but having very carefully considered the proposals of the Institute, the Committee could not recommend the Board to apply to the First Commissioner for any modification of the original plan. It appeared that the Council of the Institute itself was very divided as to the plan which should be submitted to the Board, and the plan presented by the deputation was only the plan of a small portion of the Council.

The recommendation of the Committee was approved.

* See pp. 51, 57, *ante*.

DECISION UNDER THE BUILDING ACT.

ON the 5th instant a case of some importance was heard before Mr. Ellison at the Lambeth Police-court. The point at issue has before been raised, under the Metropolis Building Act, as to what constitutes a building; and in this case additional interest was manifested from the peculiar nature of the structure.

The summons was against Mr. Robert Clark, of 403, Kennington-road, taken out by Mr. Banister Fletcher, the surveyor under the Act for the district, for his having, on the 28th of March, erected, or caused to be erected, in the forecourt of such house, a certain structure without giving two days' notice before such work was commenced. In that notice the defendant was bound, it was alleged, to give the situation, area, height, and intended use of such buildings, &c., according to the terms of the Building Act, 1855, and whereby he had rendered himself liable to a penalty not exceeding 20*l.*

Mr. Burton, from the office of the Metropolitan Board of Works, appeared to prosecute, and pointed out that in this case defendant had erected, or caused to be erected, a certain wooden structure upon the garden in front of his house, which, although on wheels, was contended to be a building within the meaning of the Act. He believed that the contention of the defendant, from what he had heard, would be that as the structure was upon wheels, it would not come within the provisions of the Act. He (Mr. Burton) desired to refer his worship to the case of Stevens *v.* Gorsley, in which Mr. Justice Byles gave a decision; but likewise more particularly to a decision given by Mr. Chance at this Court, on all fours, as it were, with the present case.

Mr. Ellison said the only question really before him was whether a building on wheels, as this was described to be, was a building within the meaning of the Act. He had no doubt there was the same danger arising from such a structure as another differently built; and he had no hesitation whatever in saying this structure was a building within the meaning of the Act, and he should hold such to be the case until his opinion was upset by that of a superior court. Mr. Ellison imposed a fine of 20s. and costs.

The money was paid.

HAMILTON PALACE.

SIR,—Will you allow me to correct a statement regarding Hamilton Palace in the article in your recent issue (p. 4, *ante*) on "London and London's Architects a Century Since," viz., "that Wanstead House seems to have been exactly reproduced (see the illustrated papers) in that palace of the Dukes of Hamilton which even now is giving up its contents to follow in the fatal train to the auction-room."

Wanstead House, as a composition, is a two-story building, with a rusticated basement, and having pavilions of three stories at either end, a centre of corresponding height, with a hexastyle portico, rising from the top of the basement floor, with outside stairs, right and left, leading up to it, the main cornice surmounted by a balustrade and bases.

The new or north front of Hamilton Palace, designed by David Hamilton, and usually the one given in views such as appeared in the *Illustrated London News* of a week or two ago, is a building of equal height throughout, viz., three stories, the portico and stairs leading to it being similar to that at Wanstead; there the resemblance ceases, the proportion and composition of the two fronts being widely different; the one having a broken outline, the other horizontal in character, with a refinement of feeling and quiet dignity immeasurably superior to its so-called antitype. What the architect might have made of it, had he been unfettered and had an entirely new building to design

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cannot now be surmised; but I have no doubt it would have been worthy of his reputation. What he had to do was to put a new front at the back of an old building, which, in plan, forms three sides of a quadrangle,—now the garden front,—with the entrance-door and hall on the ground-floor; whereas he had to place the grand entrance-hall and state-rooms on the second-floor level, those in the old building being on the ground-floor. That it is a marvellous success will, I think, be allowed by every visitor, coupled with a regret that the effect of the new front cannot be fully brought out on account of its bad exposure.

Of the many works executed by Mr. Hamilton, this is the first time I have heard him accused of being a copyist, and I think it but fair to his memory to free him from such a reproach.

AN OLD PUPIL.

Miscellanea.

The Stafford Surveyorship.—At a meeting of the Stafford Town Council on the 4th inst., the General Purposes Committee reported that the surveyor, who had been appointed borough engineer for Blackburn, had written a letter dated the 23rd ult. to the Town Clerk giving notice of his intention to resign his position at the expiration of three months. The committee, while regretting the loss of Mr. M'Callum's services, recommended that his resignation be accepted, and that an advertisement be inserted in certain papers for a successor at a salary of 200*l.* a year, with an annual increase of 10*l.* for five years. The Mayor, in moving the adoption of the report, expressed regret at losing the services of so efficient an officer. Mr. M'Callum had been with them some years, and during that time considerable works of public improvement had been carried out, all of them in a most satisfactory and efficient manner. While they regretted to lose Mr. M'Callum, they offered to him their congratulations on the substantial advance he had obtained, as well as to the town of Blackburn on obtaining the services of so zealous an officer. Alderman F. Marson seconded the adoption of the report, and endorsed the remarks of the Mayor. Mr. Holder moved that the recommendation to advertise for a successor at the salary named be struck out, being of opinion that they could obtain the part-services of a gentleman for half the money. This was seconded by Mr. Follows, but ultimately it was resolved that the appointment of a successor should be considered by the Council in committee.

The Parkes Museum of Hygiene.—We are very glad to hear that the committee, at the meeting of the Council last week, resolved unanimously, on the motion of Dr. Poore and Mr. Berkeley Hill,—"That the Council of the Parkes Museum is of opinion that, pending an appeal to the public for funds to erect and endow a Museum, it will be necessary, and they have decided, to remove the collection of articles at present housed in University College to premises more suited for the purpose of display and instruction. This removal will be carried out with all possible despatch." A building committee has been appointed to inquire and report to the Council as to obtaining a suitable building for the purposes of the Museum on a short lease, with option, if possible, of purchasing the freehold at the end of the term.

The Restoration of Christ Church, Hampstead.—This church has been decorated and improved, Mr. Ewan Christian acting as architect. The east window, portraying the Acts of Faith, as recorded in Heb. xi., the carved oak Communion-table, with its handsome fittings, the gas pendants, and a new porch (yet to be erected) to the south door, have been all liberally presented by friends. The transfer of the organ to the south side of the chancel, the opening out of a north window in the tower, the erection of a new and commodious free aisle, and an improvement in the system of ventilation, are amongst the works which have been effected. We may add that the balance unpaid is now under 100*l.* out of 5,080*l.*, all contributed by the congregation within the twelve months.

Proposed Town-hall, Newport.—An inhabitant writes: "It is reported that one of the least satisfactory plans has been accepted for the new Town-hall, street levels ignored, and the Town Surveyor's opinion set aside."

The Police Orphanage, Twickenham.—On Saturday last the Prince and Princess of Wales visited the Metropolitan and City Police Orphanage at Strawberry-hill, and opened a new wing to the building. The Orphanage stands at a distance of about five minutes' walk from Horace Walpole's villa, on the other side of the railway. The institution provides for the maintenance, education, and start in life of 150 boys and 100 girls. Sir Edmund Henderson, in requesting the Prince to declare the "Prince of Wales Wing" open, mentioned incidentally that the area watched over by the London police had increased so much since the Orphanage was opened, little more than ten years ago, that the new buildings erected in the metropolis would make a street extending from that Orphanage to Abergeldie Castle. The police of the metropolis had increased in numbers from 9,000 to 12,000 of all ranks. After thanking their Royal Highnesses for coming down on that occasion, he asked the Prince of Wales to present a salver, on behalf of the officers of the institution, to Mr. F. H. Caiger, the architect of the new wing, to whom they were very much indebted for his gratuitous services.

Public Servants at Leicester.—Arising out of the recent visit of the Prince of Wales to open the Abbey Park at Leicester, the members of the Decorations Committee on the 7th inst. entertained the Town Clerk and Borough Surveyor to dinner at the Leicestershire Club, and presented each with a testimonial in acknowledgment of their valuable services in promoting the success of the late demonstration of loyalty and public spirit. A number of visitors were present, and in all about forty gentlemen sat down. The Mayor presided, and proposed the usual loyal toasts, which were most loyally honoured, after which Mr. J. H. Millican, in very happy terms, gave the health of the Mayor, and his Worship responded in an able speech. Then the Mayor proposed the health of Mr. Storey (the Town Clerk), and Mr. Gordon (the Borough Surveyor), and presented each with an illuminated address, and a handsomely-bound copy of Thompson's "History of Leicester," similar to the one presented to the Prince of Wales. Both the Town Clerk and Borough Surveyor responded in appropriate speeches.

Liverpool Municipal Archives and Records.—Sir J. A. Picton having, at the request of the Finance and Estate Committee of the City Council, made a careful examination of the Municipal Archives and Records, for the purpose of preparing a catalogue, he has found them so fraught with matters of interest illustrative of the history and progress of the town in its municipal affairs, the growth of its commerce, its manners and customs, &c., a very small portion of which have seen the light, that he thinks it highly desirable that a selection from them should be published, with the necessary annotations. He is willing to undertake the task, without any view to remuneration, provided a sufficient number of subscribers can be secured to defray the expense of paper and print.

The Ship Canal, Manchester.—A meeting of the Provisional Committee for the promotion of the Manchester Tidal Navigation was held at the temporary offices, St. Ann's-square, Manchester, on the 7th inst., when steps in advancement of the undertaking were taken. Messrs. Hamilton Fulton, C.E., of London, and E. Leader Williams, C.E., of Manchester, were appointed engineers, and instructed to make the necessary survey, to prepare a joint report and estimate, and to submit the same to a future meeting with the least possible delay. Mr. Henry Whitworth, of King-street, Manchester, was appointed secretary.

Smoke Abatement Committee.—A meeting will be held at Grosvenor House, for the presentation of awards, and to receive the general report on the Exhibition of Smoke-abatement Appliances at South Kensington, and reports of jurors, on this Friday, July 14th. At this meeting a report will be presented on the general results of the late exhibition, and a programe of operations by which the committee desire to render the work thus begun continuous, progressive, and permanent in its effects.

Granite.—In reply to an inquirer, the red granite pedestal on which stands the Rowland Hill Memorial, recently unv[illegible] from the Dalbeattie qnarries [illegible]rer, Field, & Co.

Serious Gas Explosions in Paris.—A series of terrible gas explosions took place on Wednesday in the Rues du Pont Louis Philippe and François Miron. Forty persons have been injured grievously, and some mortally. At six o'clock in the morning a restaurateur, named Garch, whose house is at the corner of the two streets, was busy decorating the balcony with flags when his wife came to tell him she smelt gas in the cellar. He at once proceeded to warn a gas company's agent, but the office was closed, and the *employés* who should have been there had gone out to see the preparations for the *fêtes*. Garch returned home. An hour later a detonation was heard next door in a barber's shop. The firemen of the Rue de Sevigné were summoned and put out the fire consequent upon the explosion. When they were busy examining the gas-pipes in the cellars of the two houses, news was brought that the gas on the other side of the street was burning. Underground flames darted out of a sewer's mouth. A number of people gathered to look at them. In about twenty minutes after their first appearance a fearful detonation took place. The house opposite Garch's *café* was half blown up, and many other houses were violently shaken. There was an upheaval of the footpath and carriage-way, and paving-stones and splinters of iron were projected like grape-shot.

Official Regulations for the Safety of Theatres in Austria.—A telegram from Vienna says that the Minister of the Interior is about to despatch instructions to all the governors of the provinces to prepare a list of regulations to be submitted to the several Diets in the form of a Bill establishing general official control over all matters connected with the theatres within their jurisdiction in accordance with local requirements. The principal provisions will be as follow:—In every town where there is a theatre a local commission is to be appointed, composed of representatives of the municipal authorities, the police, the medical profession, the fire brigade, and impartial experts. These are to exercise a general supervision. Further, a similar local provision, but comprised of members of the Diet, is to be attached to the Stadtholder's office in each province. All new theatres are to be detached from other buildings, and are to contain no storerooms. Every inflammable substance used in the performances is to be impregnated with fire-resisting fluids, and the most minute precautions are to be taken for insuring proper inspection. It will also be provided that there shall be an open gangway between every six rows of seats, that a shaft for the escape of smoke shall be erected, and that the number of the audience shall be strictly limited to the capacity of the theatre.

Working Men's Club Conversazione.—The South Kensington Museum was on the 7th inst. for the first time the scene of the annual *conversazione* of the Working Men's Club and Institute Union, Sir Thomas Brassey, M.P., who succeeded the late Dean Stanley as president of the Union, having conceived the happy thought of availing himself on this occasion of the resources of the museum as a place of social gathering. The doors having been thrown open at seven o'clock, the members of the various clubs, to the number of about 800, who had accepted the invitation, had time to inspect the treasures of the national collection before the arrival of their host and hostess, the hour announced for the reception by Lady Brassey being 8.30 p.m.

Mr. Sage's Establishment.—A party numbering over eighty of the workmen engaged at Mr. Frederick Sage's works, Gray's Inn-road, dined together at St. Alban's on the 8th. Mr. Sage, who was present, expressed his gratification at the happy relations existing between himself and those about him, and impressed upon them the necessity of doing whatever they were engaged on in the best possible manner, so as to keep up the reputation of the firm.

Artisans' Dwellings.—In the House of Commons, on Monday last, Sir S. Northcote (in the absence of Sir R. Cross), asked the Secretary of State for the Home Department whether the Government would endeavour to secure the passing of a Bill during the present session to carry into effect the general recommendations of the Artisans' Dwellings Select Committee. Mr. Shaw-Lefevre, on behalf of the Home Secretary, replied that it was the intention of the Government to endeavour to pass such a measure in the present session.

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Coming-of-Age Festivities. — Mr. John Fitzherbert Campbell, son of Mr. C. M. Campbell, Mayor of Stoke, head of the firm of Messrs. Minton, and chairman of the North Staffordshire Railway, attained his majority on the 6th inst. The event was one which has created a considerable amount of interest, especially among the workpeople of Messrs. Minton. On Saturday over 2,000 of the workpeople of the firm were conveyed to Rudyard, a picturesque spot about twelve miles from Stoke. They were provided with dinner and tea in a large tent. After dinner, Mr. George Leason, manager of the firm, read an address, and then ten of the oldest workpeople (five males and five females) of the firm presented Mr. J. F. Campbell with a tray, jug, and goblet, executed in hammered silver from the design of Mr. Leo Arnoux, art director at Messrs. Minton's, and specially manufactured by Lambert, of London. The inscription on the goblet is as follows:—"Presented to John Fitzherbert Campbell on attaining his majority on July 6th, 1882, by the *employés* of the firm of Minton's and the Campbell Tile Company, in testimony of their sincere and earnest wishes for his welfare, and respect for Colin Minton Campbell, his father." Accompanying it was an illuminated album, designed by another artist of the firm, Mr. Reuter, containing 1,792 signatures. Mr. J. F. Campbell, suitably acknowledged the presentation, and his father delivered an appropriate address to the workpeople, after which the time was taken up with various amusements.

Decorative Sculptures for St. George's Hall, Liverpool.—The *Liverpool Daily Post*, criticising the thirty-nine designs sent in by competitors, says that many of the 250 drawings and models (now on view in the Walker Art Gallery) "are simply of a farcical character . . . . The majority of them are merely stonecutters' conceptions, of the rule-and-compass pattern, and free from any abstruse originality; others are elegant enough in design of commonplace patterns, and full of trashy and *rococo* symbolism of recent invention, so 'localised' and rendered down to the taste of the day that it would be pitiful if it were not frequently ridiculous; and two or three only of the designs sent in . . . are fit to be regarded as Classic art, or as in any respect worthy of the work of which they are to form a portion." Our own correspondent takes a more flattering view, and says there are amongst them some very good designs, well suited to their purpose. It is earnestly to be desired that a good result will be obtained, the authorities having shown every desire to bring this about.

The Surveyors and Auctioneers' Clerks' Provident Association.—It will interest many of our readers to know that, although no public announcement of the position of the forthcoming rules of this Association has been made, we are assured that the Committee have not slackened, and are still hard at their work. The requirements of the Friendly Societies Acts, under which the rules must be drawn, are so numerous and stringent as to necessitate great care in their compilation. We are able to state that the rates of subscription have been considerably reduced from the figures placed before the last general meeting, and the superannuation scheme available for members over seventy, which has been a considerable difficulty, has every prospect of being carried through.

Samuel Pepys.—An influential committee has been formed for the purpose of obtaining subscriptions towards the erection of an appropriate memorial to Samuel Pepys in the Church of St. Olave, Hart-street. It seems strange that no monument of any kind should exist in the church with which the Diarist was so intimately connected, and where he was buried; and it is thought that many of those who have experienced pleasure in reading the "Diary" will be willing to contribute something in order that the proposal may be carried out satisfactorily. The treasurer is Mr. Owen Roberts, clerk to the Clothworkers' Company; and Mr. Henry B. Wheatley, 6, Minford-gardens, W., is honorary secretary.

A Painted Window and Memorial Brasses, from the studio of Mr. Taylor, of Berners-street, were last week completed in the church at Lower Beeding, off Horsham, the gift of Lady Barttelot, in memory of her parents.

Hove.— St. Andrew's Church, Waterloo-street, Hove, has had a new chancel added from designs of Mr. Charles Barry, architect. Mr. Geo. Lynn is the builder.

New Clock at Burnham.—A new turret clock has been fixed in St. Mary's Church, Burnham, near Rochester, by the well-known firm of J. W. Benson, of Ludgate-hill. It shows the time on four skeleton iron dials, 5 ft. in diameter, with gilt figures and hands, and strikes the hours on a bell of 6 cwt. The frame is of horizontal construction, all the wheels being of brass, and the main wheels 12 in. in diameter with the teeth cut in the same by steam machinery.

TENDERS

For the erection of a block of four and a pair of cottages for the Right Hon. W. H. Smith, M.P., at Great Thurlow, Suffolk. Messrs. Sedgwick, Son, & Weall, Watford, architects. Quantities supplied by Messrs. Nixon & Raven:—

Redding & Son, Cambridge	£1,865 0 0
Bell & Sons, Cambridge	1,799 0 0
Grimwood & Sons, Sudbury (Suffolk)	1,698 0 0
T. Cadge, Hartest	1,669 0 0
Wm. Saint, Cambridge	1,588 0 0
Mason & Son, Haverhill (accepted)	1,579 0 0

For alterations and additions to Swiss Villa, Clarendon-road, Watford, Herts, for Mr. H. Mellard. Messrs. Sedgwick, Son, & Weall, Watford, architects:—

T. Turner, Watford	£1,049 0 0
A. W. Chadwick, Watford	997 0 0
M. Godwin, Watford	975 0 0
G. & J. Waterman, Watford	959 0 0
W. B. Neal, Watford	930 10 0
Clifford & Gough, Watford	921 0 0
Andrews & Sons, Watford (accepted)	889 0 0

For the erection of farm-house and buildings at Hawbush Farm, Great Gaddesden, Herts, for Mr. T. F. Halsey, M.P. Messrs. Sedgwick, Son, & Weall, Watford, architects:—

C. Miskin, St. Alban's	£2,365 0 0
Cook Bros., Berkhamsted	2,100 0 0
T. Turner, Watford	2,100 0 0
W. L. Sear, Hemel Hempstead*	1,998 13 0

* Accepted.

For the erection of a cow-house and granary, at Great Wratting Hall Farm, for the Right Hon. W. H. Smith, M.P. Messrs. Sedgwick, Son, & Weall, Watford, architects:—

Mason & Son, Haverhill (accepted)	£753 0 0

For the erection of a pair of cottages at Easty Lodge Farm, Great Thurlow, Suffolk, for the Right Hon. W. H. Smith, M.P. Messrs. Sedgwick, Son, & Weall, Watford, architects:—

Mason & Son, Haverhill (accepted)	£463 0 0

For the erection of a farm-house and buildings, at Wilkin's Farm, Ruislip, Middlesex, for the trustees of the late Mr. G. E. A. Hilliard. Messrs. Sedgwick, Son, & Weall, Watford, architects:—

F. Larter, Harrow Weald	£2,250 0 0
Andrews & Son, Watford	1,958 0 0
T. Turner, Watford	1,745 0 0
C. Brown, Harefield (accepted)	1,630 0 0

For levelling, forming and laying foundations, kerbing and channeiling, in Gloucester-road and Chapel-grove, in the township of Urmston, for the Barton Rural Sanitary Authority. Quantities by the engineer, Mr. John Price:—

E. Bird, Chorlton	£550 10 0
G. Unsworth, Moss-side	524 6 5
S. Cowburn, Hindley	519 0 0
S. Holt, Newton Heath	497 0 0
J. Randall, Weaste	468 7 10
M. Naylor, Hulme (accepted)	455 9 7

For repairs, &c., at Elm House and Rokesley, Crouch End, for Mr. L. Kelley. Mr. J. Farrer, architect:—

Oldess	£218 10 2
J. Harper	184 0 0
Southcott	173 0 0
J. S. King (accepted)	165 0 0

For alterations and additions to house at Wanstead, for Mr. Mumford. Mr. J. T. Bressey, architect:—

Ashby & Horner (accepted)	£340 0 0

For four cottages, Nightingale-lane, Wanstead, for Mr. Sultan Abbott. Mr. J. T. Bressey, architect:—

W. Mundy (accepted)	£675 0 0

For Trinity Free Church of England, New Malden, Surrey. Mr. T. L. Howard, architect, John-street, Bedford-row:—

		Deduct for Bath Stone.
Oldridge	£2,640	£385 0 0
Turtle & Appleton	2,640	185 0 0
Rice	2,613	140 0 0
Johnson	2,434	214 0 0
Saunders	2,397	250 0 0
Le Gassick & Co.	2,350	160 0 0

For the erection of a new retort-house, coal-store, engine and boiler house, boundary-wall, &c., at the Sevenoaks Gasworks. Mr. A. Penny, C.E.:—

	Buildings, &c.	Roof.	Tiling.
	£. s. d.	£. s. d.	£. s. d.
Howell & Sons	2,400 0 0	.....	130 0 0
Robson	2,367 17 1	356 8 0	134 13 1
Ansell	2,267 0 0	544 0 0	174 0 0
Crockett	2,260 0 0	450 0 0	143 0 0
Lucas & Son	2,250 0 0	640 0 0	122 0 0
Durtnell	2,200 0 0	.....	146 0 0
Hunt	2,165 0 0	200 0 0	142 0 0
Holt	2,150 0 0	465 0 0	125 0 0
Cockey & Son*	.....	290 0 0	128 16 0
Wiltshire†	2,020 0 0	324 0 0	150 0 0
Calland & Son	1,874 0 0	322 10 0	144 0 0

* Accepted.
† Accepted for buildings only.

For the erection of a Wesleyan Chapel, St. George's road, Newington, Hull. Messrs. Botterill, Son, & Bilson, 23, Parliament-street, Hull, architects. Quantities by the architects:—

H. Grassby	£4,078 6 6
Fredk. Beilby	3,683 0 0
Executors of the late Thos. Southern	3,660 3 0
Robt. Habbershaw & Son	3,625 10 0
B. Musgrave, jun.	3,570 0 0
J. T. Skinner	3,460 0 0
E. Sergeant (accepted)	3,427 9 0

For keeper's house, boundary-walling, railing, &c., at the new Cemetery, Ayton-in-Cleveland, for the Burial Board. Mr. John W. Alexander, architect, Stockton-on-Tees. Quantities by Mr. Wm. Lunn:—

Jonas France, Middlesbrough	£1,216 3 11
H. Bulmer, Great Ayton	1,095 13 6
Wm. Pearson, Great Ayton*	1,084 16 3
J. & F. C. Coates, Marton and Nunthorpe†	988 17 8

* Accepted.
† The tender of Messrs. J. & F. C. Coates being the lowest, was originally accepted, but they declined to enter into the contract agreement.

For laying out and planting New Cemetery, Ayton-in Cleveland, for the Burial Board. Mr. John W. Alexander architect. Quantities by Mr. Wm. Lunn:—

Jonas France, Middlesbrough	£144 0 0
C. Hockney, Stokesley	134 4 6
A. Cowe & Crosby, Great Ayton	105 0 0
Wm. Pearson, Great Ayton (accepted)	100 11 8

For alterations, &c., at St. Andrew's tavern, 70, George-street, Baker-street, for Mrs. S. J. Headon. Mr. Wm. West, architect:—

Turtle & Appleton (accepted)	£540 0 0

Gasfitting.
Wm. Winn (accepted).

Pewtering, &c.
W. Helling (accepted).

For alterations, &c., at the Harp Tavern, Russell-street, Covent-garden. Mr. Wm. West, architect:—

Toms	£242 0 0
Wright	235 10 0
Turtle & Appleton	225 0 0
Bennett	205 0 0

Pewtering.
Wm. Paddon, jun. (accepted).

Gasfitting.
J. E. Woodward (accepted).

For alterations, &c., No. 119, High-street, Camden-town, for Messrs. Taylor Bros. Mr. Wm. West, architect:—

Dixon	£369 0 0
Gould & Brand	359 0 0
Turtle & Appleton	337 10 0

For bringing-out two shops, &c., at Norbiton, Surrey. Mr. Wm. West, architect:—

Henley	£376 0 0
Oldridge	295 0 0

For alterations and additions to premises, 519, Kingsland-road, for Mr. Sidney Smith. Mr. Geo. Waymouth, architect, 23, Moorgate-street:—

N. Lidstone	£220 0 0
W. Shurmur (accepted)	143 0 0

For shop-front and other work, at 170, Stoke Newington-road, for Mr. A. W. Webb. Mr. Geo. Waymouth, architect:—

W. H. Lascelles (accepted)	£220 0 0

For shop-front and other work at 40, Amhurst-road, Hackney, for Messrs. Webb & Dashwood. Mr. Geo. Waymouth, architect:—

W. Shurmur (accepted)	£123 0 0

For roads and sewers at Leyton Manor Estate, for Mr. W. Brander. Mr. Geo. Waymouth, surveyor:—

D. Knight	£2,863 0 0
C. Taylor	2,394 18 0
W. Porter	2,298 15 0
Jesse Jackson (accepted)	2,222 0 0

For roads and sewers, for the Plashet House Estate Company, Upton. Mr. Geo. Waymouth, surveyor:—

J. C. Trueman	£3,068 10 0
W. Howard	2,857 0 0
John Jackson	2,689 0 0
Joseph Jackson	2,634 7 0
T. Rowley	2,500 0 0
J. Bloomfield	2,236 16 10
Jesse Jackson	2,222 0 0
W. Porter	2,065 18 9
C. Taylor	2,063 0 0

For making new roads and sewers on the Nightingale Park Estate, Bolingbroke-grove, for Messrs. H. Bragg & T. Ingram. Mr. Charles J. Bentley, Union-court, Old Broad-street, surveyor:—

Thompson	£1,675 0 0
J. Blackmore	1,600 0 0
R. & G. Neal	1,600 0 0
J. Ball	1,349 0 0
R. Mayo	1,183 18 0

For alterations and additions to the Parish Church, Llanglydwen, Carmarthenshire. Mr. E. H. Lingen-Barker, architect:—

Morgan & Lewis, Haverfordwest	£397 15 0
Lloyd & Roberts, Haverfordwest	348 0 0
Balcombe & Price, Pembroke Dock	332 10 0
Evans & Blethyn, Whitland (accepted)	274 0 0

For additional buildings connecting the Winter Garden, Tynemouth, and Skating Rink of the North-East Coast Exhibition of Naval Architecture, Marine Engineering, Fishery, Life-Saving and Coast-Lighting Appliances. Mr. William Glover, 16, Market-street, Newcastle-upon-Tyne, architect:—

Walter Scott (accepted)	£2,045 10 9

For additions and alterations at No. 18, Cornwall-terrace, Regent's Park, for Mr. G. J. Romanes, F.R.S. Mr. Mark H. Judge, architect:—

Andrews (accepted)	£987 9 0

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For new schools at Pontypool, Mon., for the Trevethin School Board. Quantities supplied. Mr. E. A. Lansdowne, architect, Newport, Mon.:—

J. & W. Thomas, Pontypool	£2,494	0	0
J. Linton, Newport	1,819	0	0
J. Chapman, Pontypool	1,775	0	0
Morgan & Evans, Pontypool	1,758	0	0
H. Parfitt, Pontnewydd	1,697	10	0
J. Burgnoyne, Pontypool	1,696	0	0
J. F. Williams	1,690	0	0

For the erection of a new parish-room, &c., at Harrow-green, Leytonstone, Essex. Mr. J. T. Bressey, architect, 70 and 71, Bishopsgate-street Within. Quantities supplied by Mr. F. Lee:—

Perry & Co.	£1,750	0	0
T. Boyce	1,670	0	0
A. Reed	1,633	0	0
W. Larter & Son	1,630	0	0
D. C. Jones & Co.	1,622	0	0
T. Rider & Son	1,588	0	0

For the construction of sewer in Winstanley-road, Battersea:—

B. Lapish	£1,950	0	0
Crockett	1,769	0	0
J. King	1,750	0	0
Turner & Sons	1,465	0	0
J. Mears	1,417	0	0
Davis & Attwood	1,379	0	0
G. Torkington	1,314	0	0
Cook & Co.	1,300	0	0
Richeirs & Mount	1,296	0	0
Bottoms Bros.	1,250	0	0
A. Walker	1,195	0	0

For the construction of sewer in Rosenau-road, Battersea:—

B. Lapish	£900	0	0
Richeirs & Mount	869	0	0
J. Mears	817	0	0
Crockett	805	0	0
Davis & Attwood	753	0	0
A. Walker	710	0	0
Turner & Son	698	0	0
Cook & Co.	640	0	0
J. King	630	0	0
G. Torkington	598	0	0
Bottoms Bros.	596	0	0

For the construction of sewer in Poyntz-road, Battersea:—

J. Mears	£347	0	0
G. & R. Neal	340	0	0
Cook & Co.	320	0	0
G. Torkington	317	0	0
Turner & Sons	307	0	0

For billiard-room and conservatory to house in Kemnal-road, Chislehurst, for Mr. D. Clarkson. Mr. George Lethbridge, architect. Quantities by Mr. C. H. Goode:—

Ashby Bros.	£2,140	0	0
Punnett & Sons	2,125	0	0
Manley	2,066	0	0
Higgs & Hill	2,060	0	0
Lowe	2,020	0	0
Harris & Wardrop (accepted)	1,944	0	0

For additional works at the Gloucester second County Lunatic Asylum. Messrs. John Giles & Gough, architects. Quantities by Mr. C. H. Goode:—

Engine-house, Water-tower, &c.

Drew (accepted)	£3,685	0	0

Pumps and First Portion of Laundry Fittings.

Haden & Son	£2,134	0	0
Berry & Son	2,049	0	0
J. & F. May (accepted)	1,900	0	0

Two Cast-iron Store Tanks and Rising Mains.

Haden & Son	£987	0	0
Berry & Son	877	0	0
Drew	813	0	0
J. & F. May (accepted)	720	0	0

Gas-tank, Boundary-walls, &c.

Drew (accepted)	£826	0	0

Accepted for the erection of a wing to Range Bank Schools, Halifax, as a memorial to the late Rev. Enoch Mellor, A.M., D.D. Messrs. Leeming & Leeming, Northgate-chambers, Halifax, architects. Quantities by the architects:—

Masons' Work.—Fearnley & Firth.
Carpenter and Joiners' Work.—Thos. Tully.
Plasterer and Slaters' Work.—A. S. Blackburn.
Plumber and Glaziers' Work.—Akroyd & Mills.
Heating Apparatus Work.—John Holdsworth.
Painters' Work.—Thos. Carr.

Total accepted Tenders £723 19 0

For painting Graystoke-place Schools, Fetter-lane, for the School Board for London. Mr. E. R. Robson, architect:—

Sergeant	£239	0	0
Davis Bros.	237	0	0
Hobson	229	0	0
Knight & Warden	212	0	0
G. S. Pritchard	179	19	0

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Cox	340	0	0
Wood	313	0	0
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Wall Bros.	£354	0	0
McCormick	348	10	0
Boyce	343	0	0
Grover	334	0	0
Williams & Son	316	0	0
G. S. Pritchard	299	0	0

For repairs to premises after fire at 35, Whitecross-street. Messrs. Joseph & Pearson, architects:—

Lidstone	£1,050	0	0
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G. S. Pritchard	998	0	0

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Borough Surveyor (it is not in our power, notwithstanding our natural politeness, to acknowledge a letter the signature of which cannot be deciphered even to the extent of the initial letters).—J. S. (we cannot return to the discussion in question).—H. S. S. (cancelled, having appeared elsewhere).—E. M. K. (communications sent will receive consideration).—E. H. S.—U. A. S.—O. H.—M. & Co.—H. H. —G. T.—L. & L.—C. H. G.—E. W. C.—J. P. S.—J. P.—J. W. H.—J. L. W.—Le G. & Co.—E. P. S.—W. H. P.—S. Son & W.—S. H. T.—W.—W. W.—J. S. B.—J. F.—R. B. G.—C. & W.—T. W. C.—J. W. B. —W. G.—W. W.—J. C. T.—H. P.—C. J. B.—E. H. L. B.—G. W.

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The Builder.

VOL. XLIII. No. 2259. SATURDAY, JULY 22, 1882.

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The Public Offices Site Bill in the House of Lords.

THE ill-advised scheme for the location of the proposed new War Office and Admiralty has passed through Committee in the House of Lords; at least, the Lords have so far committed themselves to the support of a Bill for the purchase of the land required, which is a preliminary but very important step. Lord Sudeley, who moved the second reading, repeated the arguments in favour of the scheme the objections to which we have already referred to in our impression of the 8th of this month (see p. 38, *ante*). Our main and leading criticism, however, was directed to the standing absurdity in connexion with the management of these matters in England, whereby changes in connexion with architecture and with public convenience, which have in their nature nothing whatever to do with politics, are dragged in the wake of political changes, and a project which has been planned and partly initiated by one First Commissioner of Works is abandoned, and the money and time spent over it are utterly wasted, because with a new Government another First Commissioner has come into office who has his own schemes, and is bent upon distinguishing his reign by carrying them out. This state of things is, however, the one reason why there may be some use, even at this stage in the proceedings, in returning to the charge. The present First Commissioner has absolutely ignored the previous intentions of one of his predecessors in regard to the Great George-street site, and the fact that a very large sum of money has been expended in acquiring property in order to carry it out; and therefore it is perfectly possible that the same thing may happen again, and that if there should be a change of Government before the first stone of the proposed offices has been laid, another First Commissioner may in turn annul the present decision, and throw over the money which will have been paid for the new site, in order to return to the Great George-street site. There would be nothing to regret, even on economical grounds, in such a second change, as the money paid for that property is already gone. If the present officials obtain their grant and buy the site now proposed, even then it will still remain merely a question which of the two votes of money shall be wasted; and the question for common-sense people will then be, which site will be the best architecturally.

On this point, as all our readers who have followed us in our previous criticisms on the subject are aware, we have never entertained any doubt whatever; and although we regret to observe that the House of Lords, as a body, have voted in favour of a plan the result of which will certainly be unsatisfactory, we are, at all events, glad to see that the scheme has not been without decisive opposition in their lordships' house, and that some members of the Upper House understand the architectural view of the matter very clearly. It is always more interesting to follow a debate on this class of subject in the House of Lords than in the representative chamber. In the latter assembly the almost ostentatious indifference to what are sometimes contemptuously referred to as "mere questions of taste," the determination to look at everything of the kind from a merely economical point of view, is most irritating to those who think the beautifying of outer life is really worth something; and the tone habitually taken on such subjects speaks very ill for the average culture of the House of Commons. As an example of this, when the model for the Hyde Park Corner scheme was exhibited at the House, we met with members of that honourable body, some of them men who would have claimed to belong to the rather more cultured section of the House, who were perfectly unaware that there was any absurdity in deliberately setting up the Wellington statue on the arch again, who did not know that any objection had ever been made to it, who even thought that the arch would be nothing without the statue. In the House of Lords there is generally evidence, when such questions come up for discussion, of better knowledge on the part of at least a fair proportion of the speakers, and that is something to be thankful for, at all events.

The debate we are referring to was not without illustration on this point. Lord Stratheden and Campbell, in moving that the Bill be read a second time that day six months, pointed out not only the obvious unfitness of the site for producing any architectural effect commensurate with the importance of the buildings and with the proposed expenditure, but also urged, with great propriety, that there was absolutely nothing before them to give any idea as to the plan which it was proposed to carry out in the new buildings, or as to the manner in which it was proposed to treat them architecturally. In some cases such a question might, no doubt, be regarded as premature. Where a site is obviously and admittedly the best or the only one for the purpose, and where it is an open and unencumbered one with which the future architect of the buildings can do much as he pleases, it may be perfectly reasonable to vote the purchase of the site before giving any special consideration to the plan and design of the building, and to leave that for more deliberate consideration afterwards. But the present case does not come under that category. It is proposed to vote money for the purchase of a site very peculiarly situated, hemmed in by other buildings, and coming close up to an interesting building which is one of the historic structures of that part of London, for the Horse Guards is sufficiently old to be called so, and is certainly a building interesting in more than one way. There are two things that ought to be made clear before this site is purchased; first, whether there is really room on it for the convenient provision for the wants of the two public departments concerned, which is a matter of plan; secondly, what kind of building it is proposed to erect here, what is to be its effect when half crowded out from the main street by the two banking buildings which are to remain standing in front of it, and what will be its effect on the general aspect of the Horse Guards and the stretch of buildings of which that structure forms the centre. The supporters of the scheme inform us that the new building will not injure the effect of the Horse Guards building. We know very well that it cannot but do so. That portion of the buildings adjoining St. James's Park of which the Horse Guards is the centre will assume quite a different aspect when a very tall and probably ornate new building is piled up at one side of the site. The Horse Guards will be at once dwarfed and reduced to insignificance, and a very picturesque incident of London architecture will be spoiled. This would not be an argument to use if there were no other site, of course. But under the circumstances it is not without its weight. Another site has been partly paid for where there would be nothing to get rid of except buildings that no one need regret (for the interesting and valuable houses between Delahay-street and the Park were to be exempted, if we remember right, from demolition), where there would be ample space for a complete plan and for an architectural design which could be treated as a great whole, unencumbered by other buildings in front of it, and which would, at the same time, constitute a great improvement in the architectural surroundings and approaches of the Houses of Parliament. This site is to be thrown away for one on which there is no chance of a fine architectural effect, on which it is doubtful whether there is sufficient space for the purpose, and by the adoption of which a very interesting and picturesque corner of London will be unnecessarily spoiled. Added to these objections, there is this further one, that whereas by the adoption of the Parliament-street site an important public improvement in the widening of the

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lower end of Parliament-street would have been simultaneously effected, on the other hand, by the adoption of the scheme now proposed, a very important improvement, long wanted, that of carrying the carriage-way of the Mall through to Charing-cross, will be permanently rendered impracticable. We are aware that this objection has already been made, and has been officially answered to the effect that there is nothing in the scheme to prevent this continuation of the Mall into Charing-cross being carried out also. This reply the First Commissioner has gravely made in the face of the fact that in his plan the line which such a continuation of the Mall would take is blocked by the residential buildings intended in connexion with the Admiralty and War Offices. As we cannot suppose that the First Commissioner would intentionally contradict himself, and say one thing on paper and another thing in debate, we are left only to the conclusion that he had forgotten the effect of the plans drawn in his own department and presumably under his own suggestion.

Besides the opposition of Lord Stratheden and Campbell, Lord Lamington opposed the Bill, implying a question whether the supposed economical character of the scheme, which was its only pretended recommendation, was not more imaginary than real, and expressing a decided opinion that the plan proposed would deface the public park, besides leaving Parliament-street "in its present unsightly condition," which the carrying out of the Great George-street scheme would have necessarily and naturally ameliorated without extra expense. The Duke of Somerset asked the very practical question how far the present public traffic through the Park would be checked by the closing of some of the passages now in public use. The Earl of Carnarvon thought their lordships should have been supplied with fuller information as to the details of the scheme, and objected, and rightly, to the quadrangle system, unless the quadrangles could be much larger than those proposed in the necessarily limited space. The Earl of Redesdale spoke strongly in favour of the Parliament-street site (which we have previously referred to as the Great George-street site), insisting that the object ought to have been to improve the town at the same time that they provided better accommodation for the public offices, and he believed they could make no greater improvement to the town than by taking the Parliament-street site for these buildings. There was certainly enough in these criticisms to show that there is a considerable feeling in the House of Lords adverse to the scheme, and that some important members of that body are quite aware of the practical and architectural drawbacks to it; and if it is the case, as Lord Northbrook observed, that it had been passed without a single dissentient voice by the House of Commons, that only shows the truth of what we have already observed, that the members of the Lower House are, as a body, very indifferent and very ill-informed on subjects of this class.

There will be no end, however, of mismanagement and waste of money, time, and property, in matters of this kind, until their control is made independent of party government and politics, and put into the hands of a permanent official selected for his competency and acquirements for dealing with the laying out of public buildings and sites. At present a First Commissioner of Works is like the *nouveau riche* of the Latin satirist,—

"Diruit, ædificat, mutat quadrata rotundis."

He is ambitious to do something to distinguish his own term of office, and to have schemes of his own and carry them out, if possible, even if it be at the cost both of architectural propriety and of money and time previously expended in initiating other projects. As long as this state of things lasts, this changing the control of public works with every change of Government, we shall see this kind of mischief done. Until a better system of Government in these matters is introduced, the best thing for us is to have First Commissioners with as little zeal as possible, and willing quietly to go on, in the best manner available, with the schemes initiated by their predecessors. The present holder of the office appears to labour under a dangerous amount of ill-directed zeal; and if things go on in this way, there is no knowing what costly mistakes may not be made before another turn of the political wheel brings in another amateur architect to pull the metropolis about as he pleases.

AS TO THE DURABILITY OF BUILDING STONES.

WHILE fully aware of the general attention that has in all times been directed to the durability of stone, we yet question whether the subject has been anywhere exhaustively treated, either in our own country or on the Continent. Although holding closely to the need of experience, we yet should not forget that both chemical analysis and other methods of scientific investigation have made great strides of late, and that it may become essential to the architect to inquire how far they may throw light on the question of durability. We may practically know the difference in the durability of Bramley Fall and of Portland stone, but if we know not only the fact, but its cause, we have made a step in advance. This consideration will have more weight from some observations to which we shall have to refer as to the durability of granite.

For a contribution of much value to this investigation we are indebted to the Director-General of the Geological Surveys of the United Kingdom, Dr. Archibald Geikie, F.R.S. It is from the note-books of geological rambles, and as regarded from the stand-point of the geologist, that the observations to which we have to refer have been extracted. None the less, it strikes us, do they form a very valuable beginning. Our own experience, and we doubt not that of many a reader, is enough at once to contribute some examples to those which have been elaborately investigated by Dr. Geikie; and we look forward with confidence to the preparation, sooner or later, of a comprehensive scientific work on the durability of building materials, in which chemical and lithological science shall have their due parts, side by side with the verdict of experience.

Dr. Geikie's researches have, in the first instance, been directed to the older burial-grounds in Edinburgh; the reason, of course, being, that as tombstones are usually date-bearing monuments, the means of comparing the progress of decay and the lapse of time are unusually precise. To these humble slabs we take leave to add, especially for the benefit of architectural travellers on the Continent, the category of scutcheons and armorial bearings. Many ancient buildings, especially in Italy, are adorned with stone armorial bearings. Of these the herald will be in many cases able to indicate the date with considerable accuracy. And, speaking now only from memory, we should say that a study of lithological degradation in Italy, based on dated works of this kind, will give results so widely different from those obtained by Dr. Geikie in Edinburgh as to point to the primary canon,—that the first division of any study of the subject must be topographical, or, rather, climatological.

Dr. Geikie points out that the effect of weather in a town is likely to be in some measure different from that which is normal in nature. The disengagement of sulphuric acid from the reek and smoke of chimneys is one of the causes of the more rapid decay of stonework in urban, as compared with rural, localities. On the other hand, the range of temperature is likely to be less active in a town. And the incrustation of the surface of the stone with dust, smoke, and other inorganic as well as organic matter, in town buildings, has to be borne in mind, although there may be a question as to the action of such incrustation on the interior substance of the stone.

Around Edinburgh the materials used are of three kinds,—1st, calcareous, including marbles and limestones; 2nd, sandstones and flagstones; 3rd, granites.

With few exceptions, the calcareous limestones in the Edinburgh churchyards are constructed of ordinary white saccharoid Italian marble. There may also be observed a pink Italian shell marble, and a finely fossiliferous limestone, containing *foraminifera* and fragments of shells.

The marble occasionally is employed as a monolith, in the shape of an urn, vase, or the like; but it has been usually fixed in a framework of sandstone. And it is as to its behaviour in the latter case that the observations we have to mention will prove to be novel to most of our readers. Dr. Geikie has, in the first instance, subjected specimens of the marble, both when freshly cut and when long exposed to the weather, to microscopic examination. His view of the process of degradation is that it is of a threefold character. The process of weathering, he says, in the case of this white marble, presents three phases, sometimes to be observed on the same slab, viz.,—superficial solution, internal disintegration, and curvature with fracture.

With superficial solution we are tolerably familiar. It becomes apparent in the gradual dimness that comes over the polished surface of the marble. This is effected by erosion, partly by the carbonic acid, and partly by the sulphuric acid contained in the atmosphere, and notably in the rain that falls in towns. The rapidity of the process in Edinburgh depends very much upon aspect and exposure to rain. Exposure for not more than a year or two to the prevalent westerly rains is enough to remove the external polish, and to give the surface a rough character. The granules of pure calcite, which have been cut across or bruised in the cutting and polishing process, are first loosened or dissolved, and then drop out of the stone. An obelisk erected in 1864, in Grey Friars churchyard, is cited as an example in which the surface has already become so rough and granular that it might be taken for sandstone. The grains are so loosened that a slight movement of the finger will rub them off. The internal structure of the marble begins to reveal itself. The harder knots and nuclei of calcite project above the surrounding surface, and irregular channels, from which the lime has been carried away in solution by the rain, resemble the bleached and furrowed aspect of the rocks on the side of a mountain.

Solution, or decay of some kind, seems rather to be hidden than prevented by the formation of a surface-crust. This Dr. Geikie considers to form most rapidly where solution is most feeble in its apparent action. Beneath it the stone turns to a loose crumbling sand. In time the crust cracks into a polygonal network, and rises in blisters, exposing the under material to rapid disintegration. A marble urn erected in the same churchyard in the year 1792 is thus crumbling into sand, although it faces the east. The process, which Dr. Geikie describes with elaborate minuteness, must closely resemble that which may be observed to take place with oolite stone in London; as, for example, on the south face of St. Paul's, where thick cakes of a black colour may at times be seen to shell off, leaving partially disintegrated stone exposed to view.

It is the third form of decay, which Dr. Geikie describes as curvature and fracture, as to which, we think, the observations now recorded are the most novel. This most remarkable phase is to be observed in slabs of marble which have been firmly inserted into a solid framework of sandstone, and placed either in an erect or a horizontal position. It appears as a swelling-up of the centre of the slab, which forms, as it were, a blister that finally ruptures. A case is cited of a slab, 30 in. by 22 in., and ¾ in. thick, built into the south wall of Greyfriars Churchyard. The date of the last inscription on it is 1838, at which time it is presumed that the slab was smooth and upright. It has now escaped from its fastenings on either side, though still held firmly at top and bottom, and projects from the work like a well-filled sail, to the distance of 2½ in. A series of rents, one of which is one-tenth of an inch in width, has appeared along the crest of the fold. In another case, that of a tomb erected in 1799, facing south, and protected by overhanging masonry from the weather, the inscription has become partly illegible, the stone has bulged out in the centre, and cracks begin to riddle the blister. On another slab, twenty years older, dated in 1779, on the west wall, the process of destruction has advanced to a further stage, and, since it was sketched by the author of these notes, has altogether fallen out and disappeared.

It is the opinion of Dr. Geikie that this mode of destruction is due to the action of frost. As to this we are disposed fully to agree with him, and that from observations of our own which bear on the subject. One set of these regard the durability of marble where frost is unknown, or rare. For example, we can cite a large marble tablet built into the wall by the eastern gate of the little archiepiscopal city of Sorrento, which contains (or did some years ago) a long and perfectly legible Latin inscription, of the date of the Spanish rule in Naples. Again, on the gates of the City of Naples, and on the Castel Nuovo in that city, are scutcheons of arms which have been defaced on some occasion of change of dynasty, and on which the marks

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of the chisel are so fresh that it is clear that the absence of armorial bearings is not due to the lapse of time, but to political causes and purposed violence. In these instances, to which a very moderate acquaintance with Southern Europe can no doubt add many more, we have ample proof of the monumental durability of marble, although freely exposed, in a climate where frost is very rare, and never of sufficient intensity to get good hold of the surface of the ground. The other observations refer to the curious permeability of limestone to wet. It may be said, perhaps, that the water which collects on the interior surface of a limestone or marble wall does not percolate, but is condensed by the cold of the wall from the atmosphere. Weeping through solid stone seems, indeed, incredible. But we can cite one instance of a wall made of mountain limestone, thoroughly well built, and 3 ft. thick, in H.M. Dockyard, Pembroke. It is the wall of a smithy. When it was newly built, when the rain drifted on it from the west the wet ran down within the building as if the walls had been of chalk, or some porous substance. We do not assert that the wet did come through the walls. But it appeared so to do. And, at all events, this and other experiences point to a hygrometric condition in the purest and densest limestones which is likely to have a very destructive effect in the event of the occurrence of frost directly after rain.

Dr. Geikie comes to the conclusion that the lowering of the surface of marble by superficial solution may amount to ½ in. in a century; a reduction to a pulverulent condition in about forty years; and a total disruption by curvature and fracture in a century. We only add the condition that this must be where frost is energetic in its action.

The endurance of sand-stones and flag-stones is a question of selection. In those which consist almost wholly of silica, the durability is very great. Some of these stones contain as much as 98 per cent. of silica. A tomb of this material is cited which was erected in 1646, and ordered by the Scottish Parliament to be defaced in 1662. The original chisel-marks are still fresh on the surface of the stone (as in the case of the scutcheons at Naples), on which the lapse of 200 years has produced little effect, except that of somewhat roughening the exposed faces on the west and north sides.

In cases, however, of striated or coloured sandstones, destruction goes on by solution of the cement or matrix in which the particles of silica are embedded. The most common kinds of matrix are clay, carbonates of lime and of iron, and the hydrous and anhydrous peroxides of iron. In one case of a stone of this kind an inscription, cut in 1863, is no longer legible. We should like to know the depth to which the letters were originally cut; ½ in. at least has been removed from the stone in sixteen years, which is at the rate of nearly ¾ in. in a century.

The well-known propriety of the rule for setting stone on its natural bed is illustrated by the degradation of laminated flagstones when set on edge. Dr. Geikie cites an instance in the case of stones thus treated of the loss of ½ in. in thickness in forty years, which rather exceeds ¾ in. in a century. A curious instance is also given of pillars of a concretionary sandstone, which exposure to the air for 150 years has hollowed out into positive troughs, with hollows from 4 in. to 6 in deep, and from 6 in. to 8 in. broad.

As to granite, we are referred to the experiments of Professor Pfaff, of Erlingen, described in the *Allgemeine Geologie als exacte Wissenschaft*, p. 317, on granite, syenite, Solenhofen limestone, and bone. From the limestone the Professor found the loss to amount to the removal of a uniform layer of 0·04 millimètre in three years, which gives 0.52 in. in a century. The annual loss of granite he estimated as 0·0076 millimètre per year from unpolished, and 0·0085 millimètre per year from polished surface. This difference of more than 10 per cent. against the latter is contrary to what would have been expected; and it has to be asked for what period of time the more rapid weathering is supposed to continue. The slower rate amounts to 0·30 in. per century. Granite has been employed monumentally in Edinburgh for too short a time to allow of the measurement of its rate of decay there. But in connexion with the subject we may be allowed to recall remarks made in the columns of the *Builder* nearly twenty years ago on the subject of the rough and granulated surface of the granite on the west face of Waterloo Bridge. The arches and exterior face of that bridge are built of Cornish granite, from the vicinity of Penryn, and the balustrade is made of fine grey Aberdeen granite. A careful and exact admeasurement of the projections of this bridge, compared with the original dimensions, would enable the student to arrive at a correct estimate of the rate of weathering of these two kinds of granite in London. The bridge was opened in June, 1817.

The close of this interesting specimen of the "Geological Sketches" of Dr. Geikie refers to the fact that in the towns and villages in the north-east of Scotland, where the population is sparse, and where comparatively little smoke passes into the air, the marble tablets last longer than they do in Edinburgh, but still show everywhere indications of decay. They suffer chiefly from superficial erosion, but cases may be observed of curvature and fracture.

In contrast to the perishable character here ascribed to granite, to marble, and to any but the purest silicious sandstone, is the durability of the humble material, clay slate. This is employed for monumental purposes in Aberdeenshire. It contains cubes of pyrites, which might have been anticipated to prove sources of destructive chemical action, but which seem to be inert. The stone is easily dressed in thin smooth slabs. A tombstone of this material erected in the old burying-ground at Peterhead, between 1785 and 1790, retains its lettering as sharp and smooth as if only recently incised. The stone is soft enough to be easily cut with a knife. The cubes of pyrites are covered with a thin film of brown hydrous peroxide. The slate is slightly stained yellow round each cube, but its general smooth surface is not affected. While neighbouring marble tablets, 100 to 150 years old, present rough granular surfaces and half-effaced inscriptions, the lapse of nearly a century has produced scarcely any appreciable change upon the clay slate.

The durability of this material, when prepared by nature for the stone-cutter, may be compared with that of the even humbler, but equally durable, substance of artificially baked clay. In the dry and frostless air of Egypt, marble and granite are almost perennial in their duration. But the main revelation of the forgotten history of the past is derived from the baked clay inscriptions of Assyria. The inertness of this substance, its hygrometric resistance, and feeble chemical affinity with any element with which it comes in contact, is the cause of its indifference to the passage of time, or rather to the recurrence of those changes of temperature and of moisture which accompany the revolution of the year. If the value of clay slate, as a material for monumental inscriptions, had been better and larger known, how much would our churches and churchyards tell, which is now wholly unrecorded?

The chief cause of the interest which we took, from the first hint of this publication that reached us by chance, in these researches of Dr. Geikie, was the hope that they would throw some definite light on what we regard as the most difficult, and one of the most interesting questions relating to any monuments in Europe, viz., the age of Avebury and of Stonehenge. Nor are the remarks without direct bearing on that subject. The stone known as "Sarsen" fulfils the requirements above shown to be conducive to the most permanent durability. It is compact, uniform, close-grained silex. We cannot cite any chemical analysis of the stone. But we do know that the Wiltshire farmers have found it so indestructible by the usual instruments of agricultural violence, that they had recourse to the barbarous plan of roasting these priceless monoliths, — heaping faggots on them to make a bonfire, and then throwing on cold water to crack the stones! This argues wonderful resisting power in the "Sarsen," and no one can be familiar with the stone in question without seeing that it affords the least possible advantage to the tooth of Time. Time indeed, as Dr. Geikie observes, is not an agent, except indirectly, in the matter. Mere duration from day to day has little or nothing in it that is destructive, as we see in Egypt. It is because the revolution of the year, and the succession of the seasons, expose a monument to the successive and ever-repeated attacks of rain, of frost, of perhaps the scoring draughts of wind-driven sand, and because the incessant repetition of these small causes of decay produces a great accumulated effect, that we regard time as destructive. But too much attention cannot be given to the consideration that it is the action of severe frost on stone containing water that is the main cause of decay. And we venture to suggest, as a subject for careful chemical analysis, how far the existence of water, or the elements of water, not as moisture, but as chemically combined with lime, magnesia, or other elements, in a stone, may render it susceptible to the attacks of frost. That idea is, perhaps, a new one; but we feel certain that the hygrometric relations of marble and compact limestones are not by any means clearly understood. The effect of frost on these stones has been shown. This view of the case makes it the more necessary to repeat and to comprehend the experiments of Professor Pfaff on granite. In anticipation, any one would have said that polished granite would be the most durable; and the idea that it would most thoroughly throw off the rain, and thus escape soaking and subsequent frost-splitting, concurs with this anticipation. If the case really prove to be the reverse, we can see no explanation for it, except in the possibility of the bruising of individual molecules of felspar in the process of polishing, so as to make them more readily absorbent. But this is a subject that will repay the most careful experiment.

As to the Wiltshire monoliths, we think that the whole inquiry above mentioned points in the direction of their immense antiquity. The only chance, so to speak, of Time for attacking them is when they are so set as to expose the ends of what really is, though not visibly, the bed-course. Those who know Avebury will remember the marks of decay on some of the 18-ft. monoliths that form the sides and roofs of the cellæ. The inference, seen from the light of the Edinburgh observations, points to enormous age. Let us add that, at a distance from the spot, we have no means of determining the chemical constitution of the "blue stones" in the inner ring of Stonehenge, or their present condition as compared to that of their giant brethren in the trilithons. Here is a subject for careful observation, analysis, and record. And it may prove that a comparison of the chemical constitution and lithological condition of these two kinds of stone may enable the man of science to construct something of an archæological calculus that will throw light on the date of Stonehenge.

BUILDERS' MACHINERY AT THE ROYAL AGRICULTURAL SOCIETY'S SHOW, READING.

THE exhibition of machinery of especial interest to the building and allied trades was this year more limited than usual, owing, doubtless, to the long-continued depression in this particular branch of engineering; there was however, a considerable number of exhibits well worthy of notice. The saw-benches and wood-working machines shown by the agricultural houses were far behind the times, the designs in many cases being poor in the extreme. This is the more extraordinary, as the steam-engines exhibited by many of the same firms were of the highest class.

Amongst the steam-engines especially suited for saw-mill work, a horizontal compound condensing engine was exhibited by the Reading Ironworks Co. The cylinders are placed one behind the other, the high-pressure cylinder being nearest the crank shaft; the steam-ports are kept short by placing the expansion or outer valve eccentric close up to the main shaft bearing, and carrying the connexion straight through to the valves. The exhaust-valve eccentric is outside the one working the expansion valve, and its rod is connected to a pin, on one side of a hollow wrought-iron sleeve carried in double guides. On the opposite side of this sleeve, another pin connects to the exhaust-valve rod, so transferring the motion of the exhaust eccentric from the centre line of the latter to that of the valve rod, which is situated nearer the centre of the cylinders. The governors are of the Porter type, with ports shaped so as to alter, automatically, the point of cut-off. Variable expansion is applied to the high-pressure cylinder. Taken altogether, this engine must be pronounced a first-class specimen of its type, and a strong contrast to the wood-working machinery exhibited by the same firm, which is very second-rate, both in design and construction. The Reading Ironworks Co. also showed

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a brick and tile-making machine in motion. This was of compact design, and mounted on rails, so that it could readily be run to different parts of a field, thus avoiding the expense of carrying the clay to the machine. A pitch chain, in lieu of a belt, connects the pug-mill and the feed-roller.

Messrs. Marshall, Sons, & Co., Limited, of Gainsborough, exhibited a well-designed compound semi-fixed engine, which was arranged beneath a boiler of the locomotive type.

Messrs. Hornsby & Sons, Limited, also exhibited, for the first time, a compound undertype semi-fixed engine and locomotive boiler. The engine was mounted on wrought-iron girder frames, and the whole of the working parts compactly arranged.

We are glad to see the number of makers of this type of engine increasing, as from its extreme economy in working it should be the fixed steam-engine of the immediate future. We may add that the economy of this system is due to the fact that a high pressure of steam, say 100 lb. per square inch, is first used in the high-pressure cylinder, and afterwards expanded down to as low a pressure as possible in the low-pressure cylinder, thus, practically speaking, using the steam twice over.

The largest exhibit of builders' and saw-mill machinery was made by Messrs. Charles Powis & Co., of London. This included a well-designed general joiner, joiner's bench, panel-planing, band-sawing machines, &c. The joiner's bench was arranged for circular and band sawing, grooving, rebating, tenoning, and boring, and is well adapted for establishments of small size. The tenon-cutting was performed by circular saws, two of which were mounted on the saw-spindle in the usual way, and two smaller ones arranged horizontally on vertical spindles. The wood to be tenoned is cramped vertically in a slide arranged to traverse on the top of a long fence, and passed between the two first saws which cut the sides of the tenon, and afterwards between the small horizontal saws which cut the shoulders, thus completing the tenon at one operation. The main frame of this machine is cast in one piece, thus securing rigidity in working. A single-spindle moulding and shaping machine, arranged with idler pulleys, was also shown; by this arrangement the action of the moulding cutters is instantly reversible, thus enabling the cutters always to work with the grain of the wood.

Messrs. Reynolds & Co., of London, showed a considerable number of machines for builders' purposes, including a single deal frame, surface-planer, band-saw, &c. The deal frame is compactly designed, and appeared to work well; the swing frame carrying the saws is made of wrought-iron, faced with steel, the sides and cross-bars being mortised and tenoned together, thus combining strength with lightness. The weighting arrangement for keeping the deals down when being sawn is simple and effective. The band-sawing machine shown was of the hollow or cored column type, and fitted with tension spring and the usual adjustments. Panel planing, surfacing, aud mortising machines completed the display.

Messrs. H. Wurr & Co., of London, showed a small collection of wood-working machinery, which did not, however, possess any special feature of novelty,—and several of the "Ord" gas engnes. These appeared to work well, without excess of noise, and should be serviceable to users of small power.

Mr. Hindley, of Bourton, exhibited a number of neatly-made engines and some sawing machinery. Amongst the engines was a newly-designed vertical, in which we were glad to see Mr. Hindley has increased the size of the cylinder and boiler per nominal horse-power. It is fitted with a Porter's governor, water-tank, foundation, a simple feed-pump, and the usual fittings found in engines of this class. The saw-benches appeared well made, but we should prefer to see a considerable addition of iron in the main framings.

Messrs. Hempstead & Co., of London, showed several well-made engines and some sawing machinery; the latter was not by any means remarkable.

At the stand of Messrs. Abbott & Goosey, of Stamford, we noticed a remarkably cheap light hoist, well adapted for builders' use, or where it is required to raise goods from one floor to another. This hoist is worked by a handle operating a worm and worm-wheel, and the handle being placed in the front of the machine it can be fixed against a wall, or in any desired position; it is also so arranged that it cannot run back while working.

A useful guard for circular saws was shown by Mr. R. Taylor, of Bury St. Edmunds.

Amongst other machines, Messrs. Ben. Reid & Co., of Aberdeen, exhibited a simple form of root-extractor, which can also be used for lifting stones, &c. By means of a long lever acting on a catch-wheel and pawl, a man is capable of exerting a power of from five to six tons, thus enabling him to lift large tree-stumps or stones sufficiently high to allow a truck to be placed beneath them.

A somewhat novel mixing-machine was exhibited by the Standard Emery Wheel Company, London. This machine consists, briefly, of a pugging or mixing box, in which the mixing-blades revolve, a to-and-fro motion being imparted to this box in addition to the circular motion of the mixing-blades. A saw-sharpening machine was also shown here. In this machine the saw being sharpened was arranged to bevel, instead of the revolving emery wheel, as is the case in most machines of this class. Brick-making machines were shown by Messrs. Whitehead, Pinfold, Fawcett, and others, but most of them are too well known to need description; as are the stone-breakers exhibited by Messrs. Marsden & Hall.

A capital display of brickfield machinery was made by Messrs. E. P. Bastin & Co., West Drayton: this included wash-mills and elevators, pug-mills, chain driving-gear, &c. A horizontal high-speed pug-mill was driven by an independent shaft and intermediate gearing, which is somewhat an improvement over the old form. Taken altogether, the design and construction of the machinery on this stand is in advance of what is usually found in a brick-field.

We must not omit to notice a novel form of self-acting vertical portable engine exhibited by Mr. Mather, of Wellingborough; it is without eccentrics, piston-rod, or slide-valves. Two fly-wheels are fitted on the crank shaft, and these are made to do duty for travelling wheels. We wait with some interest the further development of this invention.

A considerable number of contractors' and other pumps were shown, some of them in motion; the most novel was a Root's continuous-action revolving pump, at the stand of Messrs. Hayward Tyler & Co., London. The continuous action of the pump is secured by two peculiar-shaped vanes, revolving in opposite directions in a cast-iron casing; these vanes are so arranged that a constant rolling contact is kept up between them, which makes them, practically speaking, watertight. As each vane revolves on its centre, one half forms a vacuum between it and the outside casing, into which the water flows. As the motion is continued, the opposite end comes round and drives the charge already taken in before it, at the same time creating a vacuum behind it, which in turn is filled with water, and discharged at the next revolution. This constant charging and discharging goes on simultaneously with both vanes, hence a constant and steady flow is the result. The pump exhibited was made in America, and is certainly a remarkably crude specimen of American engineering skill.

Messrs. Priestman Bros., of Hull, as usual, showed one of their patent dredgers and excavators. These are too well known to need description. A new grab bucket for dredging mud, clay, &c., was, however, attached, and also one for dredging sand. The edge of this bucket was arranged with a series of long steel points, which penetrate the sand when dropped on it, but when the bucket is closed interlock with each other and thus prevent the escape of the material.

Messrs. Batho, of Westminster, exhibited one of Bruce's patent excavators, fitted with a four-segment bucket and an arrangement for forcing the blades of the excavator into hard soil; these should be very useful for harbour work, and for corners where the ordinary form of dredger cannot be applied.

Kendal.—Extensive alterations are in progress at the St. George's Schools, Kendal. Four large class-rooms and a parish or vestry meeting-room are being added, with new vestibule and staircase, and the entire range of schools and class-rooms is to be heated by hot water. The architect is Mr. D. Brade, of Kendal.

MUSEUM GRANTS.

ALL interested in art must have felt that there was cause for congratulation in the generosity of the special Government grant by means of which the nation has been recently enabled to acquire a number of artistic treasures such as do not every day offer themselves for sale. When it is remembered how largely our national collections have been enriched by private generosity, it is gratifying to see such interest expressed in quarters usually accused of being deaf to any extraordinary claim made upon their funds. It is by this wise and judicious exercise of private and public generosity that our national collections have, within comparatively only a few years, acquired the position they at present hold, and which so justly excites the admiration and envy of less fortunate foreign countries. When, now very nearly fifty years ago, the engraver, John Landseer, the father of Sir Edwin, wrote his "Descriptive, Explanatory, and Critical Catalogue of Fifty of the Earliest Pictures contained in the National Gallery" (1834), the collection could ill vie with those of foreign nations. Thanks, however, to the efforts of successive Directors and Keepers, to Government grants, and to bequests, our National Gallery now holds its place among the finest in the world. As for our museums, fifty years ago the British Museum stood alone, while our South Kensington Museum has, as every one knows well, been called into existence, with its wonderful and almost unique gathering of treasures, within barely twenty-five years. All these are facts with which every one in England is familiar, and of which we have just reason to be proud. Foreign countries, however, are only commencing to notice the fact that where, but a few years since, their galleries and museums were unrivalled by anything certainly that English travellers were accustomed to see at home, now our collections are yearly becoming richer in the very treasures that previously formed the characteristic features of their own museums and galleries. Bequests and purchases of princely magnificence and of almost unimpeachable quality constantly come to swell our national gatherings, while abroad, private generosity is scarcely known,—a direct result of State interference in all matters,—and the grants for purchases, small as they are, and sub-divided among a number of museums, are only grudgingly accorded. Under these conditions the *prestige* of some of the galleries is slowly being threatened, and while we in England are constantly instancing for argumentative purposes the Continental museums, they, on their side, are commencing to point to us and our gatherings to rouse a spirit of national pride and emulation. On our side of the Channel the question of special Government grants for the purchase of works of art has been recently roused by the claim made by the authorities of the National Gallery for funds to enrich the collection under the exceptional opportunities that have been afforded to the art world this season. On their side of the Channel the French have had their attention drawn to the question by the approaching discussion to be held in the Chamber respecting the sale of the Crown jewels, the proceeds of which, it has been suggested, would permanently increase the purchasing funds now at the disposal of the Museum authorities.

An article which recently appeared in the pages of the *République Française*, emanating,—judging, at least, by the initials "O. R.," those of M. Ollivier Rayet,—from high quarters, has urged upon the attention of the French public the consideration of the question of the daily-increasing position of inferiority in which the French museums are being placed by the rapid strides in this direction made by other countries, notably England; and certainly, when each year brings round the report of our Museum authorities, the list of our acquisitions is somewhat striking.

Without bringing into the comparison such gatherings as those of Rome, Florence, and Naples, the Vatican, Lateran and Capitol, the Uffizi, the Pitti, and the Bargello, or the Museo Borbonico, formed in the past, and under conditions which it would be impossible ever to expect to see revived, when the French collections are compared with those of Vienna, the Belvedere, the Ambras, and the Hofburg, those of Munich, the two Pinakotheks and the Glyptothek, those of London, Berlin, or St.

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Petersburg, rich though the Louvre, the Cluny, the Luxembourg, Versailles, and Saint Germain may be, it becomes evident to all familiar with the collections of Europe that France has of late not made such advances as its foreign rivals. It is the desire, we have heard, of the present director of our National Gallery to make the collection under his charge eminently representative; and certainly within a few years this laudable aim has been largely attained. Our French friends, however, have scarcely done as much, and had it not been for the generosity of the journal *L'Art*, the Louvre would have been unable to show, as representative of our English school, anything more than one small Bonington and two or three Constables, one presented by Mr. Lionel Constable, the others by Mr. John Wilson, now some ten years or so since. Of Reynolds, Gainsborough, Hogarth, Turner, David Cox, Wilson, and many other of our painters, there exists not a specimen in the French National Gallery.* In works belonging to the old German, the Cologne, and Flemish schools the collection is equally wanting; while in early Italian masters, taken as a whole, we are, the French frankly admit, far ahead; in these works we are, says the writer to whom we have referred, "very far inferior to Berlin and London. In German and Early Flemish pictures we are fifth in rank. In Flemish masters of the seventeenth century we must yield the palm to Munich and St. Petersburg. In drawings" (we continue to quote) "numerous and varied as is our Louvre collection, London and Berlin are treading close upon us.† In Renaissance sculptures we are at the head, though Berlin stands very near, and London is not far behind. In small objects belonging to the same period, in bronzes, and in gold and silver smith's work, we come after Vienna, and we are almost on a par with London, though we are superior to Berlin. In the matter of antique marbles, the possession of the pediments and friezes of the Parthenon, the Phigalian marbles, those of Halicarnassus, of the avenue of the Branchidæ, and the monuments of Xanthus and Ephesus, assure the British Museum a superiority over the whole world. Munich, again, is superior to us in the possession of the Æginetan marbles; but we come far before Berlin, Vienna, and St. Petersburg."

"The collection of ancient bronzes of the British Museum is very much superior to that of the Louvre; the collections of Munich, Vienna, and Berlin are, in this respect, poor. We do not by any means come first in our collection of vases; the collections of Berlin and London are superior. We have, however, the advantage in terra-cottas." It is, it must be remembered, an eminent archæologist who thus gives his candid and impartial opinion. "In gems, intaglii, &c., we are almost equal to Berlin, but we cannot for an instant rival St. Petersburg. Our collection of coins has long been the most beautiful, and it remains the largest; but in the Greek series, Berlin and London possess rarer specimens, and in a better state of preservation. Our Egyptian museum is by far the finest of all, the second and third rank belonging to Turin and Leyden; our Assyrian collection, however, considerably as it has been of late enriched, is nothing beside that of London."

"In sum," remarks our contemporary, "it will be seen that in modern works of art France holds the first place; in ancient art, England alone stands foremost. In both and all there are compensating possessions. We have a feeble advantage over Berlin and Munich, a greater over Vienna and St. Petersburg."

Certainly, in comparing the sums annually expended by us, by Prussia, and by France, it is easy to understand the advances made by ourselves and the Prussians; France allows, it would appear, very little over 8,000*l.* annually (202,000 francs).‡ Such a sum can be ill compared with the over 16,000*l.* (325,000 marks) granted by the German Government for similar purposes,—a sum in which are not included the funds allotted to the new National Museum. With regard to the amounts which we spend, it is somewhat difficult to come at definite figures, there being so many items, extraordinary grants, bequests, &c., to take into consideration; setting down, however, the British Museum at over 6,000*l.*, the National Gallery at 10,000*l.*; the South Kensington Museum, at 6,000*l.*, and 1,000*l.* for the National Portrait Gallery, we reach a total of over 23,000*l.*, which certainly stands very well beside the French 8,000*l.**

The matter, however, of special grants must be taken into consideration. France last year, we learn, granted some 5,500*l.* for the purchase of M. de Sarzec's Chaldean antiquities, and again this year the same sum for the purchase of four pictures by the late Gustave Courbet, and a further 8,000*l.* for the Timbal collection, a total for this year of 13,500*l.*, a larger sum than has for many years been granted; adding this figure to that of the annual grant (8,000*l.*), the grand total in an exceptional year reaches the figure of 21,500*l.* The Berlin Museums, however, obtain also extraordinary grants; indeed, the Prussian budget is admirably elastic, and in the Crown Prince any expenditure for art-treasures invariably finds a warm advocate. A serious article which appeared in January last in the pages of the *Revue des Deux Mondes*, and treating of the organisation of the Berlin Museums, stated that the mean German expenditure, taking the years between 1873 and 1881, is 26,000*l.* As a further means of increasing their collection the German Government has generously encouraged by large grants a series of excavations in Greece and elsewhere; the excavations at Olympia alone have, within the last six years, cost an enormous sum, and those of Pergamus, still progressing, more than 12,000*l.*

The generosity of our Government is scarcely less noticeable, and of late years the special grants that have enabled us to enrich our museums and galleries with numerous treasures cannot but be a matter for just pride. Within only a few days, and in the midst of harassing political events, the large sum placed at the disposition of the authorities of the National Gallery,—report has stated the sum to be 30,000*l.*,—is only another proof of the importance attached by the Government to the increase of the national collections.

THE NEW AUSTRIAN REGULATIONS FOR THEATRES.

As a pendant to the official report of the Prussian Academy of Architecture, which we published last week in reference to safety from fires in theatres, we reproduce this week the chief portions of the Ordinance recently issued by the Governor of Lower Austria with a similar object. The document is of great length consisting of 114 paragraphs, but all that is essential will be found below. It is entitled "Conditions to be complied with in the case of theatrical representations in new theatres, as well as in the arrangements and working of theatres in general; and the measures for enforcing the exact observance of the same."

In Section I., which is entitled "The Site and Construction of New Theatres," the principal paragraphs are the following:—

Site.—New theatres must be so built that they stand detached on all sides, and are at least fifteen mètres (that is, 49⅛ ft.) distant from the neighbouring buildings, objects, or boundaries.

Walls.—All the containing walls, staircase walls, and fireproof walls must be constructed of solid or massive materials.

Shutting-off the Stage from the Auditorium.—The stage part of the house, including the stage itself, the parts beneath it, and the subordinate rooms around it devoted to stage purposes, such as the dressing-rooms, wardrobes, tailor's room, rehearsal and ballet saloons, &c., must be shut off from the auditorium and its adjacent rooms, passages, corridors, &c., by a fireproof wall, at least 0·60 mètre (or 2 ft.) thick, and extending for 0·45 mètre (or 18 in.) above the level of the roof, and downward under the stage to immediately beneath the *podium*. In this dividing wall it is allowable to make, in addition to the proscenium opening, only one connecting aperture, leading, namely, from the vaulted passage in the pit (*parterre*) mentioned in a later section, and this latter opening is to be secured by an iron door, closing of itself.

Fire-proof Construction.—Both the stage side of the theatre and the auditorium must, in all their constructive parts, be built of materials proof against fire.

Height of the Stage Side.—The stage part of the theatre must be of such a height that the scenes can find room above without being rolled up.

Apartments attached to the Auditorium.—On the outer border of the auditorium it is permissible, as a rule, only to have passages, corridors, staircases, loggia, foyers, or buffets; that is, only such places as will afford means of egress or refuge to the audience.

Dwelling Apartments and other Subordinate Rooms.—Except the rooms set apart for the watchmen, the inspector's room, the office, the dwelling apartment for the house-cleaner, and the storerooms for the wardrobe and other articles in current use, it is absolutely forbidden to have in the theatre building itself any dwelling or storerooms, scene-painters' rooms, workshops, or refreshment-rooms, or any other apartments whatever.

Passages or Corridors in the Auditorium.—Around the auditorium there must be for each floor or tier, including the pit, a fireproof vaulted passage or corridor, at least 2·50 mètres (8 ft.) in width, leading immediately to the exit staircases or way out.

Tiers.—In addition to the pit and pit boxes the auditorium must not have more than four tiers at the utmost.

Level of the Pit.—The *niveau* of the highest point of the pit (the top of the central passage) must not be higher than 2 mètres above the level of the street, and the passages out from the pit are only to be by inclined planes.

Stairs.—Both the auditorium and the rooms subordinate to the stage must on all floors be provided with fireproof straight-armed staircases leading directly into the open air or street. In particular, each tier and gallery in the auditorium must have a staircase on both sides of the house. The stairs of one tier must not communicate with the passages belonging to another. The staircases must be at least 1·50 mètres (or about 5 ft.) in width, safe against fire and against falling in, and must be vaulted underneath; they must consist of straight arms, in equal sections without intermediate steps, and have full, solidly built axes. The stairs in the auditorium division of the theatre are to be built in such a direction as will facilitate the clearing of the house in the most rapid manner, and so as to be easily found and accessible by the shortest distance from the inner part of the house. The landings are to have the same breadth as the stairs or their sections.

Doors of Exit.—The passages leading out of the auditorium must be sufficiently numerous to enable a full house in ordinary circumstances to be completely cleared in four minutes at the most. The doors of all the ways out must open outwards. Fixed wings of doors are in no case admissible. The doors of boxes may open inwards or outwards.

Orchestra.—Prompter.—At least one special passage must be made for the members of the orchestra, and it must not run either through the pit or beneath the stage. The prompter and lamplighter must also have access, or a safe means of egress by way of the orchestra.

The Court Boxes.—In addition to being more roomy than the average, the Court boxes must have an ante-room and a special staircase, with covered carriage entrance and vestibule.

Carriage Entrance.—The theatre must have the general carriage entrance covered in.

Fireproof Safety Curtain.—The proscenium opening must be provided with an opaque fireproof curtain in permanent use, and capable of shutting off the gases of combustion. Only metallic materials must be employed in the fittings of this curtain. No doors or other openings can be allowed in it. The mechanism for moving this fireproof curtain must be fixed on the podium of the stage, and none but metallic substances may be used in it. The watchman who has to manage it must have a perfectly fireproof place to stand in, and a similar avenue of egress.

Impregnation.—Non-fireproof parts of the machinery and scaffolding of the stage, the roof, and parts underneath the stage, the scene-shifting appliances, &c., must be made of materials completely impregnated with fire-resisting chemicals.

Wax and Oil Colours.—Wax and oil colours are not to be employed in the scene paintings.

Stalls.—The stalls must consist of seats that turn up, and may be with or without under-

* In the case of our National Gallery, it may be remarked that we are almost equally deficient in specimens belonging to the French school.

† Could our collection of drawings only be adequately shown, we suspect it would be found to be richer than any Continental collection.

‡ The sum as stated by the *République Française* is 192,000 francs, from which 20,000 francs have to be deducted for the Department of Chalcography, or Government Print Establishment; 40,000 francs are allowed for the Medal Department.

* Some exact figures respecting our national collections it would be interesting and instructive to obtain.

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neath supports. The width of the space between such supports and the back of the preceding row of seats must be at least 0·40 mètre. The stalls must be at least 0·55 mètre in width, and 0·70 mètre deep, and for a numbered seat the breadth must be at least 0·50 mètre, and the depth 0·65 mètre.

Aisles or Passages.—In the pit and galleries there must be passages between the rows of seats of 1·25 mètre in width, when the seats are accessible from both sides, and of 1 mètre in width when they are accessible from one side only. These passages are to be so laid out that no spectator can be more than six seats distant from one.

The Passages to be kept Free.—Flap Seats.—The passages to the seats must be constantly kept free; they must not be stopped up, nor used as standing-places. The use of flap benches, or of movable seats or stools there, is inadmissible.

Standing Places.—It is only in the pit and galleries, or parts of the house specially set apart for the purpose, that standing-places are allowable.

Orchestra.—The place occupied by the orchestra must not be used as part of the auditorium.

Wardrobes or Cloak-rooms.—The wardrobes or cloak-rooms for the use of the public must not be placed in the passages, but must be in special apartments so arranged as to freely let the public in and out.

Illumination,—Gaslights.—With gaslights, arrangements must be made so that there may be at least one separate supply of gas direct from the street pipes for the illumination of the auditorium, including the large chandelier and the tier parapets, and another similarly independent supply for the stage side of the house. The gas must be conducted over the house only in iron tubes. Only where iron pipes cannot be used, spiral hose may be applied in exceptional cases. The common india-rubber pipes are in no case to be employed.

Gas Meters.—Each of the main gas-pipes must be provided with two gas-meters connected with each other. The meters belonging to the auditorium must never be fixed near those belonging to the stage, but must be placed in different apartments. There must be no taps attached to these gas-meters.

Electric Lighting.—When a theatre is lighted by electricity, the installation must be arranged so that the illumination of the auditorium is wholly independent of that of the stage. In the two parts of the theatre the installation must provide two separate systems or independent circuits, each with its own lighting machines and apparatus. The wires must be sufficiently stout to prevent their being overheated; they must be carried along a groove in the wall and secured against being injured, as well as against the possibility of the audience coming in contact with them. The electric lights must be provided with glass globes, and so fixed that it is impossible for particles of the carbon points to fall out. The motors driving the lighting machine must, in case fire is employed in them, be fixed up outside the theatre building.

Soffits.—The flames in the soffits must be perfectly guarded so that no portion of the protective covering can be heated by the caloric that is given off.

Lighting up.—The lighting up of the gas flames illuminating the soffits must only be effected when the soffit-sashes are let down.

Lucifer Matches.—Wax Tapers.—The use of lucifer matches or open burning wax tapers is forbidden without any exception.

Emergency Lights.—In the auditorium, as well as in the outer passages or corridors, and staircases, and likewise in the subsidiary apartments on the stage side of the house, if they are lighted with the electric light or with gas, there must be introduced, in addition, another set of lights (oil lamps) against cases of emergency. All doors, in particular those leading out of the inner rooms of the auditorium, must be lighted with red emergency lights, and in such a way that there may at the same time be both direct access of the air from without and a drawing off to the outside of the gases of combustion.

Heating.—Theatres used in winter must be warmed by the central heating system, the auditorium and stage being, however, each warmed separately. Ordinary free iron stoves are not permitted within the theatre buildings. In the central system, particularly when air is used, the openings designed to let the heat out must be furnished with fine meshed wire netting. No readily inflammable objects must be permitted in proximity to such openings.

Chimneys.—The stage roof must be provided with one or two openings or chimneys leading directly to the open air, in order, in case of an outbreak of fire on the stage, to allow the products of combustion to escape. The section of these openings should be equal to at least one-fortieth of the surface of the podium of the stage. The closing apparatus to these openings must be so arranged that when set free they may open of themselves by their own weight.

Fire Telegraph.—The theatre should be connected with the local fire brigade by a telegraphic signalling apparatus, which should be accessible not only in the parts of the house frequented by the *personnel* of the theatre, but also in the office and porter's lodge. The apparatus should be fixed near the mechanism for moving the fire-proof curtain, and attended to by the watchman looking after the latter. A similar apparatus should be placed in the office and porters' room.

Water.—On the stage side of the house, on the boards, and in the parts underneath and above them, a sufficient number of water-cocks should be fixed and provided with hose of proper length. The watchmen attending them must have a safe means of egress provided for them. The auditorium ought to be similarly supplied with a sufficient number of water-cocks.

Requisites for Extinguishing Fires.—On the stage there must constantly stand water-butts filled with water, and with at least four fire-buckets near each. Moreover, there should also be wet coarse cloths and saturated sponges fastened to rods, as well as at least one long fire-hook on each side of the stage; and, again, there should be the requisite number of hatchets kept ready at particular spots, and sealed up by the manager. There must, in addition, be on the stage at least two "Extincteurs," kept perfectly ready for use at a moment's notice.

II. MANAGEMENT.

Commencement and End of the Lighting.—The auditorium at the opening of the theatre ought to be already sufficiently lighted. The lights, including the emergency lamps, must not be put out before the audience or theatrical *personnel* has entirely left the theatre.

Safety Curtain.—Except while a performance or general rehearsal is going on, the safety curtain is always to be kept down. It must also be let down between the acts.

Curtains, Drop Scenes, and Views.—Curtains and views of light material, such as gauze, must be furnished on both sides with ropes by which they can be moved.

Keeping the Stage clear.—The stage has to be kept as clear as possible. The decorations and requisites which may be on it at one time must not be more than sufficient for three performances. No persons except those engaged in the performance should be allowed on the stage.

Keeping the Passages clear on the Auditorium Side of the House.—All the ways out, corridors, passages, staircases, doors, &c., are to be kept free from all obstacles. The doors of egress, from the beginning of the performance to the clearing of the theatre, must be kept unfastened, and immediately before the close of the performance they must be set open.

Fireworks.—Powder.—Fireworks, gunpowder, and other explosive materials must under no circumstances be kept inside a theatre. When such things are required for any performance they must only be brought into the building immediately before the performance, and be at once placed under the special supervision of the firemen. In firing shots only stoppers made of calf-hair may be used.

Testing Impregnation.—Impregnation must be subjected to special examination by the authorities in order to test its completeness and efficacy before the impregnated articles are used on the stage. In general, too, the durability of the impregnation is to be tested at least twice a year. If the examination leads to an unsatisfactory result, the article concerned must not be employed for theatrical purposes, as a supplementary impregnation by a mere outer application is insufficient. In the Vienna police district the examination of impregnation is to be performed by the highest civic Board in co-operation with the chief of the police; and outside that district by the town council in case of towns with special charter, and by the political district Board in combination with the communal authorities in other places.

Regular Ventilation.—On the days of performance care must be taken that the air in the auditorium and stage is sufficiently renewed. In case of two successive performances on the same day an interval of at least two hours and a half must be allowed to elapse between the first and second performance for the purpose of sufficiently airing the different parts of the house.

Lamplighters.—The person entrusted with the lighting up of the theatre and his assistants are to be made thoroughly acquainted with the entire lighting arrangements of the house; they are further to be furnished with exact and authorised instructions as to their duties, and the names of these persons are to be specially deposited with the authorities.

Firemen.—The fire service during the performances, together with the attendance at the water-cocks, must be entrusted to the hands of well-drilled firemen and trustworthy watchmen, and must be arranged so as to insure to the utmost possible extent the safety of the house. The men entrusted with the duty of fire-watchmen must under no circumstances be employed for any other purpose during the hours they are on this service.

Testing of the Fire Telegraph.—The fire telegraph must be tested every day about noon, so that in case it should get out of order there may be plenty of time to repair it.

House Regulations.—Every theatre must be provided with a code of regulations. In this there must be specially mentioned the rules respecting the inspection of all parts of the house before and after each performance; also respecting the use of fire and lights in the building, and in reference to the first steps to be taken in case of an outbreak of fire.

Responsibility of the Lessee and Manager.—The lessee and manager is responsible for the exact and conscientious observance of all the conditions laid down in the present Ordinance, or connected with other prescriptions contained in his licence. He is also responsible for the provision of proper measures, so that, in case of fire breaking out, the public in the auditorium may receive proper and timely warning.

INSPECTION OF THEATRES.

The duties connected with the inspection of theatres are to be discharged by officers representing the chief office of the police in the Vienna police district, and on the part of the fire-police by technical officers appointed by the chief civic council or by the communal council, as the case may be; and, out of that district, by the communal board. These officers must attend at the inspector's office in the house an hour before the commencement of the performance, and are to proceed to inspect every room in the theatre in reference to its arrangements for personal security and safety from fire. Anything they find amiss they are at once to rectify. A medical man (surgeon) must be present at every performance in order to render medical assistance when it may be required. The lessee and manager must deposit the name of this medical man with the authorities.

A final paragraph forbids the authorities to allow performances to go on in any theatre where any of the above rules are not observed. The Ordinance, it is further expressly stated, applies to circuses, rope-dancing performances, fireworks, and all exhibitions of a similar character.

THE GROWTH OF ANTWERP.

THE traveller who, after an interval of two summers, proceeds at the present time on a visit to Antwerp, cannot fail to witness with amazement the total transformation which, within so brief a period, has come over the city. The familiar features of the place have been effaced, and its physiognomy entirely changed. The old quay, running for nearly a couple of miles along the eastern bank of the Scheldt, is no more. The rows of umbrageous trees, beneath whose grateful shade we may once have sauntered amidst vast piles of merchandise, are gone for ever, and with them has disappeared the long line of *cafés, restaurants, estaminets*, beer-houses, tobacco-shops, shipping-offices, and other establishments which had, from time immemorial, formed the river frontage from one end of the city to the other. But for the cathedral, with its lace-work tower and cheerful carillon, the traveller can hardly recognise Antwerp again, so com-

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plete is the change which has been wrought within two to three years. It is not simply that the line of houses fronting the river has been removed; whole streets behind them have been demolished, and probably not less than one-sixth of the entire population of the city has been dislocated.

The cause of this remarkable transformation is not far to seek,—it is due to the rapidity of the recent growth of the commerce of Antwerp, a rapidity which, in Europe, is without example. As the British Consul mentions in one of his reports, while the shipping and commerce of Havre or Liverpool have been growing four-fold, those of Antwerp have actually increased sixteen-fold. M. Royers, the town architect and engineer, says that the traffic has been regularly doubling every eight to ten years. The inward tonnage of vessels for the port of Antwerp in 1850 was, in round numbers, 250,000 tons. In 1865, it had risen to 750,000 tons; while in 1880, it was over 3,000,000 tons. This enormous and, in Europe, unparalleled increase is due to the favourable situation of the great Belgian port, which is more easily accessible than any other shipping centre to the vast population of Central Europe.

The building and engineering improvements undertaken within the past few years in Antwerp are only surpassed by the greatest works of a similar nature that have been carried out in London and Liverpool. Foremost in the changes in the Belgian port is the new quay, which extends, as we have already intimated, along the whole right bank of the river Scheldt from one end of the city to the other. Its length when complete will be over two miles. The work is being carried out at the expense of the Belgian Government, and the total cost is estimated to amount to more than two million pounds sterling. Of this sum 38,000,000 francs have already been voted by the Belgian Legislature for the construction of the new quay itself, while an additional 18,000,000 francs has been expended in the compulsory expropriation of the proprietors and tenants of the long line of houses forming the old river frontage. The new Antwerp quay is, in fact, a work second only to the Thames Embankment. The new quay will be 100 mètres broad, or about three times as wide as the old one. Upwards of one half of the work is already completed. The contractors who have undertaken the whole work are Messrs. Couvreux & Hersent, of Paris.

In addition to the quays, extensive new docks have likewise been begun, the expense being, in this instance, borne by the municipal authorities of Antwerp. The two great Belgian railway systems, the Belgian State railways and the Grand Central Belge, both run up to and alongside all the docks and quays. Some idea of the vastness of Antwerp trade may be formed from the fact that, even two years ago, the number of railway goods wagons which arrived at the docks and quays numbered over a million. There were 863,633 which came by the Belgian State lines, and 157,595 by the Grand Central Belge, numbering together 1,021,228. Of this number nearly three-fourths brought merchandise, and unloaded at the docks and quays.

At the present time the vicinity of the new quay is one in which the builder is busy. New houses, larger and finer than those which have been pulled down, are being erected very rapidly. In fact, in the course of another year or two Antwerp to the traveller arriving by steamer from the river will present the appearance of a brand new city. A terrace of houses, two miles in length, all of them perfectly new, will ere long form the river frontage of the city.

The traffic which passes through this port to and from Germany and other countries of Central Europe is already enormous, and it is every day increasing. The route to England *viâ* Antwerp and Harwich has become the favourite one with the Germans, and the traffic has so augmented that the Great Eastern Company, at the commencement of the present month, commenced running a daily line of steamers between the two ports just mentioned. The opening of the St. Gothard Tunnel is another event which has added to the traffic of Antwerp, and particularly to the English trade *viâ* Harwich. The Great Eastern Company are now every day bringing considerable quantities of Italian produce to England. This merchandise all comes through the St. Gothard tunnel *viâ* Switzerland and Germany to the Belgian port. Antwerp, in fact, has the good fortune of being nearer to Milan by rail than any other port of Western Europe. The distance is 1,178 kilomètres, while the distance from Calais to Milan, *viâ* the Mont Cenis tunnel, is 1,354 kilomètres, giving to Antwerp an advantage of 100 miles, a matter of no little importance when the extra cost of carriage by rail is considered. The distance from Boulogne to Milan, *viâ* Mount Cenis, is 1,311 kilomètres, while from Ostend, *viâ* the St. Gothard, Milan is 1,258 kilomètres distant, so that Antwerp is 50 miles nearer than Ostend and 83 miles nearer than Boulogne. Even if the French and Swiss Governments agree to carry out the proposed Mont Blanc or Simplon tunnel, Antwerp will still be nearer to Milan by the present route, *viâ* the St. Gothard, than any of the other ports will be by either of the proposed routes. Moreover, as the latter cannot be completed for at least seven or eight years to come, the Belgian port has the advantage of a start in attracting traffic of which it will afterwards be difficult to deprive her.

Another improvement which is being carried out at Antwerp is the erection of a railway station close to the quay where the Harwich steamers land their passengers, so that before long travellers from England, who wish to proceed on their journey, will soon be able to walk direct from their boat into the railway carriage instead of having to drive through the city as at present.

The effect of the growing importance of Antwerp for the English and Continental passenger and goods traffic has made itself distinctly felt on the English side of the North Sea. In fact, it has led to the foundation of what will ultimately be a new town in the county of Essex. The present accommodation at Harwich has been found inadequate to the increasing trade, and accordingly the Great Eastern Railway Company have erected on the estuary of the Stour, three-quarters of a mile from Harwich, a splendid new quay, where its vessels will land passengers and goods in future. This new port has been named Parkeston. The quay there is 1,800 ft. in length, and is provided with warehouses, 1,400 ft. long and 60 ft. broad. Close by the quay it is intended to erect a new railway station and an hotel, with extensive waiting-rooms for the convenience of passengers passing to and fro between England and the Continent. There are also to be erected bonded stores, customs offices, offices for merchants and workmen, so that, in fact, as we have mentioned, the growth of Antwerp, added to the existing traffic with Rotterdam and other ports, has led to the foundation of a new town in England. Parkeston will, in future, be the port through which a large traffic, not only between London and the Continent, but between the middle and North of England and the Continent, will pass, the company having completed certain extension lines which will bring the port in direct communication with Birmingham, Manchester, Sheffield, Leeds, Nottingham, and the other great manufacturing centres of the kingdom.

The inauguration of the daily service of steamers which has just been opened between Harwich and Antwerp was celebrated last week by a splendid banquet at Antwerp. The guests included, in addition to a number of English gentlemen, the representatives of no fewer than five Continental states, whose Governments and railways are interested in this line of steamers. The company proceeded on a most enjoyable trip down the Scheldt, and in the splendid saloon of the Great Eastern Company's steamer, *Adelaide*, the banquet was served. The first toasts proposed was "The Queen of England, the King of the Belgians, and the Emperor of Germany," given by the chairman, Mr. Gooday, who represented the Great Eastern Company. M. Huger then gave the "Belgian Government and the City of Antwerp." The speaker pointed out the inestimable services both were rendering to the great Belgian port. The toast was responded to by M. Semblancx, Under Secretary of Public Works, on behalf of the Belgian Ministry, and by MM. Allewaert and Cuylits, Sheriffs of Antwerp, on behalf of the municipal authorities of the city. "Success to the Continental railways concerned," "Prosperity to the Great Eastern Company, and its daily service of steamers to Antwerp," and "The health of the English and Belgian press," were among the other toasts given at this charming *fête*.

New Schools are to be erected at Cheltenham, from designs by Messrs. Chatters & Channon, which were selected in competition.

THE RECENT SMOKE ABATEMENT EXHIBITIONS.

MEDALS AND OTHER AWARDS.

THE medals and other awards adjudged to exhibitors in the Smoke Abatement Exhibition opened last year at South Kensington, as well as to exhibitors in the more recent exhibition held in Manchester, were formally presented on Friday, the 14th instant, at Grosvenor House, by the permission of the Duke of Westminster, who himself presided over the large and influential meeting which assembled. His Grace, in opening the proceedings, observed that he was much gratified in being able to claim for the efforts of the Smoke Abatement Committee a considerable measure of success. Their exhibition at South Kensington had been attended by no fewer than 116,000 persons. With regard to kitcheners, the results attained appeared to be very satisfactory, but the question of an open grate still remained an open question, although it might confidently be hoped that an apparatus combining the advantages of consuming its own smoke with strict economy of fuel would yet be produced. Sooner or later such a grate would, no doubt, come to the front, and then the proposal might be forthcoming that the use of such grates should be made compulsory. The work connected with the recent exhibition at South Kensington had been ably sustained by Mr. Ernest Hart, Mr. Coles, and many other gentlemen well known in the scientific world. All that was needed, in his opinion, to perpetuate and keep alive the work which had been done was the establishment of an association to carry on the work of the Smoke Abatement Committee, and to aid and encourage inventors in their efforts for the attainment of the desired results.

Mr. Hart then presented the general report of the committee, which, after detailing the origin of the formation of the committee and the steps taken for the holding of the exhibition, mentioned that the testing of apparatus and fuels was made, as far as possible, under the following conditions laid down by the Committee:—

1. Domestic heating appliances, viz.:—grates, stoves, and kitcheners, and kitchen open ranges, to be tested for heating power, cost, convenience, quality of combustion, and their comparative freedom from smoke and noxious vapours. Various fuels and new appliances for the utilisation of anthracite and other smokeless coals to be tried. Gas-heating apparatus, in which great improvements have recently been made, to be tested and compared.

2. In regard to the testing of furnaces and apparatus for industrial purposes a greater difficulty presented itself; but trials of some of the more recent improvements in boiler apparatus were to be made with the special object of testing the combustion of fuel and the prevention of smoke, having regard also to evaporative performance.

The Committee (continued the Report) engaged the services of Mr. D. Kinnear Clark, M.Inst.C.E., to superintend the trials, under the direction of the Executive Committee; and Professor W. Chandler Roberts, F.R.S., drew up a scheme for the chemical testing in connexion with the trials of fuel, grates, and stoves. . . . .

The following is a list of the jurors who kindly undertook to act:—

Prof. Abel, C.B., F.R.S.; Mr. A. T. Atchison, M.A.; Lord Alfred Churchill; Mr. W. R. E. Coles, C.E.; Mr. Thomas Cundy; Mr. T. W. Cutler, F.R.I.B.A.; Mr. W. Eassie, C.E.; Col. Festing, R.E.; Prof. Frankland, LL.D., F.R.S.; Capt. Galton, C.B.; Mr. R. Harris; Mr. Charles Heisch; Mr. Charles Hunt; Mr. T. W. Keates; Prof. Chandler Roberts, F.R.S.; Dr. Siemens, F.R.S., LL.D.; Mr. G. H. Trollope; Mr. Greville Williams; Mr. D. K. Clark, M. Inst. C.E., Attesting Engineer. . . . .

At the closing meeting it was announced that there had been made altogether 249 tests, many of them of a detailed and costly character: 48 tests of steam-boiler appliances, 42 tests of coal samples, 128 tests of open grates and stoves, and so on through the whole list. A great amount of work had been done, and done with great care, and great thanks are still due to Dr. Siemens, Professors Frankland, Abel, Roberts, Mr. Atchison, Messrs. Harris, Heisch, Cutler, and the other jurors, who had given gratuitously their best care and their most valuable time, in carrying out the work of the jurors, as well as forwarding the objects of the exhibitors generally. The exhibits have been thoroughly cited in all the industrial papers. Among the visitors were reporters from the principal foreign Governments,—men such as Monsieur Tréat, the eminent president of the Society of Civil Engineers in Paris; Hirsch, from the French Government; Dr. Gustav Wolff and Dr. W. Siemens, who came here from the German Government; and the Commissioners from the American Government. Those gentlemen will make reports on what they have seen here, so that the knowledge of the exhibits will extend to other

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countries as well as our own. The Marquis of Lorne specially requested that a detailed account of the testing should be supplied to the Government of Canada.

The Exhibition has been attended by the Royal Commissioners on Technical Education, the Institute of British Architects (who came in considerable numbers), the Society of Civil Engineers (also in large numbers), the Society of Mechanical Engineers, and the Members of the Coal and Iron Trades Institute. Also large deputations attended from builders and architects; and, in addition, the builders of London sent their workmen in large bodies. The Corporations of the various towns have shown great interest in this Exhibition, and a considerable number, not only of Mayors, but of other public officials, attended personally; and further, the Corporations of Manchester, Birmingham, Sheffield, Oldham, and Leeds, sent official deputations, who have gone through the Exhibition, and who will make reports of a practical character, and present recommendations to their respective corporations. The Committee were very much indebted to the National School of Cookery, especially to Mrs. Clark, the lady superintendent, for sending her staff and making practical trials of the kitcheners. The following is a list of Governments represented by their reporters:—France, Germany, United States, Switzerland, Austria, Hungary, Sweden, Denmark, the Netherlands, China, Canada, and Australia. The total number of visitors to the Exhibition has been 116,000; of these, 46,000 were admitted by payment, there being 66,000 persons to whom we gave free admission.

The testing alone has involved an expenditure of about 1,000*l.*; for, besides the testings at South Kensington, extensive testings have been made elsewhere. We have had testing going on of machinery all over the country, in factories and other suitable places. . . . .

As a result of the visit to the Exhibition of a deputation from the city authorities of Manchester, on January 11, it was arranged to practically transfer the Exhibition, so far as it could be transferred, to Manchester, the Corporation having lent the market buildings for the purpose. To this end, the Committee, its chairman, and hon. secretary energetically co-operated.

The testings were conducted by Mr. D. Kinnear Clark on the same bases as those conducted at South Kensington.

Mr. Hart went on to say that it was the object of the Committee from the first that the Exhibition should not be merely a display of objects to interest, but that the relative power of each invention to fulfil the purpose for which it was intended should be tested by experts, and he thought that, as a whole, the tests had been carried out in a very satisfactory manner, and with exceedingly good results. They were now able to say that there was not a house or room in which it was not possible to apply a smokeless kitchener, with an absolute economy of fuel as compared with that of most of the kitcheners now in use. There had also been considerable improvements in open grates. The Committee felt that were they to end their work with the close of the Exhibition they would not have accomplished the ends desired, and it was therefore intended to establish an institute for permanently carrying on the work of the Committee.

Mr. Herbert Phillips, representing the Manchester Committee, presented the report of the Manchester Exhibition, which stated that,—

The Manchester Smoke Abatement Exhibition was the outcome of that at South Kensington. The Committee of the Manchester Noxious Vapours Abatement Association watched the progress of the Committee which organised the latter with much interest, and the abatement of the nuisance produced by smoke being congenial to their special aim, viz., the suppression of vapours from chemical and allied works, they willingly co-operated with the London Committee, and, further, determined to continue the work by endeavouring to transfer, as far as practicable, the Exhibition bodily to Manchester. The London Committee cordially received this proposal, and, in the work of organising, lent the Manchester Exhibition Committee valuable aid. A guarantee fund (the contributors to which will, however, not be called upon) of nearly 2,000*l.* was raised. . . . .

The Exhibition was opened on March 17th, by the Mayor. . . . . As a demonstration against the smoke nuisance, and as a comprehensive representation of the most approved appliances for the prevention of smoke, the Exhibition was a worthy offspring of that at South Kensington. Every effort was made to utilise the opportunities afforded by the collection of appliances for spreading information respecting them.

Lady Grosvenor then proceeded to distribute the medals and other awards, of which the following is a complete list:—

SOUTH KENSINGTON AWARDS.

Open Grates for Bituminous Coal.—To Messrs. Brown & Green, for underfed grate, Gold Medal; Messrs. Clark, Bunnett, & Co., for Ingram's Grate, for goodness of results, both with Wallsend and anthracite, Silver Medal; E. H. Shorland, for Manchester Ventilating Grate, Silver Medal; E. R. Hollands, for underfed grate, Bronze Medal; H. E. Hoole, radiating and reflecting grate, with side hopper, Bronze Medal; Messrs. M. Feetham & Co., for basket dog-grate, Bronze Medal; J. M. Stanley, for hopper-fed grate, Bronze Medal; T. E. Parker, for Vencedor grate, Bronze Medal; W. H. Henry, for respirator grate, Bronze Medal; Messrs. Doulton & Co., for tile grate, Honourable Mention; Messrs. Rosser & Russell, for fire-clay grate, Honourable Mention; Messrs. George Haller & Co., for Kohlhofer Hot-air Stove, Honourable Mention.

Open Grates for Smokeless Fuel.—To the Coalbrookdale Co., for Kyrle Grate, Silver Medal; Messrs. Yates, Haywood, & Co., for back and side draught ventilating grate, Silver Medal; M. Perrett, for radiating stove, Bronze Medal.

Close Stoves for Bituminous Coal.—To C. B. Gregory, for smoke-burning furnace, Silver Medal; John Cornforth, for the Little Wonder Stove, Silver Medal; R. W. Crosthwaite (with Gregory's Improvement), Silver Medal; Messrs. J. F. Farwig & Co., for calorigen stove, Bronze Medal; James Dunnachie, for Star Heating Stove, Bronze Medal; Rev. H. J. Newcombe, for air-warming stove, Honourable Mention.

Close Stoves for Smokeless Fuel.—To W. Barton, for Premier Gill Stove, Bronze Medal; F. Lonholdt, for anthracite ventilating stove, Bronze Medal; Messrs. Musgrave & Co., for slow combustion stove, Bronze Medal; H. I. Piron, for hot-air stove and ventilator, Bronze Medal; Harry Hunt, for Crown Jewel Stove, Bronze Medal.

Kitcheners.—To T. J. Constantine, for Treasure Range, Silver Medal; the Eagle Range Company, Silver Medal, the Radiator Range Company, Silver Medal; Messrs. Brown & Green, Silver Medal; the Falkirk Iron Company, for Dr. Siemens's principle, Silver Medal; Messrs. Newton, Chambers, & Co., for Thorncliffe Range, Bronze Medal; W. Stobbs, for anthracite range, Bronze Medal; Messrs. M. Feetham & Co., Bronze Medal.

Gas Section.

To Messrs. Thompson Brothers, of Leeds, a Gold Medal for their patent kiln and baker's oven, being a distinctly new application of the use of coal gas, and one calculated to largely promote the abatement of smoke.

Cooking Stoves (stoves suitable for families of about twelve persons).—To Messrs. H. & C. Davis & Co., of Camberwell, Silver Medal; Messrs. Beverley & Wylde, of Leeds, Silver Medal; Messrs. J. Wright & Co., of Birmingham, Silver Medal; Messrs. Stark & Co., of Torquay, Silver Medal, in recognition of the principle adopted by them of burning the gas outside the oven in which the cooking is carried on; Messrs. Billing & Co., New Oxford-street, Bronze Medal; Messrs. Leoni & Co., New North-road, London, Bronze Medal; C. Wilson, Leeds, Bronze Medal; Messrs. Waddell & Main, of Glasgow, Bronze Medal. Stove suitable for large establishments:—To Messrs. Slater & Co., of Holborn, Silver Medal, for excellence of material and workmanship.

Heating Stoves.—Close Stoves, from which the heat is conveyed into the apartment by conduction from pipes or chambers, through which the heated products of combustion pass: To Messrs. Stark & Co., of Torquay, for Cox's Ventilating Gas Stove, Silver Medal; the Sanitary and Economic Supply Association of Gloucester, for Dr. Bond's Euthermic Ventilating Stove, Pattern A, Silver Medal. Open Stoves, or Combination Fires, in which gas is burned in combination with solid materials, and the heat radiated into the apartment: To Messrs. Waddell & Main, of Glasgow, for Dr. Siemens's Gas and Coke Fire, Bronze Medal; Messrs. G. Wright & Co., Rotherham, for Dr. Siemen's Gas and Coke Fire, Bronze Medal. Gas Baskets, or Fires, from which the heat is conveyed by radiation: To Messrs. Leoni & Co., New North-road, London, for Hanging Gas Fire, Bronze Medal.

Gas Producers.—To the Dowson Economic Gas Co., Limited, Gold Medal.

Apparatus for Heating by Water.—To W. Stainton, Bronze Medal; W. & S. Deards, Bronze Medal.

Mechanical Stokers.—To George Sinclair, Silver Medal; Messrs. T. & T. Vicars, Silver Medal; the Patent Steam Boiler Co. (Knap's), Bronze Medal; the Chadderton Iron Works Co., Limited (McDougall's), Bronze Medal; James Proctor, Bronze Medal.

Fire Bridges.—To Messrs. Chubb & Co., for their Cast-iron Semicircular Fire Bridge, Bronze Medal; Messrs. Ireland & Lownds, for their Cast-iron Tubular Fire Bridge, Bronze Medal.

Fire Bars and Grates.—To the Wavish Patent Fuel Economiser Co., for an Application of Vertical Grates in Steam Boiler Furnaces, Silver Medal; Messrs. James Farrar & Co., for Barber's Underfeeding Step Grate, Bronze Medal; John Collinge, for Blocksage's External Inclined Grate, Bronze Medal; the Livet Boiler and Furnace Co., for Mr. Livet's Method of Setting Boilers and for Fire Bars, Silver Medal.

Furnace Doors.—To Messrs. W. A. Martin & Co., for a balanced fire-door, Bronze Medal; the Great Britain Smoke-consuming Company, for Orris's Steam Injector for Consuming Smoke, Bronze Medal.

SPECIAL PRIZES.

Dr. Siemens's Prize, One Hundred Guineas.—For best Utilisation of Coal.—Divided and awarded to the Dawson Economic Gas Company, Limited, Fifty Guineas; the Falkirk Iron Company, Fifty Guineas.

Ladies' Prize, Fifty Guineas, for best Smoke-preventing Coal-burning Kitchener. — Divided between J. F. Constantine, Twenty-five Guineas; the Eagle Range Company, Twenty-five Guineas.

Society of Arts' Silver Medal for the best Smoke-preventing Coal-burning Furnace. — To C. B. Gregory.

MANCHESTER AWARDS.

Open Grates and Close Stoves for Heating.—To T. E. Parker, Silver Medal; Jaffray & Co., Silver Medal; J. Wadsworth, Silver Medal; Falkirk Iron Company, Silver Medal; W. Thornburn, Honourable Mention; E. H. Shorland, Bronze Medal; Messrs. Hydes & Wigfuls, Bronze Medal.

Cooking Stoves.—To Messrs. Elliotts, Alston, & Olney, Silver Medal; Messrs. Waddell & Main, Silver Medal; C. Wilson, Silver Medal; R. W. Crosthwaite (with Gregory's Furnace), Silver Medal.

Steam Boiler Appliances.—To R. W. Crosthwaite, for Gregory's Smokeless Furnace applied to an upright boiler, Silver Medal; E. Bennis, for mechanical stoker, Silver Medal; Thomas Henderson, for furnace front and fire door, Bronze Medal; James Moore, for system of boiler seating with perforated bridges, Bronze Medal; J. Hampton, for fireproof smoke-consuming bridge, Bronze Medal; B. Goodfellow, for Johnson's Smoke and Fume Washer, Honourable Mention.

Furnaces.—To M. Perret, Silver Medal.

Remarks were subsequently offered to the meeting by some of the jurors.

Mr. R. Harris dwelt upon the advantages of using gas for fuel, especially for baking and cooking purposes. The use of gas also furnished a good supply of heat.

Professor Chandler Roberts said, when it was remembered that the smoke cloud over London contained sixty tons of carbon, it was important to know that at least boiler furnaces need smoke no longer.

After a few words from Captain Douglas Galton, Miss Emily Shaw-Lefevre, and Mr. W. R. Coles.

Professor Abel moved that the work having been thus far carried on by the Smoke Abatement Committee, an institute be formed for its continuance. He remarked that because the electric light was coming more and more into use, the gas companies need not despair of a great future, as gas might be applied for heating and cooking purposes. He pointed out how coal was wasted, not only in smoke, but in the quantity of small coal left underground, as it was said it would not be profitable to bring it up.

Mr. Norman Lockyer, in seconding the motion, said it was part of his official duty to observe the sun, but the smoke-fog of London rendered it impossible to make this observation properly more than once a week; sometimes only once a month.

This motion having been carried,

Lord Mount-Temple, in moving a vote of thanks to the Manchester Committee, said it was satisfactory to see that science had condescended to the chimney-corner and to the fireside.

The Rev. Harry Jones seconded the motion, which was carried, and on the motion of Mr. Hart, a vote of thanks was passed to the chairman.

Tynemouth.—A correspondent says:—"At this season of the year, when the question 'where to go' is discussed in many families, a healthful resort is the first consideration, and, if this can be found in conjunction with many other and almost unequalled advantages, the place offering such inducements is well worthy of patronage; and this I submit is the case with Tynemouth. Since the 31st of last December up to the present time, June 30th (half a year), there have been but 21 deaths in the whole of Tynemouth proper,—a population of some 4,000,—a death-rate of under 11 per thousand per annum." Another correspondent points to the same town as affording a satisfactory result from long-continued and careful attention to sanitary matters on the part of the town authorities.

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THE UNITED ARCHITECTS' AND ENGINEERS' SOCIETIES OF GERMANY.

THE architectural and engineering professions of Germany have never been separated as we find them in England, and in their societies the two professions are, in most cases, united. No other country in the world has so many architects' and engineers' societies and clubs as the German Empire. For some years past all the local societies have been connected together in one general and comprehensive union, which has its annual meetings, and forms a medium of communication between the members of the separate institutions. The local societies belonging to this union, together with the number of members in each, are returned as follow, at the latest date. The Architects' Society of Berlin has 1,796 members; that of Dresden, 96; and that of Leipzig, 31. The Hanover Society of Architects and Engineers has 929 members; the Bavarian Society, 743; the Kingdom of Saxony, 481; Hamburg, 329; that of the Lower Rhine and Westphalia, 219; the Middle Rhine, 180; West Prussia, 156; East Prussia, 147; Frankfort, 131; Breslau, 127; Saxony (Province) Anhalt and Thuringia, 126; Brunswick, 103; Alsace-Lorraine, 102; Schleswig-Holstein, 98; Bremen, 87; Cassel, 77; and Aix-la-Chapelle, 65. The Baden Technical Society numbers 248 members; Oldenburg, 62; Lubeck, 58; Görlitz, 45; and Osnabruck, 43; and, finally, the Wurtemberg Society of Architecture, 246. The total number of members in these local societies is, therefore, 6,725; and this is the present strength of the Architectural and Engineering Union of Germany.

FROM ARROAD.

Asiatic Building Materials.—According to a foreign journal, there has been existing for the last eight years at Tokio, China (in the suburb of Fukagavia, on the left bank of the River Sumida), a cement factory, originally established by private enterprise, but shortly afterwards purchased by the Ministry of Public Works, and extended. The fuel used is anthracite, from Kü. A burning produces 100 casks, each of 520 lb. weight, and lasts during two days, the quantity of anthracite used in the process amounting to about 900 lb. The annual production amounts to upwards of 2,250 tons. There are thirty workpeople employed, the total expenses of the construction being 25,000 yen (5,000*l.*). There was a sum of 30,000 yen (6,000*l.*) spent in trials before a serviceable cement was produced. The working expenses are 30,000 yen (6,000*l.*) per annum. A cask of 520 lb. is sold for 6 yen (24s.), so that a clear surplus of 27,600 yen (about 5,500*l.*) is realised every year. The cement is usually kept a few months before being sent out. The following is an analysis of the article at two distinct times:—

	1874.	1876.
Silicic acid	26·13	26·35
Argillaceous and oxide of iron	11·12	10·00
Lime	56·23	53·70
Magnesia	6·10	6 60
Alkalies	0·90	0·89
Carbonic acid	0·21	traces
Water	—	1·40
Phosphoric acid	—	0·28
Insoluble substances	—	traces
	100·69	99·22

The cement made in 1874 was able to withstand a pressure of equal to 240 English pounds per square inch, after a lapse of six weeks.

It is stated that German cement is in considerable favour in the Chinese market, its price being lower than that of the English article. It is also incidentally remarked that unless the Chinese cement manufacture is developed on a much more important scale, there is ample scope for a considerable increase in the exports of cement from Germany to the Celestial Empire. The habitual cautious dealing of John Chinaman is illustrated by the advice given to German manufacturers in the remarks we are quoting to keep up the standard of their qualities, as the buyers in China make careful tests before purchasing cement.

A paragraph lately appeared in a Continental building journal, stating that a shipment of bricks had been received in London from Japan, which had been sold readily. The extreme hardness and sightly appearance of these bricks had got them into favour in the American market. The United States Government has now put a duty of 20 per cent. on these bricks, so there must be, it is supposed, a certain quantity available for exportation.

Method of Determining the Strength of Quarry Stones.—One of the leading Continental organs of the building trade calls attention to the possibility of arriving at the strength of stone without resorting to the troublesome and costly tests usually required to arrive at that result. Herr Müller, of Magdeburg, asserts that the strength of a stone is in a certain proportion to its specific gravity. As the latter point can be determined by a trial made on a small piece, it is suggested that with the tables of relative strength, there should be no difficulty in getting at the result required. The following calculations of specific gravity and weight at which demolition takes place are appended to the remarks we have quoted:—

LIMESTONE.

Specific gravity.	Weight in pounds per square inch.
1·500	711·15
1·700	1422·30
1·900	2133·45
2·100	2844·60
2·250	4266·90
2·350	5689·20
2·450	8533·80
2·600	14223·00
2·650	19912·20
2·700	25601·40

SANDSTONE.

1·870	2133·45
1·950	2844·60
2·050	4266·90
2·100	5689·20
2·200	8533·80
2·300	9956·10
2·570	12801·20

The strength of granite lies between the limits of about 5,000 lb. and 21,000 lb. per square inch, and that of porphyry between 13,000 lb. and 19,000 lb. per square inch, the specific gravity being between 2·5 and 3·0. The heaviest building stone is basalt, with specific gravity as high as 3·1 and a strength up to about 27,000 lb. per square inch.

THE DESTRUCTION OF THE ARCADIA THEATRE OF ST PETERSBURG.

THE St. Petersburg papers contain some particulars of interest respecting the fire which destroyed the above-mentioned theatre on the 4th instant. The "Arcadia" was situated in Novaia Derevnia, or New Village, and was a favourite suburban resort of the population of the Russian capital. The edifice was of wood, and the progress of the flames was terribly rapid. Though the most strenuous efforts were made to save the building, they were utterly fruitless, and the entire theatre, with its contents, was, in the space of twenty-five minutes, reduced to ashes. The fire broke out at two o'clock in the afternoon, while a rehearsal was going on within the building. The flames, however, did not originate inside the theatre, but at a spot outside, and the circumstances raised a strong suspicion that the conflagration was the work of an incendiary. Indeed, it is stated that during the fire a number of sheets of paper which fell near the neighbouring restaurant, *à la cascade*, were saturated with petroleum. The rapidity of the fire likewise convinced the authorities that there must have been a considerable quantity of highly inflammable materials lying in different parts of the building, and the police have, therefore, been carying on an inquiry with a view to detect the perpetrators of the supposed arson. The actors and actresses had barely time to get outside the theatre before the whole building was enveloped in flames. The wind carried the fire across to the restaurant, which was also completely destroyed. Not a bit of decoration, scenery, or costume could be saved. The only parts of the building not absolutely consumed were the iron fittings, which the fire left in a molten condition. None of the actors or actresses were injured, but the firemen were less fortunate. One man was suffocated, and two others received dangerous wounds from falling beams, and were nearly burnt to death. The total loss is estimated at 400,000 roubles of which only 80,000 roubles are covered by insurances. The latest reports state that one of the proprietor's relatives, who was some time since dismissed, has been arrested on suspicion of having maliciously set fire to the place. He had more than once been heard to use threats against the owner of the Arcadia. Further researches have already corroborated the suspicions against the arrested person.

VALUE OF BUILDING SITES IN THE CITY.

ON Wednesday Messrs. Fox & Bousfield let by Auction, at the Mart, Tokenhouse-yard, a number of building sites in Fore-street, on what is known as the Blackden Estate. The property was described as being situated between Moorgate-street and Cripplegate Church, and well adapted for the erection of warehouses, shops, and premises for wholesale and retail businesses of any description. The property was offered on building leases for terms of eighty years, one of the conditions of letting being that the lessee of each lot is to expend a certain amount named in new buildings on the site leased. It was stated that the materials on the ground of each lot would be included in the letting. There were six lots submitted, the first lot being 56 and 57, Fore-street, and 119 and 120, London-wall, and covering an area of 2,819 superficial feet. The auctioneer stated that 5,500*l.* was to be expended in new buildings on this site. The highest offer was a ground-rent of 980*l.* per annum, and the lot was withdrawn at 1,100*l.* The next lot, containing an area of 2,409 ft., consisted of 46, 47, and 48, Fore-street, having a frontage to that thoroughfare of 50 ft. The amount to be expended in new buildings was stated to be 4,500*l.* The lot was let at an annual ground-rent of 300*l.* Lot 3 consisted of a building site, being Nos. 42 and 43, Fore-street, and containing an area of 1,381 ft., with a frontage of 28 ft. This lot was let at an annual ground-rent of 180*l.*, the sum of 2,500*l.* to be expended in new buildings. Lot 4 comprised Nos. 38, 39, and 40, Fore-street, covering an area of 1,898 ft., with a frontage of 43 ft. 8 in. It was let at an annual ground-rent of 220*l.*, 3,000*l.* to be expended in new buildings. The next lot was described as a very valuable building site, consisting of Nos. 23, 24, 25, and 26, Fore-street, situate in the midst of the wholesale Manchester-markets, near the Midland goods station, and only a short distance from the proposed new station at the corner of Golden-lane and Barbican, in connexion with the Regent's Canal Railway. It contains an area of 3,852 ft., with a frontage of 73 ft. For this site, on which 7,000*l.* is to be expended in new buildings, there was much competition, and it was ultimately let at a ground-rent of 610*l.* per annum. The last lot, adjoining the preceding lot, contains an area of 9,222 ft., having a frontage of about 88 ft. to Fore-street, and was described as forming a fine site for the erection of a grand block of warehouse or manufacturing premises. The sum to be expended on this site in new buildings was announced to be 17,000*l.*, and it was let at an annual ground-rent of 900*l.* With one exception, all the sites offered were thus let, at an annual aggregate ground-rental of 2,210*l.*, the total amount to be expended in new buildings on the respective sites being 24,000*l.*

BUILDING ON THE KENSINGTON HOUSE ESTATE.

KENSINGTON House is being rapidly dismantled, and in the course of a few weeks will have been entirely cleared away, when the erection of the new mansions intended to be built on the site, and on the adjoining grounds, about seven acres in extent, will be at once commenced. There will be an approach-road from High-street, 45 ft. in width, to the central portion of the estate, which will be triangular in form, with roads, 40 ft. in width, on the east, west, and north sides, and another road of the same width, in the centre, running north and south. The estate will be laid out for the erection of seventy-five high-class residences, eight of which will stand upon the site at present occupied by Kensington House, with frontages to High-street and Kensington Gardens of 25 ft. 8 in. in extent. There will also be fifty-five houses, with 25 ft. frontages to the new roads on the east, west, and north sides of the estate, and fourteen houses facing the central road. A portion of the estate in the centre will be reserved as an open space, and ornamentally laid out as garden ground. The grounds extend westward a considerable distance beyond Kensington House, at the rear of the houses on the south side of High-street,

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and on a portion of the estate, at the north-west corner, stables will be erected for the use of the residents, which will be approached from a road off High-street. Similar stables will also be erected at the south-east angle.

The whole of the eight sites facing Kensington Gardens and High-street have been disposed of to parties who are about to build their own houses, the designs for which have been prepared by different architects. The owners of the estate will themselves commence the erection of forty houses as soon as the site is cleared. The designs for these houses have been prepared by the architect to the estate. They will be in the Old English style of architecture, faced with red brick and terra-cotta dressings and ornamentation. They will contain five floors, in addition to the basement, and will have extensive accommodation, each house having three spacious reception-rooms and thirteen bedrooms.

INTERIOR OF THE CHURCH OF SAINT FRONT, PÉRIGUEUX, FRANCE.

WE have recently spoken of the very handsome and valuable book, published as a memorial of the late Edmund Sharpe, and which illustrates and treats of the remarkable bevy of churches erected in the department of Charente. The first of such churches, although not illustrated in the volume referred to, is that of St. Front, Périgueux, and we have thought we should interest many of our readers by giving a view of the interior of this remarkable building, which has been recently restored. We will not now stop to discuss the way in which this has been done. In very early years we sketched the church both in and out, and we have an opinion on the subject. On the present occasion, however, our brief course is historical.

At the end of the tenth and the beginning of the eleventh century, a large number of emigrants from Venice formed a colony in the centre of France, and brought with them the arts and the taste of their country. The Church of St. Mark, at Venice, commenced A.D. 977, had just then been completed, itself prompted by St. Sophia at Constantinople. The French artists and artisans, excited by the accounts of the marvels of St. Mark's, sought to erect a monument of the same kind when Bishop Frotaire, then in Périgord, sought to raise a building which should be the finest thing in the country. St. Front was commenced about the year 985, and it is known that in the year 1000, money having failed, the Countess Emma de Périgord built the absis of the church.

The church at Angoulême, and some others illustrated in the book to which we have referred, followed St. Front in arrangement, the main feature of which is a central cupola carried on Byzantine pendentives, and with another cupola surmounting each of the four arms of the cross, the plan being practically the Greek cross.

The restoration of St. Front, which has been going on during a number of years, has been effected under the direction of M. Abadie, the diocesan architect.

LITTLEHAMPTON WATERWORKS.

IN 1876 the Local Board of Health of Littlehampton, Sussex, determined to adopt means of supplying the town with water, and thereupon took steps to get the proper authority from the Local Government Board for the purpose. The town is situate on the south coast of Sussex, between Worthing on the east and Chichester on the west, and four miles south of Arundel. It contains at present a population of about 4,000, and is bounded on the west by the river Arun.

Hitherto, although well situated as a watering place, it has remained stationary as regards facilities for buildings and accommodation for sea-side visitors. Since 1876 the authority has been roused into a state of activity and energy, and aided by the liberality of the Duke of Norfolk, has now established waterworks and a system of sewerage, both of which were much needed in order to develop the attractions of the town as a healthy sea-side place.

The facilities that are promised by railway intercourse with London and Portsmouth, and all along the South Coast and the beautiful scenery about Arundel, must attract to it not only residents in the neighbourhood, but visitors from afar. The intercourse with the Continent will, no doubt, be increased, and measures will probably be taken at no great distance of time to form wharfs and quays, and possibly for the construction of a floating dock, for which there are great facilities in the river Arun, by the side of the town.

The Local Board, having determined to provide the present population with water, acting under the advice of Messrs. Grantham & Son, engineers, sank a well, 6 ft. in diameter and 60 ft. deep, into the chalk on the ridge of land on the north side of the town parallel to the sea, and about half a mile from it. The well was sunk through brick earth and sand about 30 ft., and the remainder through chalk. It was lined with cast-iron cylinders to a depth of 60 ft. From the bottom of the well a boring was made 9 in. in diameter, with the view of procuring soft water from the green sand, but after proceeding 500 ft. from the surface, the Board was advised to discontinue the boring. In sinking the well a stratum of chalk, containing flints in irregular layers, was passed through, containing water, and it was found that the general strata of the chalk inclined from the high ground on the north towards the sea on the south. The Board, having given up further boring, was advised to sink another well, also 6 ft. in diameter and about 80 ft. deep, and 12 ft. from the first well, but communicating at the bottom with it. From the bottom of the second well two adits or headings were driven across the dip of the chalk for an aggregate length of 76 yards. These headings are shown on the ground plan. They intercept the water in the crevices, and will furnish a sufficient supply for the present population, and afford the means of a future extension.

Upon the completion of these wells and headings the Local Authority entered into contracts for the construction of a tower upon which a cast-iron tank was placed, covered with an iron roof, and surrounded by a gallery to facilitate the painting and repair of the tank. The first stone was laid by the Duke of Norfolk on August 14th, 1880. The tower is built of brickwork to the height of 61 ft. from the surface of the ground. A vertical section of the tower and engine-house are represented, together with the ground-plan, in the plate. The section shows the tank, roof, and staircase to the top. The height of the tower is sufficient to supply water to the tops of all houses on the highest ground in the town. The tank is estimated to contain 80,000 gallons of water, which is pumped up a 10-in. rising main, by a single engine and boiler of 14-horse power, a total lift of 140 ft. Double-acting pumps are placed in the well first sunk, which can be pumped dry in order to examine them, the water being shut out from the bottom by means of a valve worked from the surface.

The pipes for distributing the water have been laid all through the streets of the town, and are provided with the necessary hydrants, sluices, stopcocks, &c.

As the sewerage has been referred to in this paper, it may be stated that the system of sewers has been laid all through the town, having an outfall into the Arun beyond the pier-head.

The contractor for the water-pipes was Mr. Hayter, of Portsmouth. Mr. C. Chamberlain constructed the tower and roof, and Messrs. Laidlaw, of Glasgow, undertook the contract work of erecting the engine, pumps, and tank. Mr. W. Burns was the resident engineer.

TIMBER IN THE CONSTRUCTION OF CHURCHES.

HOLY TRINITY, GEDNEY HILL, LINCOLNSHIRE.

WITH this issue we present our readers with a drawing of a timber church, or, rather, of a church with a timber interior, and in doing so we would offer a few remarks upon works of this kind. It is rather noticeable that in a country like this, where large forests existed from the earliest days, timber was so little used in the construction of churches by the Mediæval builders. That stone was the material most generally adopted, if not altogether exclusively, was owing, doubtless, to the remembrance of the early Saxon churches having been pillaged and burned, and the determination of the architects of that period to adopt a material more capable of resisting those attacks in future. Still, however, we have some examples in various parts of the country, showing how wood was used late in the fourteenth and fifteenth centuries, and the durability of it is proved by the condition of the work in the present day. These works may be divided into two classes,—first, where wood was used entirely; and second, where it was combined with stone. Of the first of this kind there are examples at Berford, in Worcestershire, a very charming example of ancient carpentry, with some good fittings inside. This is framed, after the manner of the conntry, with strong timber uprights, framed into a cill, and resting upon a stone plinth. A similar arrangement exists at Marton, in Cheshire, a small and picturesque building, consisting of a nave and chancel, with south porch, covered with low-pitched roofs, and surmounted by a simple bell-cote at the west end. These walls are of solid timber uprights, probably 9 in. or 10 in. square, and about 1 ft. apart, with massive oak cills, resting on a chamfered stone plinth. The general aspect is pleasing, but can scarcely be dignified by the name of architecture. A much larger and more important church, which has been recently restored, that of Little Peoven, in the same county, has a nave and aisles, chancel, and small porch, and was built in the first part of the fifteenth century. It is of solid timber framework, with simple square-headed windows, having cinquefoiled tracery. The interior is much more striking in character than the exterior, and the effect of the octagonal columns or pillars, with the arched braces forming the north and south arcades, and the curved braces to the tie-beams of the roof, is admirable.

Of the second class of churches, our illustration from Gedney Hill, in the south of Lincolnshire, forms a good example. Here we have outer walls and windows of stone, together with a somewhat massive tower of the same material, with only the *internal* work of oak. The posts or pillars between the nave and aisles are solid and good, and rest upon stone plinths. These posts carry the longitudinal beams, and with them are framed tie-beams. Here, again, the arched braces to the posts, &c., produce a charming effect, and reminds one almost of the wooden walls of old England. The roof is flat,—little more than a square pitch. There is no chancel-arch, but a good screen separates the chancel from the nave. It is altogether in good and substantial repair, having been restored some years ago, under the direction of Mr. James Fowler, of Louth. At this time it was whitewashed throughout, and fitted with the usual box pews. These have now given place to open seats of a better character. There are numerous other churches of the same character throughout the country, but those named will be sufficient to illustrate our remarks, and, we hope, will draw attention to an interesting class of buildings. For mission rooms and small country chapels it is a question whether, in our woodland districts, and where stone is a scarce and costly article, this style of work might not be revived, as it is at once simple and inexpensive. There cannot be a doubt as to the picturesque form such buildings might assume, and so add to the beautiful objects for which our country is so greatly celebrated.

HARPUR TRUST.

APPLICATIONS and testimonials were received from between 90 and 100 candidates, in response to the advertisements in our own and other journals for a Surveyor to the London Estate of the Harpur Trust. This estate comprises part of Bedford-row and a number of streets in the neighbourhood, stretching, at the north-west, nearly to Queen-square. The income is mainly devoted to the support of the schools at Bedford, Sir William Harpur's native place. The committee appointed for the purpose selected six candidates deemed best fitted for the office, and the election by the Governors took place at Bedford on the 13th inst. The choice fell upon Messrs. Lander & Bedells, the final vote giving them a majority of four over Mr. S. Flint Clarkson, of 36, Great Ormond-street.

Egypt.—Mr. Jas. Wyld, of Charing-cross, is at once to the fore, of course, and supplies a clear and apparently careful plan of Alexandria, and a map of the Isthmus of Suez and Lower Egypt. At the present moment they can but be prized.

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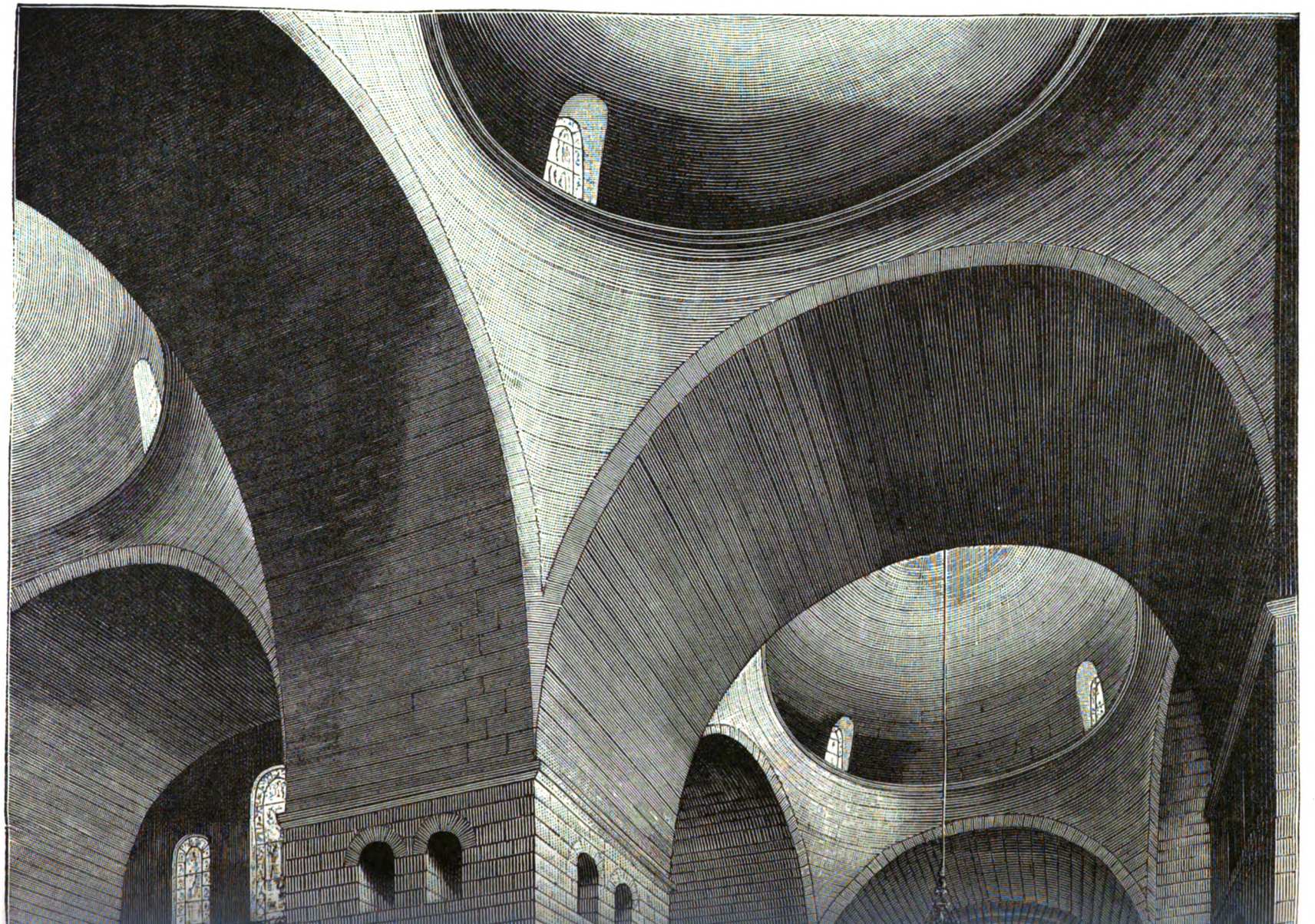

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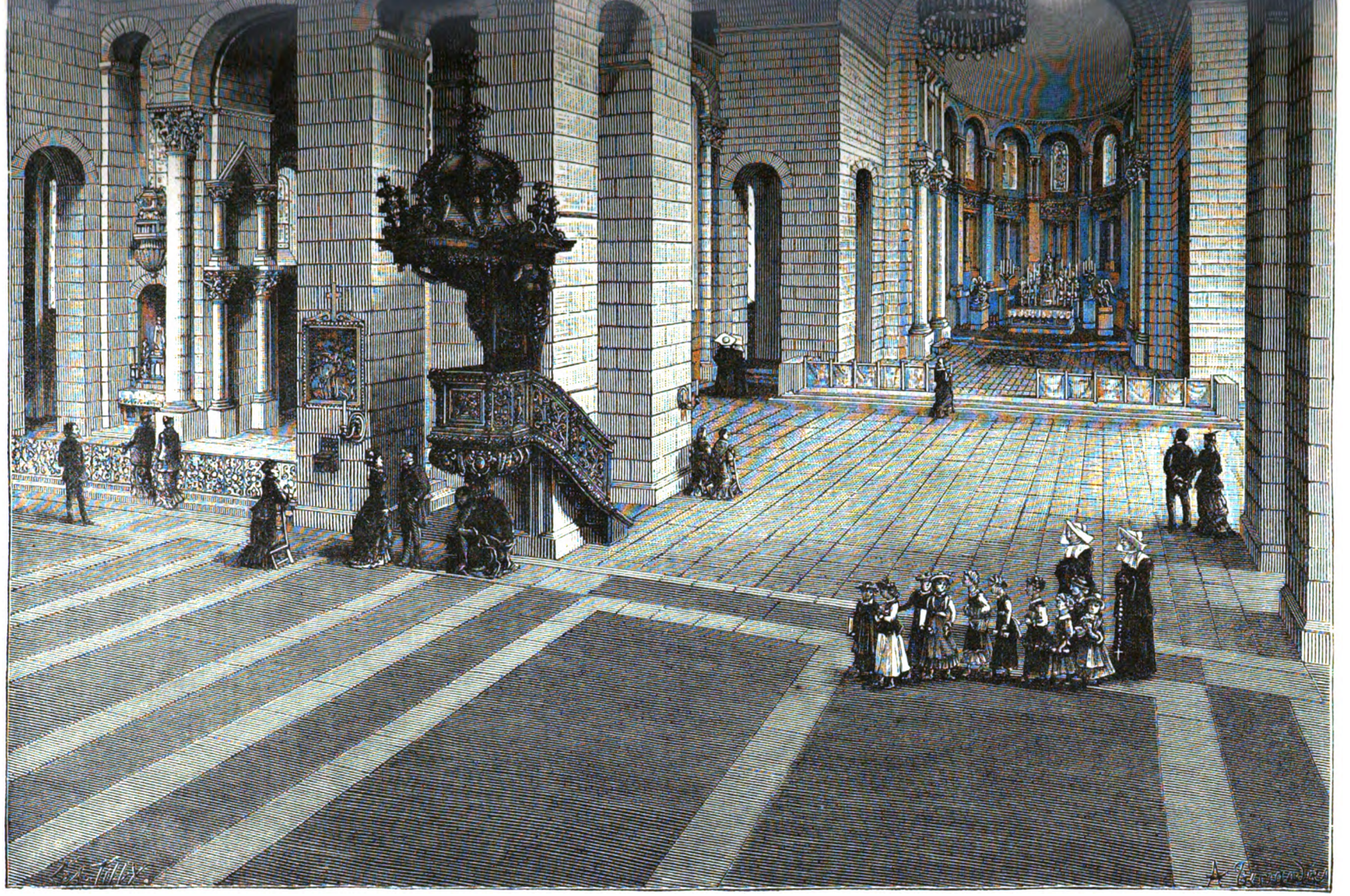

INTERIOR OF THE CHURCH OF SAINT FRONT DE PÉRIGUEUX, FRANCE: AS RESTORED.

THE ORIGINAL CHURCH WAS CONSECRATED A.D. 1047.

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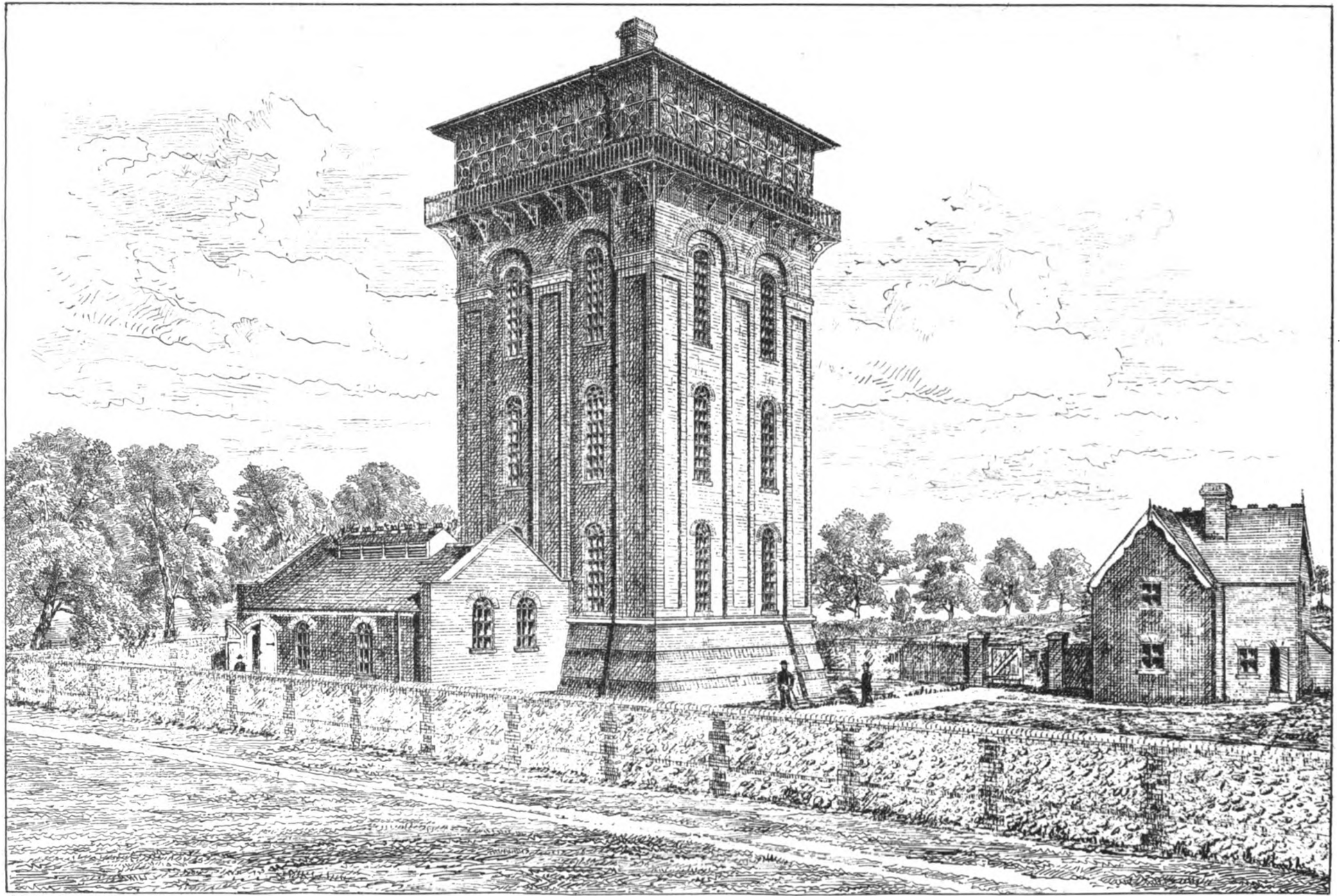

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LITTLEHAMPTON WATERWORKS.—MESSRS. GRANTHAM & SON, ENGINEERS.

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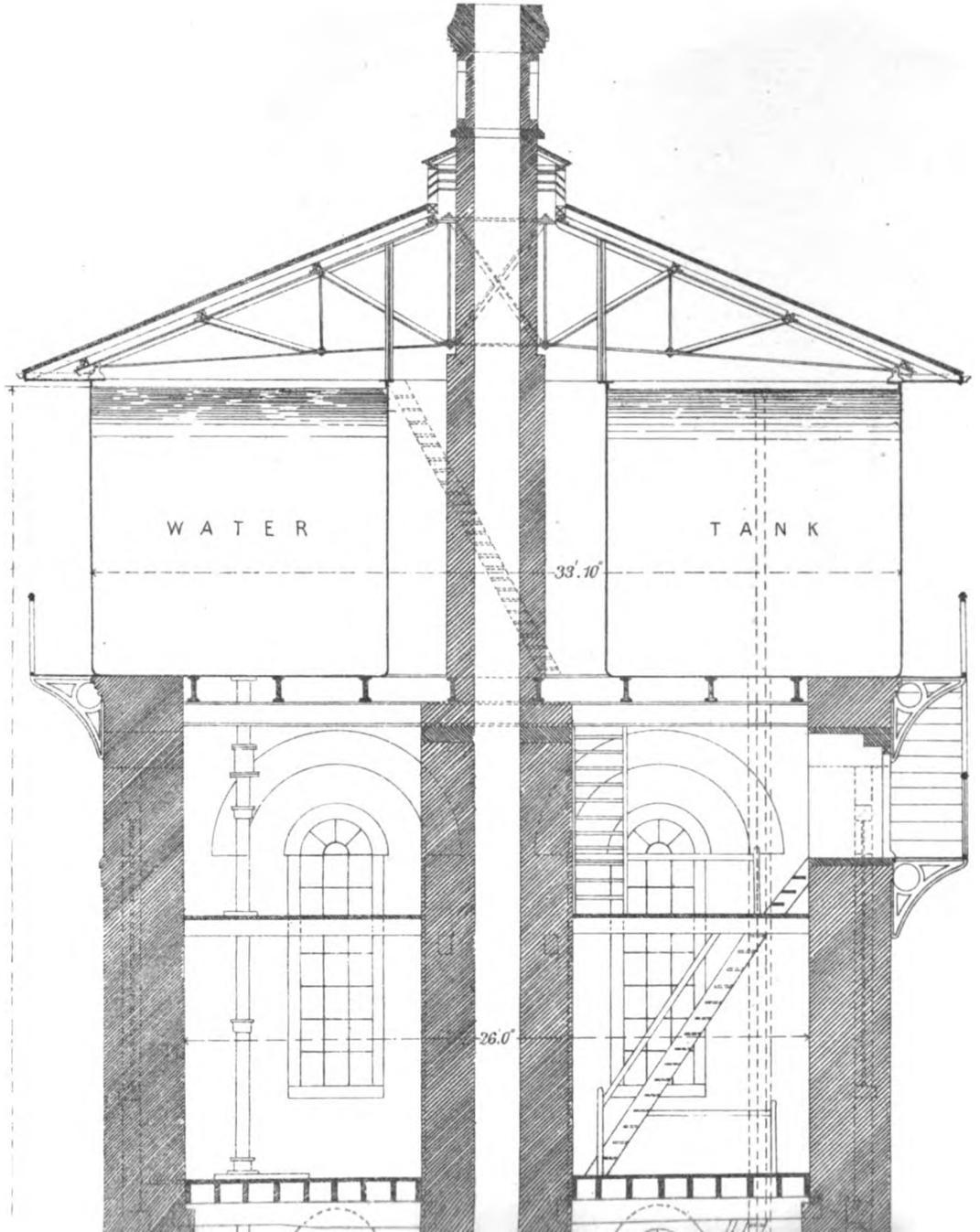

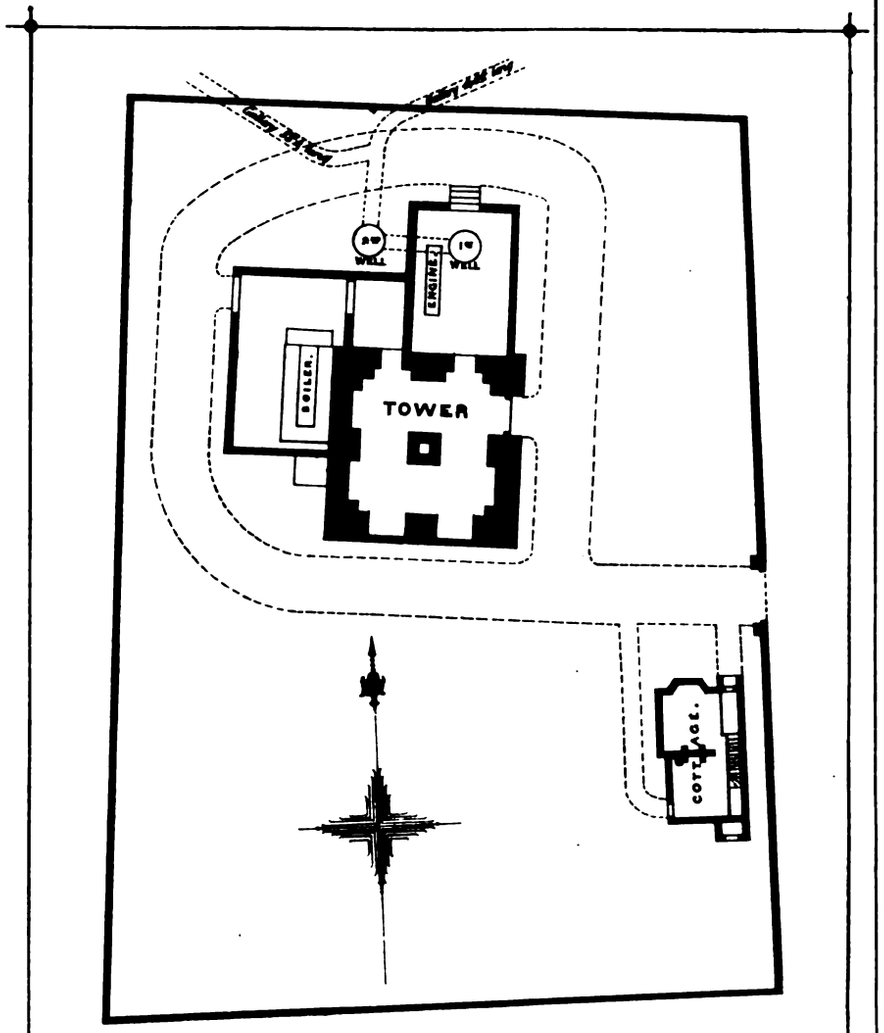

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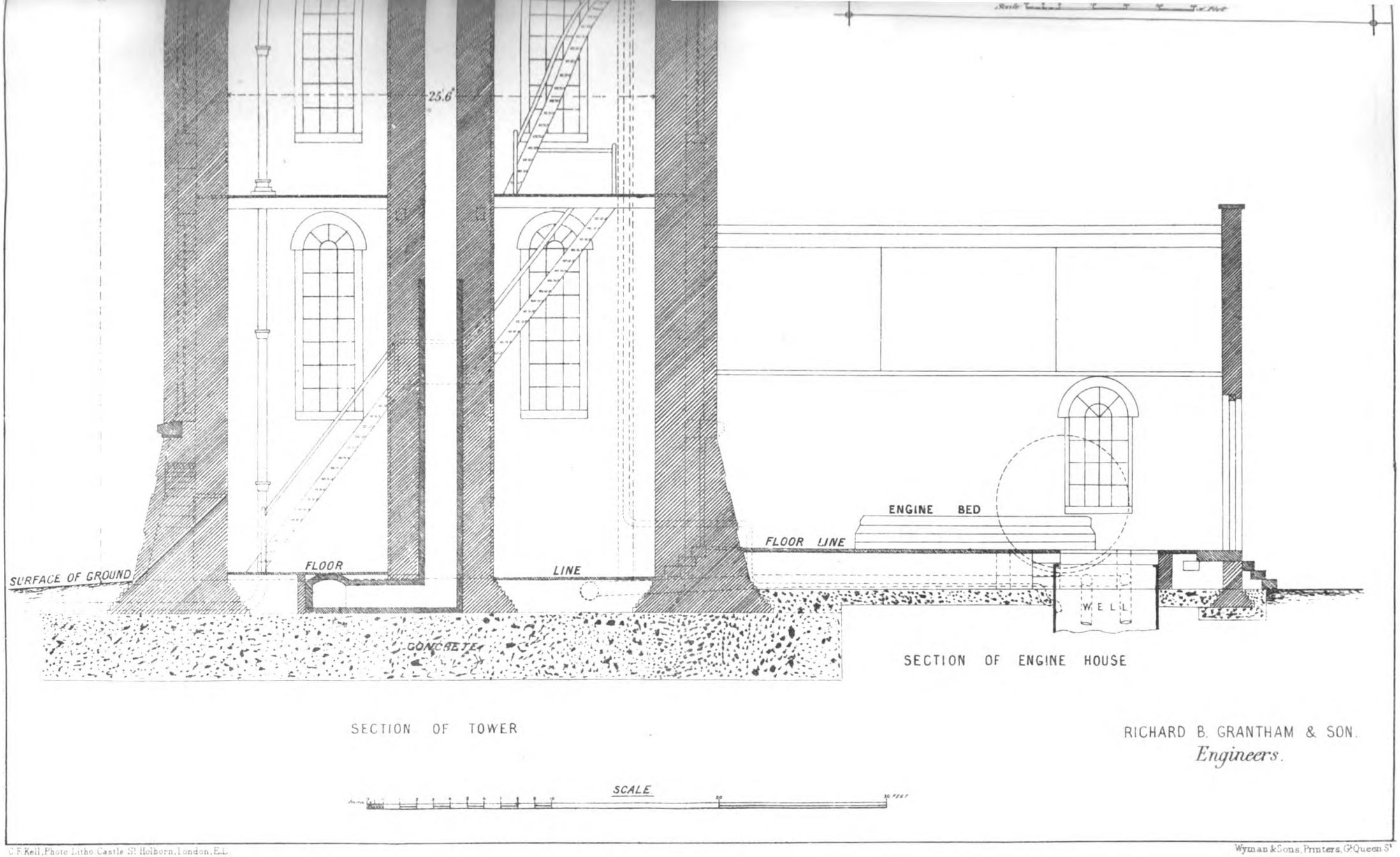

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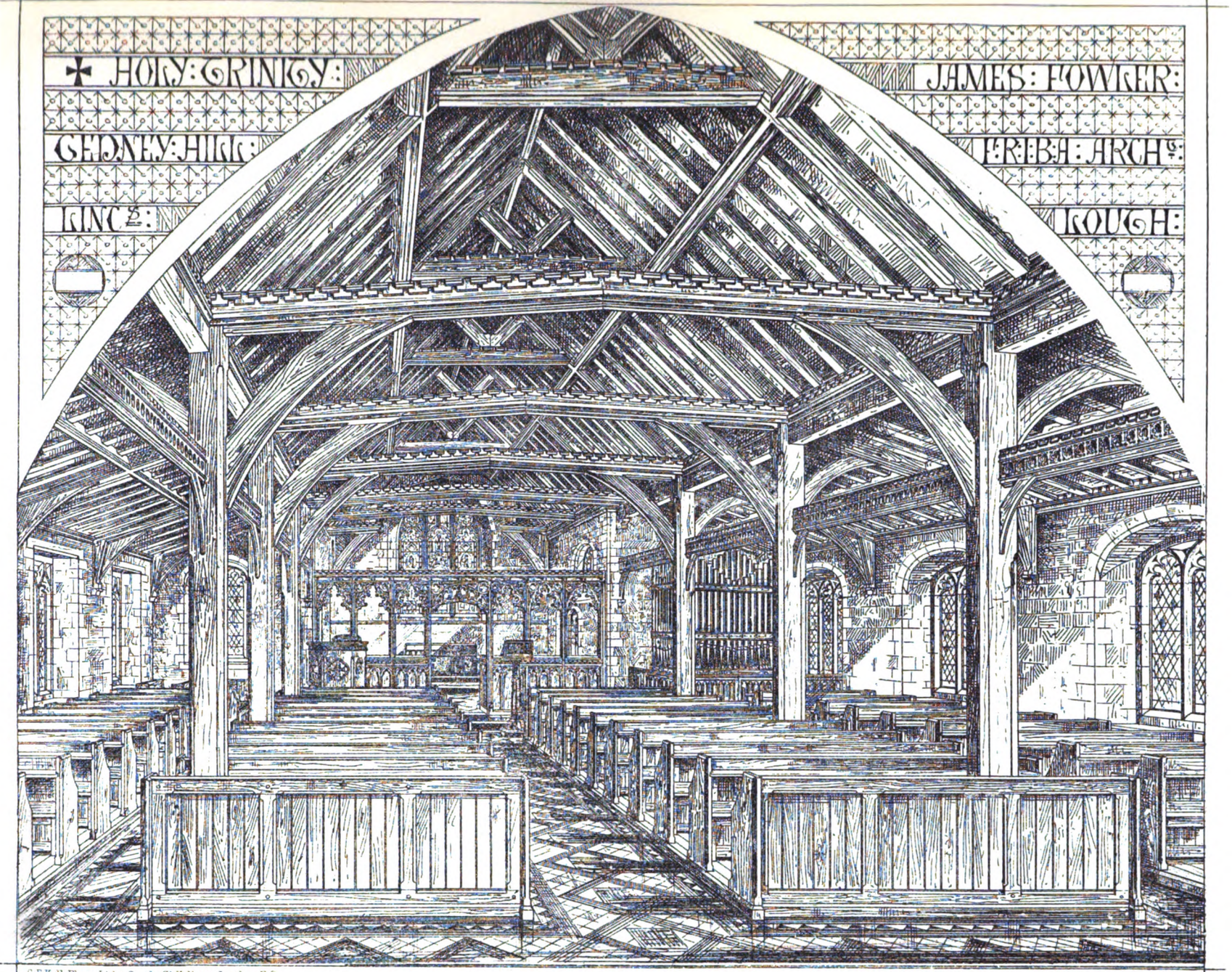

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ANNUAL MEETING OF THE ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.

THIS Association held its twelfth annual meeting in London on the 29th and 30th ult. and the 1st inst., the last of the three days being devoted to visiting several places of interest in the metropolis. On the two former days the meeting was held in the lecture-hall of the Institution of Civil Engineers, Great George-street, Westminster. There was a fairly numerous attendance of members representing towns all over the kingdom, from Southampton and Exeter to Carlisle and Newcastle.

Mr. W. S. Till, the borough engineer of Birmingham, last year's president, presided at the commencement, and after the transaction of some routine business, introduced

Mr. C. Jones, of Ealing, the president elect, who at once read his inaugural address, in which he alluded to the questions of sewer ventilation, of by-laws and the staff necessary to secure their being carried out, which might be provided for by the payment of fees by builders. The power to charge fees, he considered, was necessary if the by-laws were to be carried out, and he expressed his gratification that West Ham had, by the persistent energy of the Association's first president, Mr. Lewis Angell, obtained this concession during the present session. He also expressed a hope that some independent member of Parliament would bring in a Bill to confer this power upon sanitary authorities generally. The Local Government Board would offer no opposition to such a clause, although they would not themselves introduce it.

Mr. Lemon moved a vote of thanks to the President for his address. He agreed with the President that the by-laws ought to be enforced, and thought that the duty of taking proceedings against any one who infringed them should rest with the officers of the department concerned, and not with a committee, and as a precedent for this he quoted the district surveyors of the metropolis. Mr. Lemon also dwelt on the necessity of providing surveyors with larger staffs if supervision of buildings was to be carried out properly, and stated that, although under their by-laws it was his duty to give a certificate that a house was completed in accordance with the by-laws, he had never given that certificate yet, and never meant to do so, because he never could get his Corporation to give him sufficient assistance to see that all the by-laws were properly carried out by the builders.

Mr. Angell seconded the vote of thanks, and stated that they had hitherto refused at West Ham to adopt the model by-laws,—though very much urged to do so by the Local Government Board,—because it would be unwise to adopt rules that could not be carried out without a large staff, unless the Local Government Board gave them the means of providing the staff. As West Ham had now the power to charge fees on buildings which would provide for the payment of building inspectors, they would immediately proceed to appoint inspectors, and he hoped to carry out the by-laws efficiently.

Mr. Lobley expressed his pleasure at finding that the President had given very good reasons for a single system of sewers to a certain extent, and that he was not too strong in the modern gospel of a separate system. The value of rain water in cleansing drains was very great, and ought not to be thrown away.

Mr. Gordon thought if they had a paper on the separate system it would be well to invite the medical officers of health to take part in the discussion.

Mr. Parry spoke of the separate system as carried out at Reading, and

Mr. Jerram urged that it would be mischievous to carry out the separate system in every house.

Mr. Spencer said the question of certificates was a difficult one. For many years he had refused to give certificates, but of late he had, like Mr. Lobley, given a qualified certificate, that was to say, that the house drainage was completed, so far as he knew, to his satisfaction.

Mr. McKie believed that the secret of sewer ventilation was to keep it moving. As to certificates, it was his custom when everything had been carried out according to the deposited plans, so far as could be seen, to give a certificate that there was sufficient open space to the houses.

Mr. Reid, citing in proof the drainage of Gloucester, thought that often when smells were complained of as coming from the ventilators, the smells were due not so much to the ventilated sewers as to old ones which they took up, or to house-drains.

Mr. H. O. Smith's experience was that there was nothing like a continuous flow and constant flushing.

Mr. White coincided with the remarks of the last two speakers.

The motion was then put and carried unanimously, as was also a cordial vote of thanks to Mr. Till, the outgoing president.

Mr. H. O. Smith then read a paper on the 152nd section of the Public Health Act, 1875, and the dedication of private streets as affected by Sir George Jessel's decision in the case, The Attorney-General (at relation of West Ham Local Board) *v.* Bidder and Others.

A long and interesting discussion followed, and a vote of thanks was accorded to the author of the paper.

On Friday morning Mr. Hanson exhibited to the members his automatic sewage-machine, worked by the flow of the sewage from the main outfall, and automatically regulating the quantity of chemicals added to the sewage. He claimed for the machine that it saved labour, regulated the addition of chemicals, and provided for the effectual agitation of the chemicals and the sewage. The machine is to be seen in operation at Wakefield. A number of questions having been asked and replied to, a vote of thanks was accorded to Mr. Hanson.

Mr. Sugg then read a paper on "Gas as an illuminating Agent compared with Electricity." Laying down the principle that artificial lighting must be a prolongation of the light of day, he contended that gas properly used fulfilled this condition, and pointed to the lighting of the House of Commons and of Reading Town-hall as proofs of this statement. The only adverse criticism on the lighting of the latter was by a gentleman connected with architecture, who gave it as his opinion that the gas-lighting was a failure because it was so exactly like daylight. He believed the advantages of gas to be much too great for it to be superseded by the electric system at any time.

Mr. Shoolbred then read a paper dealing chiefly with the rules recommended by the Society of Telegraphic Engineers and of Electricians for the prevention of fire risks and dangers to life in connexion with electric lighting.

Mr. Parry, the borough engineer of Reading, confirmed the statement in Mr. Sugg's paper as to the success of the system of gas-lighting adopted in the Town-hall of Reading.

Mr. Lemon attributed the recent improvement of gas-lighting to the introduction of the electric light, and expressed his pleasure at the existence of a competition between two different systems of lighting.

Mr. Angell said that his experience of gas companies had not prejudiced him in their favour, but he was nevertheless of opinion that gas possessed great advantages over electricity for general street-lighting. But he thought the electric light well adapted for docks, lighthouses, and railway stations.

Mr. Spice, at the request of the president, spoke, confining his remarks chiefly to commenting unfavourably upon the tone of Edison's latest work on the question.

Mr. Sugg and Mr. Shoolbred replied to a vote of thanks which had been unanimously passed, and in doing so answered a great number of questions on points of detail which had been put by various members of the association, among whom were Messrs. Escott, Lobley, Spencer, McKie, and Eayrs.

Mr. Jerram (Walthamstow) next read a paper on "Sanitary Legislation." The paper dealt with various defects which experience of its working has proved to exist in the Public Health Act, and suggested that the Council should take the matter into consideration with a view to taking action to get these amended.

The President, Mr. Angell, Mr. Lemon, Mr. Gordon, Mr. McKie, and Mr. Reid took part in the discussion which followed, and ultimately it was arranged that, the subject being too important to be properly dealt with in the time left for discussion, the paper should be brought up for consideration at each of the district meetings during the year, the district secretaries being requested to communicate the result of the discussions to the Council to guide it in taking such action as might be deemed desirable.

The proceedings concluded with a vote of thanks to the President, moved by Mr. Pritchard and seconded by Mr. White.

In the evening the members made an inspection of the headquarters of the Metropolitan Fire Brigade, and on the following morning visits were paid to Messrs. Doulton's works, and to the House of Commons, where the ventilating arrangements were inspected, and a limited number of the members ascended the Clock Tower to inspect the works of the great clock.

In accordance with a resolution moved by the President on Friday morning, the next annual meeting of the Association will be held at Oxford, and the following year it will probably be held at Newcastle.

THE AUTHORISED NEW RAILWAYS OF THE SESSION.

THE METROPOLITAN OUTER CIRCLE.—WATERLOO AND CHARING CROSS.—MERSEY AND SOUTHPORT EXTENSION LINES.

THE labours of the Parliamentary committees in the investigation of railway and other Bills which have been promoted during the present session are now fast drawing to a close, and amongst other undertakings which have received the sanction of both Houses within the last few days one of the most important is the Metropolitan Outer Circle project, under which it is proposed to construct a railway belt of about twenty-five miles in length, stretching around the country on the north side of London, from Acton and Ealing on the west, to the Royal Albert Docks on the east side. The line will commence by junctions with the Great Western and Metropolitan District railways, near Ealing, and from this point it will proceed for some miles in a northerly direction, passing through the parishes of Twyford (in Middlesex), Willesden, Harrow-on-the-Hill, and Kingsbury, and intersecting in its course the London and North-Western and the Metropolitan lines. The course of the line is thence north-east in the direction of Finchley and Hendon, where it crosses the Midland line, and continuing eastward it intersects the Great Northern Railway a short distance northward of the Alexandra Palace. From this point the line is continued for about four miles due east, passing through the parishes of Edmonton and Tottenham, and twice crossing sections of the Great Eastern Railway, and also passing over the river Lea. The course of the line is then south-east, through Walthamstow, Snaresbrook, and Wanstead, the railway immediately skirting the south end of Epping Forest, where the sections of the Great Eastern Railway, on the east and west sides of the Forest, are intersected. The line from this point proceeds directly south to its terminus at the Albert and Victoria Docks, passing through Ilford, Manor Park, Barking, and East Ham. A prominent feature of the undertaking is the effecting of junctions with the Great Western, London and North-Western, Midland, Great Northern, Great Eastern, and London, Tilbury, and Southend Railways, so as to provide for an interchange of traffic with all those several lines.

The Bill authorising the construction of a railway from near Waterloo Station, under the Thames, to Northumberland-avenue, to be worked by electricity, has also finally passed both Houses.

The Mersey Railway Bill, and the Southport and Cheshire Lines Extension Bill, both of which were strongly opposed before the committees of the Commons and Lords, were both sanctioned last week by the Lords' Committee, after having previously been passed by the Commons. The opposition to both these projects was grounded on the alleged great injury which their execution would do to buildings and other property in the localities affected. The Corporation of Birkenhead were the principal opponents to the Mersey Railway Bill, and they alleged that the railway and its working would injure the streets, and shake the town-hall and other buildings. The Corporation further opposed the Bill on the ground that the railway in connexion with the tunnel under the Mersey would destroy the steamboat ferry traffic between Liverpool and Birkenhead, on the security of which the Corporation had based their municipal debt. The Bill was, however, passed, a condition being that the railway company are to pay the Corporation the sum of 50,000*l.* in compensation, 20,000*l.* to be paid on the completion and opening of the line,

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and the remaining amount by six annual payments of 5,000*l.* each.

The Southport and Cheshire Lines Company's Bill was for powers to extend to Southport their already authorised line from Liverpool to Birkdale, which is about a mile from Southport. In connexion with the undertaking the company propose to construct a park, 47 acres in extent, between the proposed railway and the houses facing the shore. A large number of witnesses were called both in favour of and against the Bill, many of them surveyors and engineers. The evidence against the Bill was to the effect that the construction of the line would very seriously depreciate the value of house property in the neighbourhood which the line would pass, several owners of which had spent sums varying from 7,000*l.* to 10,000*l.* in the erection of their houses. It was also urged that the houses were not built on any very firm foundation, and that the vibration from the railway would endanger their stability. In the result the Bill was passed, the committee stipulating that the park and recreation-ground were to be well laid out and maintained by the railway company, and that ample access must be provided across it to the shore.

THE ARCHITECT AND SANITARY SCIENCE.

IN the course of the address made at the Royal Institution, on Tuesday, the 11th, mentioned in our last, Mr. E. C. Robins said,—Dr. Frankland's investigations have proved that when water contains foul matter for any length of time decomposition takes place in water, and the surrounding air is contaminated by the bubbles of gas generated, breaking and releasing the infectious particles along with it, and thus it is that the architect learns, what he never would have discovered for himself, the necessity of devising means for the ventilation or disconnexion, by air as well as by water, of the house-drains from the main sewer, which has led to the introduction of ventilating-traps, and of intercepting cross-current air-ventilated manholes to house-drains, even where water-traps exist, to obviate the fatal consequences likely to ensue where neither air nor water traps or manholes exist, which, nevertheless, is still the case in the great majority of dwelling-houses in the land.

Through the influence, therefore, of sanitary science, as we understand it, mechanical contrivances have been devised whereby, as Professor Corfield puts it, "a house may be brought into such a condition of safety, that we can say with perfect certainty that if typhoid poison is in the main sewer it will not get into the house; and further, that if typhoid fever is taken into the house, when such preventive measures are taken, it will not spread."

But this sound principle is not only applicable to drainage; it is most important to remember it in water-supply. Thus, sanitary science, having first revealed the ready absorption by water of bad gases, mechanical means have been devised by practical sanitarians to prevent the drinking-water in our cisterns and wells from becoming contaminated. It was, and still is, common to find the only supply cistern fixed over the closets for the convenience of having the ball-levers and service-boxes in the same for their supply, and the trumpet-shaped overflow waste-pipe, untrapped, was fixed in direct communication with the soil-drains,—through which sewer-air was laid on to the surface of the drinking-water, to be absorbed by it, and to poison the unconscious family drinking the same. All this is being amended now. Separate cisterns are provided for drinking-water. No water can be drawn from those supplying the closets. Every cistern waste discharges into the open air over a trapped gully grating. Galvanised iron or slate cisterns are preferred to lead, and tin-lined lead-pipes serving the various supply-taps.

Professor de Chaumont assures us that parallel with the progress of medicine and the collateral sciences advances have been made in sanitary science which amount to important revelations, so that it has become possible to lay down certain principles which are capable of practical application to the great advantage of us all. In short, the ablest medical and sanitary authorities have decided that by good sanitary appliances and surroundings, resulting in the maintenance of the purity of the air within and around our dwellings, typhoid fever, diphtheria, sore throat, and cholera might be rendered exceptional diseases, instead of being, as they now are, the fruitful sources of illness and death, to the alarming extent of one-third of the whole mortality of the United Kingdom.

In further illustration of the uses of sanitary science, as it has been formulated by the experimental researches of professors of physics, chemistry, and hygiene, the popularisation of which researches is the special work of this Institute, let me detail to you the experiments of Dr. Pettenkofer and Dr. Renk at the Hygienic Institution at Munich. Dr. Renk, in a letter promising to send me a pamphlet (in which he has laid down his opinion of sewer gases and the hygienic estimation of them, also some hints how to keep them out of our houses in a better way than has been done hitherto), proceeds to give me a description of his experiments on "the entrance of ground air into houses." By means of a differential manometer, invented by Recknagel, he discovered that, in a house at Munich, the air in the ground beneath the paving of the cellars was always under a higher pressure than the air of the cellar itself, from which result he inferred that the ground air is always in motion from the soil into the house,—the pavement being bricks laid in mortar was permeable by air. This higher pressure of the air under the house he found was caused by the wind and by the difference in temperature between the inside and the outside of the house.

It happened that in and under the cellar paving a draught channel for ventilating purposes was situated, being constructed of bricks and mortar, and covered with stone slabs. The channel was connected with the chimney of the boiler which generated the steam for the heating apparatus. This draught channel had a very great influence on the ground air to a distance of six yards from its walls, and the ground air was more attracted by the current of air passing through the draught channel than by the air in the basement of the house. Moreover, the air of the cellar was, in like manner, for a certain distance from it, drawn into the same draught channel current, and with increasing rapidity the nearer it approached the channel.

This experiment suggested to Dr. Renk a means of keeping ground air out of houses,—that is, by permeable tubes connected with the chimney of the kitchen fire, up the flue of which a constant current is being kept up, thereby a sufficient draught is created to withdraw the ground air from the soil and carry it above the roofs.

In connexion with these experiments were others illustrating its passage through walls of houses of different materials, upon which tables of data are derived, and which give to the architect and engineer the means of calculating the degree of permeability for air that the materials he employs possess.

It is my practice to avoid boarded floors on basements, and the air spaces under them required to prevent dry rot. It is better to cover the whole area of the ground covered by the house with a layer of cement concrete 6 in. thick, which is practically impervious to air or moisture, and to lay thereon a wood block pavement formed of burnettised blocks, 7 in. by 3½ in. by 2 in. thick, with wrought edges and top surface, set in pitch and jointed with cement powder brushed into the interstices, and set with water.

The architect to the Ecclesiastical Commissioners, Mr. Ewan Christian, first suggested and carried out a plan for rendering walls impervious, by simply building the enclosing wall of a house with a hollow space of about an inch and pouring into the same liquid asphalte, thus forming a vertical damp course, rising from the horizontal asphalte damp course commonly laid in walls 3 in. above the level of the ground to prevent damp rising in the walls themselves.

So far we have been considering the helpfulness of sanitary science in relation to sewer gases, and the ventilation of drains, water-supply, and the withdrawal of ground air from the basements of houses. But when we have succeeded in ventilating our drains, water, and subsoil *out* of our houses instead of *into* them, we have still to consider, as I showed in my lecture at Eastbourne, on "The Revelations of Sanitary Science," how to maintain the purity of the rooms we inhabit, and defile with our own breathing, house-warming, lighting, and cooking.

To raise the standard of efficiency, qualifications of candidates for diplomas should not simply depend on the replies written or oral to a few test questions of the examining body, but by some evidence of preparatory study, as shown by previously-acquired certificates of elementary general competency.

The Conference of the Society of Arts, on Technical Education, of 1868, thus expressed itself:—

"Believing that our defects are far more due to the ignorance of those who direct works than to imperfect technical education, want of skill, or incapacity in those who execute them, we consider,—That with a view to the development of a system of scientific education, it is desirable that schools be established, having for their main object the teaching of science as a mental discipline. These science schools should prepare some youths for the higher courses of a college, and other less ambitious pupils for their professionnl pupilage."

Now, as I have elsewhere stated, in England all the best things are reserved for the upper ten thousand, and because a classical education was associated with a refined culture, therefore all our public and private schools became preparatory schools for the universities, as if the whole country consisted of noblemen and county families, to the entire neglect of the scientific necessities of the period.

The thorough mastery of any one branch of higher scientific education, to the extent to which the dead languages or pure mathematics is now carried in the universities, would be found a full and sufficient means of mental expansion, but the absence of efficient teachers to an equivalent extent will long stand in the way of such a development.

But I am happy to think that, contemporaneously with the spread of knowledge in sanitary matters in particular, has come a feeling of backwardness in technical education generally, and during the last five or ten years, science schools of the character suggested by the Conference of 1868 have been built, and are being erected throughout the country, by municipal authorities, as at Nottingham; by trade guilds, such as the City Companies of London and Bristol; and by private benevolence, of which Josiah Mason's College, at Birmingham, is an eminent example; so that very soon the means of obtaining technical information will be within the reach of every man worth his salt.

The proposed introduction into the ordinary curriculum of our primary schools of such elementary, scientific, and practical courses as may help towards the development of individual cleverness, by a general raising of the technical standards, and a selection of the fittest for higher training, cannot be otherwise than eminently desirable, and will leave no excuse for any candidate for examination being entirely without that preparative training which is, or should be, the aim of all test examinations to foster and encourage.

The recent establishment of compulsory examinations for admission to the Architects', Surveyors', and other Institutes, will certainly help to bring about a change in this matter, and soon it is to be hoped that, just as candidates for entry to the technical educational advantages to be hereafter obtained at the Central Institution of the City Guilds will be required to produce certificates of having passed preliminary examinations at other schools of lower grade, so admission to the examinations of our professional institutes should be ultimately given only to such students as shall be able to produce similar educational certificates of competency up to a certain point, which can only be fixed from time to time, as the means of obtaining such certificates shall have been increased. . . . . .

I may here observe that a chair of Hygiene is associated with some of the foreign universities.

In my recent tour of the technical schools on the Continent, I visited a very remarkable institution in Munich, founded by the king, and entirely under the control and management of Dr. Pettenkofer, one of the professors at the University, from whose plans it was built and fitted up in a sumptuous manner, replete with every apparatus and appliance. It is called the "Hygienische Institut," and I spent several hours with his chief assistant, Dr. Renk, by whom I was taken through the physical and chemical laboratories, and shown the various experiments on ground air, which I have already

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detailed to you, and which he had been two years in working out. It is to this institution that officers of health have to repair and complete their courses before being considered properly prepared to undertake responsible official positions in relation to the public health. And it would be a gratifying circumstance if, in the legislative enactments of this country, something besides the mere appointment of officers should be required; and that certificates of competency from an appointed tribunal should be required of all candidates for office under the Public Health and Nuisances Removal Acts. And it may not be too much to hope that, just as no district surveyor can be appointed under the Metropolitan Buildings Act unless he shall have first passed the compulsory examination entrusted to the Royal Institute of British Architects by that Act, so the certificate of the Sanitary Institute of Great Britain shall be, by law, required of all would-be officers of health.

2nd. This brings me to the consideration of some points in which sanitary legislation seems to need improvement. But first let me remark that it would be a very narrow view of the work of the Institute if it were to show towards others the same jealousy which it has deprecated in its own case. The Sanitary Institute should be ready to aid to its utmost all efforts for the improvement of the sanitary condition of the masses. There are many philanthropic schemes afloat which it should be the pleasure of this Institute to assist and encourage by its sympathy and advice, and otherwise as opportunity may occur, and by the personal co-operation of its members.

The National Health Society, the Ladies' Sanitary Association, the Parkes Museum, the Sanitary Protection Association, the Sanitary Assurance Association, &c.:—these societies have collected funds and formed valuable and influential coteries of the patrons and patronesses of sanitary work, whose hearts and whose purses are open to the appeal of those whose slender means would deprive them of the advantages of good sanitation, if it were not for the co-operative principle underlying the two latter societies' labours, and enabling them for a small fixed fee to give the professional advice required.

The fact that a few rich people, who could afford to pay for more elaborate reports and supervision, may also seek to obtain these advantages, ought not to influence our judgment of their general usefulness and value.

Mr. H. C. Stephens has shown, in an ably-written paper, the way in which the law, as it now stands, operates as an obstruction to sewage disposal. He has shown that under the Public Health Act of 1875, owners and occupiers derive rights which prevent local sanitary authorities from carrying out systems of drainage involving the *separation of the rainfall and surface water from sewage*. The bad effects of the present system have necessitated the appointment of a Royal Commission to consider if any and what steps can be taken to lessen the evils attendant on the present outfall arrangements of the metropolitan drainage.

The 10th clause of the abstract of Mr. Stephens's paper puts the matter clearly, thus:—"Though, under the 24th section of the Public Health Act, it is competent for local authorities, at the expense of the ratepayers, to alter or construct anew the drainage of houses, if such drainage is not adapted to the general sewage system of the district, there is, notwithstanding, no power in the Public Health Act, or elsewhere, enabling local authorities to decline to approve plans by which excreta and house-waste, with the rainfall combined, are shown to be received into carriers common to all."

So long as the rainfall accompanies the waste and soil drainage, so long will the impracticability of economically converting the latter into agricultural uses remain. Consequently, a sanitary measure of urgency and importance is rendered impracticable from rights arising under the Public Health Act.

The combined system of drainage dates from the Fire of London, after which it was first instituted. But, as London grows, the difficulties will increase, and are increasing, and sewers, forming elongated cesspools in dry weather, must increase in number, till the time comes when Prof. Corfield's suggestion will be the only cure remaining for great cities; that is to say, the old sewers shall be exclusively used for rainfall, and a new system of soil-drainage on the latest principles of sanitary science, with complete and constant flushing arrangements, automatic in action, shall be constructed.

The provisions of the Public Health Act should be broad enough to allow of the trial of this "separate system" on a smaller scale than will eventually become necessary.

Again, so long as we hold to any water-carriage system, and none is so readily adaptable to householders' uses, a good supply of water all the year round is an absolute necessity, whether it is constant or intermittent is of much less consequence than is commonly supposed. The enforced use of waste-preventers has so improved their manufacture, that a sufficient flush can be obtained in spite of their use, and the regulation of the size of the service-pipe from the cistern, in proportion to the height above the closets, will effect all that is required in a house.

But the influence of the Institute may be beneficially used in favour of the public, and especially the humbler portion of it, by getting a revision of the Water Companies Act, which has granted to them inquisitorial powers for self-aggrandisement quite inconsistent with public purposes of a sanitary nature. I do not enter into the question of the cost of the water, which should obviously bear some relation to the quantity supplied, and not rates and taxes; that is likely to be taken up more effectively by other bodies than this Institute. But I do contend that so long as a house is supplied by cisterns filled once a day, the water companies have no right to interfere in the use of that water so supplied. Where there is constant service, and no intervening cistern, it may be necessary to look to every point at which water may escape; but the inconvenience of leakage from high pressure is its own punishment for indiscretion in the use of imperfect apparatus.

As the case now stands, difficulties are thrown in the way of using water, the result of which is that an insufficient quantity is used for the purposes of a healthy water carriage of the excreta of dwelling-houses, rendering more than ever necessary the proper ventilation of sewers and drains.

Another, and a pressing want of the day is greater uniformity in the by-laws governing the action of local authorities. This subject has been well thrashed out at the Royal Institute of British Architects in London, as well as provincial architectural societies, and has been the subject of annual conferences, and is likely to be re-opened at the next conference of the Royal Institute.

The inconsistencies at present prevailing are very perplexing, and even the model by-laws of the Local Government Board are open to considerable improvement; but the subject is too large and technical to enter on at this time. One instance in my own practice is enough.

In Croydon I was required to make my house soil-drains 4 in. diameter, to enter 6-in. pipe sewers. In London we commonly use pipes 6 in. diameter. At Bristol, no drain from any single closet is allowed to be less than 9 in. diameter,—a difference of from 1 ft. to 4 ft. 6 in. in the sectional area for the same purpose, or nearly five times.

BRIGHTON.

THE contemplated Corporation improvements in the Madeira-road, under the eastern cliff at Brighton, suggested by Councillor Weston, are about to be brought into prominency and at once commenced. They will include sheltered seats under ornamental pavilions, facing a grass-covered slope leading to a raised terrace, with two glazed pavilions at the extreme ends, each 100 ft. long, the centres covered by a roof supported by cast-iron columns, the whole occupying 360 ft., made of asphalte. The roof projecting 4 ft. beyond the body of the building would form a terrace 15 ft. wide, and give an attractive feature, besides being a shelter, the cost of the scheme not exceeding 2,000*l.*, the whole being illuminated by the electric light. As the Kürsaal proposal, we are informed, is to be introduced again in the coming year, it is incumbent that the municipal authorities should adopt some project for the accommodation of visitors and invalids, and endeavour to reclaim the character of the place. Competitive designs have therefore been invited to include public baths, such as at Harrogate. The Mayor has announced that up to July 12, 7,377*l.* 18s. have been contributed or promised to the guarantee fund for circulating the vindication of the "slanders" on the sanitary condition of Brighton. The whole of the materials for the sheds and enclosures used at the Royal Agricultural Show in Preston Park have been sold by auction by Mr. Simmons, jun. (Simmons & Son).

THE EXMOUTH DOCKS.

FOR a long time the docks at Exmouth, which were opened in 1869, have been in a very dilapidated condition, and although not actually closed, were wholly unfitted to meet the business requirements which it was intended they should supply. But during the past two years, gradually though surely, a change has been taking place, until at last the time is fast approaching when the docks will once more be in a fit state to meet all the requirements of the shipping trade of the port, and further, be in a stronger and better condition than they ever were. Of the importance of the docks to the trade of Exmouth there can be no question, and for the satisfactory transformation in the state of affairs the townspeople have to thank the enterprise of Mr. G. Ellett, a gentleman who for nearly a quarter of a century has been intimately connected with the shipping trade, and whose knowledge and experience lead him to believe that, properly worked, Exmouth Docks will prove a financial success. The Exmouth Docks Act was obtained in 1864; previously to that the coals and other commodities brought to the town by water were landed on the beach or in the bend of the river near the station. In that year, however, a company was formed for the construction of a dock and jetty. The Act enabled the company to raise 60,000*l.* in 5*l.* shares, and 15,000*l.* in debenture shares. It further gave them very considerable powers. The company commenced the building of the present docks, and acquired at the same time a large extent of ground adjoining, suitable for stores and business premises. In April, 1869, the docks were formally opened for traffic; but, as already stated, before they were actually in use misfortune came upon them, for a considerable portion of the wall facing the gates gave indications of shifting, and had to be secured by the aid of wooden piles. When opened, only about 450 ft. of the dock, on the side nearest the town, was available as a quay, and this was connected with the railway by a branch-line. For some time a fairly brisk trade was carried on in coal, grain, manure, timber, and other articles, but matters did not progress smoothly, and the company after a while got into litigation with Mr. Turnour, the holder of the debenture shares, the secretary, and others. In 1880 Mr. Ellett, who had all along held the view that the docks could be made to pay, entered into an agreement with the trustees of Mr. Turnour for the purchase of the debenture shares, on condition that the Chancery suit was withdrawn, and he also subsequently purchased the *elegit* obtained by the secretary for the security of his cost. In 1881 Mr. James Mountstephens, of Torquay, was instructed to examine the docks, and prepare plans for the necessary reconstruction where needed. This was done, and it was found that in order to make the property worth anything at all a considerable outlay must be incurred. However, it was resolved that the work should be proceeded with, and a contract was entered into with Messrs. Redway, Son, & Carter for carrying it out. The weakness of the old walls was due, to some extent, to the fact that white lime had been used in their construction, and one of the preliminary steps taken by Mr. Ellett for the reconstruction of the docks was the erection of lime-kilns close at hand for the burning of the blue lias stone from Lyme Regis, a material which has been proved in other places to be admirably adapted for works of this kind. The jetty has been entirely rebuilt, and the new structure is a substantial erection of pitch-pine, carefully creosoted, and the outer piles are sheathed with yellow metal. The walls at the entrance to the docks, where the gates will be hung, have been entirely rebuilt in a substantial manner, and it has been found necessary to rebuild about three-fourths of the dock walls, while the remainder have been thoroughly repaired and secured with a heavy walling of creosoted timber. The entrance is also piled in the same way. For a very long time there have been no gates to the docks, but new ones, formed of greenheart, are in course of construction. The stone used in the rebuilding of the

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walls has been specially selected from Mr. Mountstephen's quarry, at Churston. A double line of rails has been laid down to the jetty, and a travelling steam crane provided for discharging cargoes at the jetty or in the docks. The works are expected to be completed, and the docks reopened for traffic, about August 1st. The extent of the quays under the new arrangement will be 1,500 ft.; and if this is found insufficient it is intended to carry jetties into the dock, and so increase the accommodation. It is also intended to carry the rails around the dock, so that the whole of the quays will be in direct communication with the London and South-Western Railway. The docks and the entrance to them are being dredged, so that any vessel that can come over the bar will be able to discharge at once at the jetty and dock. The work has been carried on under the management of Mr. Geo. Lavis (foreman to Messrs. Redway, Son, & Carter) and Mr. John Short (clerk of the works), and the personal supervision of Mr. James Mountstephens.

THE COST OF THE VYRNWY WATER-WORKS FOR LIVERPOOL.

IN pursuance of a resolution passed by the Liverpool City Council, the Water Committee have just issued a statement of expenditure and particulars of contracts entered into in connexion with the new waterworks at Vyrnwy. The first of the particulars given is the apportionment of wages paid, stores issued, and materials used at the Llanwyddn Works and Quarry, and the pipe line works, for the year 1881. This statement includes items of 11,599*l.* for permanent works at the embankment; 5,261*l.* for temporary accommodation works, including workmen's hall, provision stores, houses, stables, offices, and other buildings; 4,258*l.* for machinery; 3,825*l.* for miscellaneous plant; and 3,366*l.* for horses and harness, which with other items, make a total of 32,790*l.*, being 12,145*l.* for wages, and 20,645*l.* for material. At the Llanwyddn Quarry, the amount spent for wages for the year 1881 was 1,730*l.*; and for material, 1,375*l.*; making a total of 3,105*l.* The expenditure on the pipe line works for the year 1881 includes items of 45,832*l.* for cast-iron pipes; 4,359*l.* for pipe-laying; 1,524*l.* for tramway construction and removal; 1,675*l.* for machinery; 3,338*l.* for miscellaneous plant; and 2,545*l.* for horses and harness. These, with other items, make a total for the pipe line works of 67,363*l.*, being 9,381*l.* for wages, and 57,982*l.* for material. The amounts expended in the purchase of land, compensations, easements, and costs up to the 31st of December, 1881, are as follows:—Land for Vyrnwy watershed and reservoir, including costs, 80,977*l.* 16s. 1d.; compensations under Act of 1880, &c., 15,000*l.*; pipe line (land, easements, and costs), 4,682*l.* 18s. 10d.; total, 100,660*l.* 14s. 11d.

The foregoing gives the general expenditure for the year 1881. For the three months ending the 31st March, 1882, the expenditure in these works was as follows:—The apportionment of wages paid and materials used includes items of 6,188*l.* for permanent works; 1,056*l.* for temporary accommodation work; 1,866*l.* for machinery; 996*l.* for miscellaneous plant; and with other items the total is 10,967*l.*, being 6,165*l.* for wages and 4,801*l.* for materials. At Llanwddyn Quarry for the three months the amount of wages paid was 2,967*l.*; expenditure on materials, 2,139*l.*; making a total of 5,106*l.* At the pipe line works for the three months the items of expenditure included 2,555*l.* for the Hirnant Tunnel; 13,549*l.* for cast-iron pipes; 2,260*l.* for haulage of cast-iron pipes; 4,381*l.* for pipe-laying; 972*l.* for tramway construction and removal; 1,612*l.* for miscellaneous plant; and 542*l.* for superintendents, inspectors of pipes, clerks, and office expenses; making a total of 26,013*l.*, being 8,809*l.* for wages, and 17,204*l.* for materials. The expenses on the Mersey Crossing borings has been so far comparatively small, the salaries and materials used amounting only to 211*l.*, while on the Oswestry Reservoir and contingent works surveys the expenditure in wages was 132*l.* The amount expended in the purchase of lands and easements up to the 31st March in relation to the pipe line was 2,688*l.*

The committee append a list of contracts entered into up to the date of this return (May 21st, 1882), which shows that the total amount of the contracts is 297,886*l.* The particular contracts are:—For making and delivering (13 1-6th miles) cast-iron socket-pipes, from Messrs. Cochrane & Co., 68,494*l.*; for (5¼ miles) pipes, from Messrs. Cochrane & Co., 34,981*l.*; for (9½ miles) pipes, from Messrs. D. Y. Stewart & Co., 55,858*l.*; construction of Hirnant Tunnel (2 miles), from Mr. F. M'Culloch, 28,800*l.*; leading, laying, and fixing (8¼ miles) iron socket-pipes, from Mr. J. Jowett, 10,708*l.*; making and delivering (10¾ miles) cast-iron socket-pipes, from the Widnes Foundry Company, 65,096*l.*; construction of Cynynion and Llanforda Tunnels (1¼ mile), from Mabbutt & Owen, 21,900*l.*

RECORD OF BUILDING PATENTS.*

APPLICATIONS FOR LETTERS PATENT.

3,095. H. Conolly & A. E. Hubert, London. Overflow of water-closets. June 30, 1882.

3,096. H. Conolly, London. Water-waste preventers. June 30, 1882.

3,103. W. A. McI. Valon, Ramsgate. Bricks and tiles. July 1, 1882.

3,127. G. Hodson, Loughborough. Manufacture of artificial stone, &c. July 3, 1882.

3,168. M. Kellow, Penrhyndendraeth. Cutting and dressing stone, &c. July 5, 1882.

3,185. J. G. Tongue, London. Ventilating drying-rooms, &c. (Com. by H. Wattell, Tourcoing, France.) July 5, 1882.

3,191. W. C. Gibson, Newcastle-on-Tyne. Manufacture of a certain description of bricks, &c. July 6, 1882.

3,198. T. N. Sully, Wellington. Walls of houses, &c. July 6, 1882.

3,229. U. Bromley, G. Crowe, and W. James, Chester. Flushing apparatus for water-closets, &c. July 7, 1882.

3,260. J. C. Morris, Manchester. Stair-rods. July 10, 1882.

3,301. T. S. Webb, London. Preserving from corrosion the surfaces of ships, piers, bridges, &c. July 12, 1882.

3,316. W. R. Lake, London. Underground conduits for gas or water, &c. (Com. by A. Knaudt, Essen-on-the-Ruler, Prussia.) July 12, 1882.

3,324. C. Portway, Halstead. Gas-stoves. July 13, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named:—

July 4, 1882.

1,749. C. Major, Bridgwater. Construction of roofing tiles. April 12, 1882.

2,806. S. Deards, Harlow. Securing sheets of glass, &c., for roofing purposes. June 14, 1882.

July 7, 1882.

2,728. M. Cockburn, Falkirk. Public washing houses. June 10, 1882.

2,794. C. Hulseberg, London. Boilers for heating greenhouses and other buildings, &c. June 14, 1882.

2,772. R. W. Hitchings, London. Machinery for making slabs of plaster, &c., for ceilings. June 13, 1882.

2,815. A. B. Brown, Edinburgh. Apparatus for ventilating, &c. June 15, 1882.

July 11, 1882.

1,109. T. W. Helliwell, Brighouse. Securing sheets of zinc, &c., to roofs or sides of buildings. March 7, 1882.

2,116. A. W. Kershaw, Lancaster. Ventilators. May 5, 1882.

2,783. H. J. Haddan, London. Machinery for cutting and dressing stones. (Com. by A. McDonald, Massachusetts, U.S.A.) June 13, 1882.

July 14, 1882.

1,113. R. Pearson, Kingston-upon-Hull. Combination stench-traps. March 8, 1882.

1,143. E. P. Phillips, London. Spring hinges. March 9, 1882.

1,607. J. Matbisen, Christiania, Norway. Door-locks. April 3, 1882.

ABRIDGMENTS OF SPECIFICATIONS.

Published during the Week ending July 8, 1882.

5,184. E. W. Buller, Birmingham. Knobs and their attachments to spindles.

A rectangular tubular sheath is placed in the free k[illegible] in which is a spring with a tooth on its free end, and the spindle is forced into the sheath, the tooth engages one of the ratchet teeth on the spindle. To attach metal necks to earthenware knobs, when the spindle is passed through the neck into the knob, lead is run into the inside of the knob around the spindle. Nov. 28, 1881. Price 6d.

5,213. J. Nicholl, Halifax. Apparatus for heating conservatories, &c.

This consists of two cones which form the walls of water-spaces. The heat is applied by a Bunsen's burner, and the products of combustion pass to pipes slanting through the water to the exterior. (*Pro. Pro.*) Nov. 29, 1881. Price 2d.

5,224. E. V. Harris, Winchester. Window-sashes.

The sashes are swung upon pivots, which are so constructed that the sash can be lifted out of its pivots when required. Nov. 29, 1831. Price 6d.

5,228. J. Thomas, Bangor. Dams, retaining walls, &c.

A light iron casing is made of the required shape, placed in position, and filled with concrete. The casing is made strong enough to withstand the pressure of the concrete and to resist being corroded through until the concrete has set. Nov. 30, 1881. Price 6d.

5,276. J. Teer, Salford. Fire-grates.

These have a perforated fire-clay back and an air-chamber behind the back to which air is admitted from below the grate. A cover is fitted over the fire, which compels the smoke, &c., to enter this air-chamber, where it is consumed. (*Pro. Pro.*) Dec. 2, 1881. Price 2d.

5,279. T. Ivory, Edinburgh. Apparatus for heating and cooking by direct radiation from surfaces of metal, &c.

This uses the burners known as "Hofman's tube burners" made in the form of narrow boxes, having one of the faces pierced downwards with small holes for the issue of the gas. (*Pro. Pro.*) Dec. 2, 1881. Price 2d.

5,299. H. Green, Preston. Removing obstructions occasioned by frost in gas, water, and other pipes.

A solution is made of hydro-chloric acid, &c., and lime, which is filtered and evaporated to dryness as a saturated solution. This is poured down the pipes. Dec. 3, 1881. Price 2d.

5,064. E. Homan, London. Fireproof floors.

These are made with an iron framing formed of flat bars united by screw-bolts and nuts and concrete. Nov. 19, 1881. Price 6d.

5,319. S. Sturm, Cologne. Increasing the heating power of domestic stoves and fire-places.

A number of horizontal perforated metal diaphragms are placed in the flue of the chimney, which prevent the heat passing off so rapidly. (*Pro. Pro.*) Dec. 5, 1881. Price 2d.

5,324. W. Saunders, London. Implement and receiver for cleansing floors, &c.

The implement is a modification of a squeegee in which the indiarubber is in form of a roller, and water is conveyed to the roller by a flexible pipe leading down the handle. The receiver is like a dust-pan, but the outer edge is inclined downwards to prevent the mud and dirt from falling out. (*Pro. Pro.*) Dec. 6, 1881. Price 2d.

5,377. D. G. Cameron, London. Water-closets, &c.

The water held in the pan is sealed, and an overflow is arranged behind the seal, which leads into the chamber below. A large valve is arranged to allow of the discharge of the contents of the pan, and the chamber below is trapped. The flush is delivered, and an after-flush provided, by the pressure of water acting above and below a flexible diaphragm, with an air-chamber above. There are two valves,—one for the flush, and the other for the after-flush, the closing of the first opening the second. Dec. 8, 1881. Price 8d.

5,381. D. Gill, Weston-super-Mare. Water-closet apparatus.

The outlet from the basin to the trap is screened by a swing-valve which is actuated by a float in a small chamber to which water is admitted. The flushing-rim is made separate from the basin. The closet is ventilated by a junction-pipe in connexion with the flushing-pipe and an up-shaft air-pipe. A self-adjusting valve is placed in the junction-pipe, which closes the air-pipe when the closet is flushed, and closes the flushing-pipe when the flush is over leaving the air-pipe open. Dec. 9, 1881. Price 6d.

A Caution.—At the Westminster Police Court, on the 8th inst., Mr. William Miller, decorator, of Appleford-road, Westbourne Park, was summoned by Inspector Lightfoot, of the Westminster District Board of Works, for having on the 9th of June placed a quantity of white-washing material over a public grating communicating with a sewer. Mr. Warrington Rogers, who prosecuted for the Board of Works of the Westminster District, stated that the material consigned to the sewer by the defendant amalgamated with road refuse and formed a kind of cement or concrete, which blocked up the traps of the sewers and prevented the proper flow of sewage. The defence was that there had been no harm done by getting rid of some dirty water. The inspector said that the consistency of the [illegible] was quite equal to that of mud, if not [illegible] Mr. D'Eyncourt thought there was [illegible]ry dangerous practice, and inflicted [illegible] and costs.

* Compiled by Hart & Co., Patent Agents, 2 Bridge-street.

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THE SANITARY CONDITION OF LAMBETH.

AT the meeting of the Lambeth Vestry, on the 13th inst., Mr. Andrew moved the following motion:—

"That in consequence of the frequent reports of our medical officer and the inspectors of nuisances, we, the Vestry of Lambeth, desire to draw the attention of the Metropolitan Board of Works to the unsanitary condition of the great majority of habitable buildings, owing to the amount of sewer-gas conducted thereinto, and to suggest that this unsatisfactory state of things may be remedied by the compulsory adoption of the principle of inserting an intercepting syphon, conjointly with the construction of an air-chamber in the house-drain at a point between the inlet to the main sewer, and before entering or passing under any buildings), and the continuation of all soil-pipes to the highest point of the roofs, such soil-pipes to be left open at the top for through-ventilation from the air-chamber; or by any other means the Board may devise to prevent the admission of sewer-gas."

Mr. France seconded.

Mr. Bygrave dwelt upon the importance of improved sanitary appliances, and expressed a conviction that if the suggestion of Mr. Andrew tended to lessen the spread of disease, Lambeth would have reason to be thankful to that gentleman.

Mr. Sharpley remarked that a man who devised a scheme to prevent the encroachment of obnoxious inhalations into dwelling-houses would prove an undoubted benefactor to the human race. At present private houses were the only means by which public sewers were ventilated.

Mr. Bennett hoped the matter would be thoroughly thrashed out in the Sewers Committee. To his mind the defective manner in which drains were laid had much to do with the nuisances that arose in the metropolis.

Mr. Fowler remarked upon the healthy condition of Lambeth, and said that, with the view of ascertaining the merits of the plan proposed by Mr. Andrew, he should like to see a model of it prepared, and every investigation made with respect to it.

The motion was agreed to.

SALE OF FREEHOLD GROUND-RENTS AND FREEHOLD HOUSES IN ISLINGTON.

ONE of the largest sales of the above class of property which has been held in London for some time past took place on Tuesday in last week, in the large room at the Cannon-street Hotel, when Messrs. Debenham, Tewson, & Co. submitted to competition the Barnsbury Park Estate in Islington. The property was described as consisting of the valuable freehold ground-rents amounting to 812*l.* per annum, secured upon the whole of Barnsbury Park, Barnsbury-square, Mountford-terrace, Mountford-crescent, Upper Park-street, Brooksby-street, Henry-street, Barnsbury-mews, and Brooksby-mews, a large portion of Liverpool-road, Thornhill-road and John-street, and Offord-road, extending over an area of about twenty-seven acres, and comprising upwards of 300 houses, including numerous shops, workshops, and other business premises. The particulars stated that the property would be sold, as regarded most of the lots, with reversion to the rack-rents in 26½ years, and as respected three of the lots in seven years, and that these rents were estimated to produce at the present time nearly 14,000*l.* per annum. The property was divided into 85 lots, 46 of which consisted of actual ground-rents, ranging from 6*l.* to 100*l.* each, and producing 812*l.* per annum, as already stated; the remaining 39 lots consisting of freehold residences in Barnsbury Park, Barnsbury-square, and other portions of the estate, let on leases for terms expiring in 26½ years, at a peppercorn rent, after which the purchasers would be entitled to the rack-rents, the total estimated annual value of which was 4,392*l.* One of the conditions of the sale provided for the preservation of the garden in Barnsbury-square as a pleasure garden for the use of the owners and occupiers of the houses in the square. Mr. Tewson, the auctioneer, in commencing the proceedings, observed that the sale was originally intended to take place at the Auction Mart, but the large attendance proved that there was no room at the Mart large enough. In adverting to the great value of the property, he said that the rack-rents were, in every case, believed to have been fairly estimated, and based upon the actual rents at present paid by the occupiers, but that with the growing increase in value of property in the district, it was reasonable to conclude that higher rents might be expected on the expiration of the ground leases. Every lot was sold, the total proceeds being upwards of 73,000*l.*

THE SEWERAGE OF SLOUGH, BUCKS.

THE sewerage works in this town, which were commenced in the summer of 1878, and carried out under the advice of Mr. R. B. Grantham, M.Inst.C.E., were completed in August, 1880, and the house connexions are made nearly throughout the town. A new system of sewers was laid down, and kept entirely distinct from the drains discharging the surface and storm water.

The sewage is conveyed to tanks at a pumping station erected on the west side of the Railway Viaduct between Windsor and Slough, and is thence pumped by a 10-h.p. engine to a piece of land near Dorney Common, about one mile and three-quarters further west.

The works were let in four contracts: No. 1 to Messrs. James Watt & Co., for the engines, pumps, and rising main; No. 2 to Messrs. Jones & Jepson, for the sewers; No. 3 to Mr. Woodbridge, of Maidenhead, for the tanks and engine-house; and No. 4 to several contractors for various small works. Mr. F. Smith was clerk of works.

The population now connected to the sewers is 5,500, and the normal daily flow of sewage is about 70,000 gallons a day, or about 13 gallons per head. The area of land acquired by the Board is about 25 acres, but at present it has been found sufficient to lay out about half of this on the broad irrigation system. The sewage is pumped up about four days per week in dry weather, and the quantity of land to which sewage is daily applied is about eight acres.

The subsoil of the farm is gravel, and no difficulty has been found in disposing of the sewage, which disappears within a short time of application. There are no under-drains and no effluent, and, it is stated, no cause for complaint. Good crops of mangold and Italian rye grass have been grown and are now growing.

By separating the sewage from the surface-water, the sewage of 5,500 people is regularly and effectually disposed of upon a total area of thirteen acres, or more than 400 people to the acre, without nuisance or offence of any kind.

Complaints were made when the house-drains were first connected of the offensive smells from the sewers. Ventilation is now effected by connecting the sewers with the lamp-posts, the shafts of which are 4 in. in diameter at the bottom, and 2¾ in. at the top. In addition to these, iron up-shafts, 6 in. in diameter have been fixed to the dead side-walls of the houses with Archimedian-screw cowls fixed on the top.

Where these means have been adopted the sewers, we learn, have been rendered inoffensive, and it has been determined to increase the number of the ventilators.

FIRE-RISKS FROM ELECTRIC LIGHTING.

THE Committee of the Society of Telegraph Engineers and of Electricians, appointed on May the 11th, 1882, to consider the subject of fire-risks arising from electric lighting, have formulated a set of rules and regulations for the prevention of these risks:—These rules and regulations are drawn up, not only for the guidance and instruction of those who have electric-lighting apparatus installed on their premises, but for the reduction to a minimum of those risks of fire which are inherent to every system of artificial illumination.

The chief dangers of every new application of electricity arise mainly from ignorance and inexperience on the part of those who supply and fit up the requisite plant.

The difficulties that beset the electric engineer are chiefly internal and invisible, and they can only be effectually guarded against by "testing" or probing with electric currents. They depend chiefly on leakage, undue resistance in the conductor, and bad joints, which lead to waste of energy and the production of heat. These defects can only be detected by measuring, by means of special apparatus, the currents that are either ordinarily or for the purpose of testing, passed through the circuit. Bare or exposed conductors should always be within visual inspection, since the accidental falling on to, or the thoughtless placing of other conducting bodies upon such conductors might lead to "short-circuiting," or the sudden generation of heat due to a powerful current of electricity in conductors too small to carry it.

It cannot be too strongly urged that amongst the chief enemies to be guarded against are the presence of moisture and the use of "earth" as part of the circuit. Moisture leads to loss of current and to the destruction of the conductor by electrolytic corrosion, and the injudicious use of "earth" as a part of the circuit tends to magnify every other source of difficulty and danger.

The chief element of safety is the employment of skilled and experienced electricians to supervise the work.

The rules are signed,—F. H. Webb, secretary.

COMPENSATION CASES.

FARDELL *v.* METROPOLITAN AND METROPOLITAN DISTRICT RAILWAY COMPANIES.

THIS was a case arising out of the completion of the Inner Circle by the Metropolitan and Metropolitan District Railway Companies, heard on the 12th inst. in the Lord Mayor's Court. The claimant was Mr. Thomas S. Fardell, carrier, contractor, and job-master, 4, The Crescent, Minories.

Mr. Philbrick, Q.C., and Mr. Francis Turner appeared far the claimant; and the defendant companies were represented by Mr. Webster, Q.C., and Mr. Moulton.

The claim was in respect of loss of business, &c., through the above-named premises being required for the purpose of carrying out the communication between Aldgate and the Mansion House. The jury having viewed the premises,

Mr. Philbrick, in opening the case for the claimant, said Mr. Fardell was a licensed carman and contractor, to which he had added the business of a job-master, and the premises in question comprised his residence and offices, and were the head-quarters and centre from which a very extensive business was carried on. He took the premises in The Crescent, Minories, with a fourteen years' lease from Christmas, 1873. Mr. Ellis was the lessee, having the premises from the Corporation for 85*l.* a year, subject to the usual covenants. Mr. Fardell, about the same time obtained premises adjoining from the Trinity House for the purpose of a stabling depôt for vans and horses. He also had premises adjoining rented from a Mr. Hilbury. These stables or lay-byes were necessary, as the police would have interfered if the vans had been allowed to stand in the street. He had also five or six other stables in different parts of London connected by telephone with the head office. Altogether, about 120 horses were employed in the work. It was important that a carman should be near his customers, and also near the line of traffic between the City and the docks. The claimant was agent for the Great Eastern, Great Northern, Midland, and also did business for the South-Eastern and other companies. After making every possible allowance, the net profit arising from the business was something like 7,700*l.* a year. The amount they claimed was made up as follows:—The premises were estimated at 4½ years' purchase for the remainder of the term, which, with 10 per cent. added for compulsory sale, would be 370*l.*; fixtures, 64*l.*; cost of removal, 50*l.*; the stables adjoining, 400*l.*, which had been expended on them, making in all, 884*l.* In addition to this he claimed for loss of business one year's profits, or 7,700*l.*

Mr. Slater, accountant, was examined as to the value of the business. He said the gross total earnings for the last three years was 54,900*l.*, of which 32,800*l.* consisted of large contracts. Since the change of residence, the business was less by 3,700*l.* per annum.

On the second day of the case, Mr. Webster addressed the jury on behalf of the company, contending that the claimant could have no difficulty in obtaining other and equally suitable premises for his business in the Minories, and that he was only entitled to fair compensation for any loss or inconvenience he might sustain.

The Recorder then briefly summed up, and the jury, after a brief deliberation, awarded the sum of 1,140*l.*

THE CO-OPERATIVE WHOLESALE SOCIETY (LIMITED) *v.* THE METROPOLITAN AND METROPOLITAN DISTRICT RAILWAY COMPANY (CITY LINES AND EXTENSIONS) JOINT COMMITTEE.

THIS was a claim for a leasehold interest in premises consisting of a frontage, 118, Minories, and a warehouse, 3, America-square.

Mr. Grantham, Q.C., M.P., appeared for the

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claimants; and Mr. R. E. Webster, Q.C., and Mr. Moulton for the defendants.

Mr. Grantham, in opening the case, said the claimants, whose head-quarters were in Manchester, took these premises in 1874 on a 28 years' lease from December 25th, 1873. The manager of the society, after looking about the neighbourhood for suitable premises, found that the rent of these was very moderate in comparison with what was to be obtained elsewhere. The landlord, being very anxious to let, came down in his demands from 400*l.* to 250*l.* a year, to which the claimants agreed, and undertook to lay out, and did lay out upon them, 640*l.* Finding that they would very soon have to remove, as the railway was coming, and being anxious to keep together their business connexion, which had become very profitable, they secured other premises in Leman-street, to which they removed, leaving those in the Minories empty. They took this course rather than make up a claim against the railway companies, and now they came forward in the most honest and straightforward manner possible, and made a claim for the value of the lease only, asking nothing for injury to trade.

Mr. Webster, after the statement, had a brief colloquy with Mr. Grantham, and he then stated that the defendant company had no knowledge until after what fell from Mr. Grantham that it was in consequence of the railway companies coming that the claimants took other premises. As Mr. Grantham stated that he could prove that it was a *bonâ-fide* removal in consequence of the fear of the railway coming, he (Mr. Webster) had agreed to consent to a verdict for 1,000*l.*

The surveyors engaged in the case were,—Mr. Edwin Fox, Mr. E. Eason, and Mr. E. F. D. Fuller, for the claimants; and Mr. J. R. Bonny, Mr. E. N. Clifton, and Mr. E. Farmer, for the railway company.

CITY OF LONDON REAL PROPERTY COMPANY *v.* THE METROPOLITAN AND METROPOLITAN DISTRICT RAILWAY COMPANIES.

ON Monday last this case was decided before the Recorder (Sir T. Chambers, Q.C., M.P.) and a special jury.

Mr. Webster, Q.C., and Mr. Freeman, instructed by Messrs. Tatham & Co., appeared for the plaintiffs; Mr. Matthews, Q.C., Mr. Bidder, Q.C., and Mr. Gye, instructed by Messrs. Burchell, represented the defendant companies.

The plaintiffs claimed compensation for the compulsory acquisition of certain building land situate in Great Tower-street, between Mark-lane and Mincing-lane, and which was required for the completion of the Inner Circle line. The site in question had been cleared of its old buildings by the plaintiffs, with the view of carrying out extensive improvements, and it was urged by their learned counsel that as they had acquired the whole leasehold interest, the railway companies would be saved a great deal of trouble, as they would not have to deal with a number of separate interests. The actual area at first proposed to be taken was 6,440 ft., and the net rental which the plaintiffs expected to derive was 7,400*l.* Twenty years' purchase was the least that might be expected in connexion with such property, but they asked only nineteen years' purchase, which came out at 140,600*l.* Deducting 3,150*l.* for ground-rent, made the sum 137,450*l.* The expense of the new building contemplated was reckoned at 22,400*l.*, which brought the amount down to 115,000*l.*, and adding the usual 10 per cent. for forced sale, made the total claim 136,500*l.*

After a three days' hearing in March last, the case was adjourned with a view to an arrangement; and on Monday Mr. Webster intimated that the companies had agreed to acquire only 4,242 square feet of the land, and to pay for the space 63,630*l.*, or at the rate of about 15*l.* per square foot.

A verdict for that amount was accordingly entered.

SCOTCH NEWS.

Vale of Leven.—The ceremony of laying the foundation-stone of the Ewing-Gilmour Institute,—Mr. W. E. Gilmour's munificent gift to the Vale of Leven,—took place on the 24th ult., and was performed with Masonic honours. The ceremony of laying the stone was performed by Brother J. M. Martin, P.G.M., who was presented by Miss Campbell, of Tillichewan, with a handsome silver trowel—the gift of Mr. Gilmour. Miss Campbell also gracefully performed the ceremony of "naming" the Institute. Thereafter, Brother Martin addressed the assemblage. He congratulated Brother Gilmour on the successful issue of the day's proceedings, and stated that it was a cause of profound thankfulness when a neighbourhood such as this was blessed with gentlemen like Brother Gilmour, who, deriving his wealth from the people, was not forgetful of their interests. The Institute will consist of one large reading-room, smoking and reading room, hall, commitee-room, coffee-room, and lavatories, with attendant's apartments. The cost of the building, with the fund invested for the supply of newspapers and various magazines, will be about 5,000*l.*

Dundee.—A special meeting of the Dundee School Board was held on the 22nd of June, Professor Moncur in the chair, for the purpose of considering the terms which they would offer to the Town Council for the acquisition of a site for the erection of the Harris Institution, the gift of ex-Bailie Harris to the School Board, on behalf of the town. The site proposed to be acquired extends to 121 poles, and lies on the east side of Courthouse-square. Mr. Maclaren, the architect, submitted a plan showing the proposed site of a school sufficient to afford accommodation for 1,000 scholars. After full consideration, the Board instructed the clerk to make offer to the Town Council of 3*l.* 10s. per pole for 120 poles, upon the footing that 20 poles thereof would be taken off their hands by the Town Council and Police Commission jointly, and thrown into Courthouse-square for widening the same, at the same rate of feu-duty,—namely, 3*l.* 10s. per pole.

THE NEW GOVERNMENT OFFICES.

SIR,—As the daily press, from the great journal downwards, has quoted liberally from your "Additional Chapter to the Story of the Government Offices," it may be hoped that the love of art has so permeated the general public that they at last take some interest in such proposed architectural works as they will have to pay for. Just ten years ago, when the erection of the Natural History Museum, a new National Gallery, the new Post Office, Court of Justice, and several other Government buildings was announced, I remember that there was then as now much the same feeling of dissatisfaction with the way in which things were managed at the Office of Works. A correspondent in the *Times*,—believed to be Sir Henry Layard,—said:—"Never has the violation of common sense in the determination of what our public buildings are to be been so conspicuous as at the present time. Arrangements are being made for building the public offices in Downing-street, the South Kensington Museum, &c. The plans for the War and Admiralty Offices are being considered, Heaven only knows how or by whom. The First Commissioner of Works takes his orders from the Treasury, which, by fits and starts, lets him have his own way or stops proceedings. But the Treasury is the constitutional authority for finance, and if it goes into architecture it steps beyond its province. The First Commissioner is not chosen for any architectural qualifications. He is a Minister directly responsible to Parliament for the expenses upon the national buildings and the administration of a proper system. But the working of the present 'no system' is to permit the First Commissioner for the time being to indulge in any whims of his own, though he may have protested that he knows nothing of art. At one time 'costliness and extravagance,' at another 'meanness,' at another 'vacillation and uncertainty.' Sometimes, however, months of labour and expense upon plans and estimates ordered by this officer are thrown away by a vigorous First Lord of the Treasury changing the style from Gothic to Renaissance, as in the case of the Foreign Office, or from Renaissance to Gothic or Romanesque, as in that of the Natural History Museum."

Here, then, is "confusion worse confounded." And it may be reasonably asked who in the midst of it all is responsible to the paymaster? The perfunctory style of the discussion in the House of Lords on the 14th inst. shows that it is useless to expect it from Parliament.

The writer of the letter I have quoted from urges a permanent advising council,—to consist of three architects, one named by the Government, one by the Royal Academy, and one by the Royal Institute of British Architects; of three artists, one a painter, one a sculptor, and one a decorator; one surveyor; together with two laymen, one being a member of the House of Lords, another a member of the House of Commons,—in all nine members. To insure responsible attendance to the duty, let this council be paid. A very moderate tax on the expenditure upon the public buildings,—say a farthing in the pound,—would amply suffice. This council would act as a jury to give a verdict on behalf of the public, and the First Commissioner would be the judge to adopt it, or to give good reasons for rejecting it. The operation of this plan would be as follows:—The First Commissioner having got his plans and estimates of an intended edifice would summon the permanent council. Their report would be made and published, and the plans and models exhibited to the public. He would then report to the Treasury, and the cost of the proposed building would be submitted to Parliament. By this means caprice, extravagance, vacillation, and meanness would be prevented, Parliament would know for what it was voting public money, and the public would have the means of expressing its opinion on buildings which are always to be before its eyes, to gratify or disgust them.

Instead of this, or some similar and intelligible arrangement, which would be the best guarantee that the national buildings should exhibit the highest architectural art, the best materials, and the most perfect construction, the public is compelled to rely upon the unchecked, irresponsible notions of the permanent secretary of the Office of Works, who in the Committee of 1877 gave the following answer to Mr. Beresford-Hope:—

"If you were building a new War Office or a new Admiralty it would be infinitely better built and more satisfactory in every way if it were built in the Department. . . . . The only additional expense involved would be the hiring of a few temporary draughtsmen."

Well! Mr. A. B. Mitford has evidently any amount of pluck, and perhaps our oracle is prepared to assert that the New Post-office, a work of the Department, shows as much advance on previous architectural works, and as much originality, as the New Natural History Museum by Mr. Waterhouse, or the London University building in Burlington-gardens by Mr. Pennethorne.

H. DE SIVART.

SCULPTURAL COMPETITION, ST. GEORGE'S HALL, LIVERPOOL.

SIR,—In your last week's number you make a short reference to the competition for the sculptural panels, St. George's Hall, Liverpool, speaking more favourably of the designs sent in than the local paper. As one of the competitors, I should like to say that no notice has been given us as to the calling in of a professional arbitrator in decision, neither have we heard of any name mentioned. For my own part, I should not have entered into it, but I have had a great deal to do with the building, and am, I believe, nearly the only surviving one of those engaged in its erection in the year 1843. My father, the late James Kelsey, assisted by myself, made the full-size models in London for the Corinthian capitals and other portions of architectural sculpture; and my father, in 1844, went to Liverpool by the wish of the original architect of the building, H. Lonsdale Elmes, and completed the whole of the external architectural sculpture, which was done in 1846. The year after, Mr. Elmes died, and things were almost at a stand-still until 1849. In August, 1849, I was, by the wish of Mr. W. H. Wordley, who had been resident drawing clerk for Mr. Elmes, engaged to execute the models for the interior decorations, which we carried on under the superintendence of Mr. Wordley and the then town surveyor, Mr. J. Wightman. In the year 1851, Professor C. R. Cockerell, R.A., took the building in hand. Under his directions I completed the various models and works required, having two of the rooms in the building for a studio. All these works were completed in the year 1856. The panels now in question were often spoken of, particularly between myself and Mr. W. H. Wordley, who has since died; and I think the designs we have sent in embody some of the ideas then entertained.

We have taken a comprehensive view of the matter because we considered that to design only seven out of twenty-eight would be unsatisfactory. With these views we have sent twenty-eight outline designs and nine quarter full-size models illustrating nine of the outlines.

COMPETITORS.

Messrs. Chubb & Son's Works.—Messrs. Chubb & Son, the eminent safe and lock manufacturers, have decided on removing their business from Wolverhampton to London. Their works in Wolverhampton have been established over fifty years. Having, however, acquired extensive premises in London, the firm propose to concentrate their business in the metropolis.

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PURCHASES BY THE ART-UNION OF LONDON.

THE following are the principal works selected by prizeholders of the Art-Union of London:—

From the Royal Academy.—Asleep, Mrs. Laura T. Alma-Tadema, 75*l.*; The Edge of a Pine Wood, Stuart Lloyd, 45*l.*; A Vexed Question, L. C. Henley, 40*l.*; Dread Winter, John Piggott, 40*l.*; A Little King, W. Tyndale, 40*l.*; Evening, Miss C. J. Weekes, 36*l.* 15s.; The Last Road, Hector Caffieri, 35*l.*; An Anxious Moment, Norman Taylor, 30*l.*; "The Winds and the Waves of the Ocean," Davidson Knowles, 30*l.*; "Multiplication is Vexation," G. W. C. Hutchinson, 30*l.*; Poachers, Edwd. Holmes, 25*l.*; On the Beach, Mumbles, near Swansea, T. Griffiths, 20*l.*

From the Society of British Artists.—Mothers and Children, G. A. Holmes, 100*l.*; Moel Wyn, Festiniog Valley, Jas. Peel, 75*l.*; Waterfall on the Dulas, South Wales, J. B. Smith, 75*l.*; A Sandy Road near Grindleford Bridge, Derbyshire, Geo. Turner, 65*l.*; "Boys will be Boys," Walter S. Stacey, 60*l.*; Rustic Flirtation, J. T. Peele, 50*l.*; The Casbah, Algiers, Ph. Pavy, 50*l.*; Collecting Dead Leaves, W. Luker, 50*l.*; Sunday Afternoon, Jas. Gow, 50*l.*; The Highest Bidder, Jas. Hayllar, 50*l.*; Towing over the Tide, W. L. Wyllie, 40*l.*; The Mist of the Morning, G. S. Walters, 40*l.*; Five o'Clock Tea, Sydney Muschamp, 35*l.*; Rest by the Way, W. Bromley, 35*l.*; Sussex Flats, A. Glendening, jun., 35*l.*; Trawlers going down Channel, G. S. Walters, 35*l.*; Driving the Cows to Marsh, T. F. Goodall, 35*l.*; Early Morning, Lynmouth, North Devon, Mrs. Harriet A. Seymour, 30*l.*; The Old Well at Eashing, Ralph Todd, 25*l.*; Springtime, A. Quinton, 25*l.*; Boulogne Fishing-Girl, H. Caffieri, 25*l.*; The Mill-Weir, Edward R. Taylor, 25*l.*; Corrie's Coal Derrick in Bagship Reach, W. L. Wyllie, 25*l.*; Passing Clouds, H. Maurice Page, 25*l.*; Noon, T. F. Wainwright, 20*l.*; Beating up Thames, Claude T. S. Moore, 20*l.*; Boulogne Milk-Girl, H. Caffieri, 20*l.*

From the Grosvenor Gallery.—Good-night to the Flowers, R. P. Staples, 80*l.*; In the Heart of Dartmoor, J. Whipple, 31*l.* 10s.; "Tiger, Tiger, burning bright," &c., J. W. Taylor, 30*l.*

From the Royal Scottish Academy.—Windy Weather, Loch Insh, Inverness-shire, W. B. Brown, 45*l.*

From the Royal Society of Painters in Water-colours.—Near the Rialto, looking towards the Palazzo Foscari, Venice, W. Callow, 42*l.*; Bridge over the Duddon, Autumn, C. Rigby, 31*l.* 10s.; the Ear Rock, Mullion Cove, Cornwall, S. P. Jackson, 20*l.*

From the Institute of Painters in Water-colours.—Claseywell Pool, near Prince Town, Dartmoor, Philip Mitchell, 26*l.* 5s.

From the Royal Albert Hall.—For the Abbot's Table, F. Andreotti, 42*l.*; "The Skies, they were Ashen and Sober," J. Anderson, 30*l.*; Near Hartland, Devon, J. E. Meadows, 25*l.*; In Burnham Beeches, A. Morris, 20*l.*; Morning on the Loddon, A. Morris, 20*l.*; A Stitch in Time, J. G. Faed, 20*l.*

From the Royal Hibernian Academy.—The Pretty Cup-bearer, A. F. Patten, 18*l.* 18s.

RATING OF BUILDERS' PREMISES.

ON the 10th inst. the Assessment Committee of St. George's, Hanover-square, met to consider appeals against the Supplemental Valuation List. Amongst the appeals heard was that of Messrs. McLachlan & Sons, of Clapham Common and St. James's-street, who appealed against an assessment made upon workshops, &c., recently taken by them in Johnson-street, Westminster. The case had been before the Committee under a Provisional Valuation List in January last, when they refused to allow the deduction of one-third to which factories are entitled under the Valuation Metropolis Act, but treated it as a house, and only allowed a deduction of one-sixth. On the re-hearing of the case on Monday last, the Committee allowed the appeal, thereby conceding the principle that a builder and contractor's premises, in which machinery is used, is entitled to be classed as a "Factory" under the Valuation Metropolis Act. Mr. W. H. Blanch, Assessment Valuer and Rate and Tax Adjustor, of 8, Stationers' Hall-court, conducted the appeal on behalf of the appellants.

Practical Engineering.—In addition to the lectures on "Physical Science," now being delivered in the new Science Theatre of the Alexandra Palace, by students of the College of Practical Engineering, Muswell-hill, the college staff will be reinforced by a number of eminent practical engineers, who will give lectures on some of the most important topics in civil and mechanical engineering. The first of these lectures will be on the difficult subject of "Waterworks" by the Hon. W. J. McAlpine, past-president of the American Institution of Civil Engineers.

SUBURBAN BUILDING LAND.

MR. CHARLES BELTON, on behalf of the United Land Company, Limited, has recently purchased six of the most valuable building estates in the neighbourhood of the Metropolis, viz.:—

1. The Kilburn House Estate, comprising about thirty acres of freehold building land, with frontages to Edgware-road, Priory Park-road, and Willesden-lane, nearly adjoining Alec Keene's.
2. The Oaklands Hall Estate, late the residence of Sir Charles Murray, adjoining the Oak Lodge Estate, Kilburn, with valuable frontages to West End-lane, Palmerston-road, and Kingsgate-road.
3. The King's-road Estate, Fulham, consisting of nearly twenty acres of freehold building land, with three excellent houses thereon, and extensive frontages to King's-road, Hurlingham-road, &c.
4. The Elmhurst Estate, Upton, close to West Ham Park, consisting of about sixteen acres of very eligible building land, with extensive frontages to main roads.
5. The Bruce Grove Estate, Tottenham, consisting of about thirty acres of freehold building land, adjoining the Great Eastern Railway Station.
6. The Harrow-road Estate, Kensal-green, consisting of about twenty acres of freehold building land, with extensive frontages to the Harrow-road, leading to the Edgware-road.

The whole of these properties are well placed, and will have main drainage, well-made roads, and curbed footpaths, the contracts for which will be shortly entered into to enable the land to be offered to the public in the ensuing spring.

The cost of these six building estates, including works, is upwards of 200,000*l.*

CHURCH-BUILDING NEWS.

West Bromwich.—On the 4th inst. the new Church of St. Paul, which has been erected at Gold's Hill, was opened for divine worship. The sermon was preached by the Very Rev. the Dean of Lichfield, who referred to the circumstances under which the new church had been erected. He said these circumstances were very remarkable, and could not be made too public. The congregation which would worship in that building was originally gathered in schools erected by the firm of the late John Bagnall & Sons. The schools were, however, sold about three years ago to the West Bromwich School Board, and this new church, which would be consecrated in the autumn, had been built to receive that congregation. The history of the church was curious, and he might almost say unique,—it was literally a church that had been transplanted there from another site. It was originally erected by Messrs. John Bagnall & Sons for the workmen employed at Cappon Fields Blast Furnaces, and the memorial window which adorned the present edifice was placed in the old building twenty-seven years ago by the workmen as an offering of gratitude to the firm for the gift of the church. Ultimately the services were discontinued in the church at Cappon Fields, and since then the vicar of St. James's (the Rev. R. Wall) purchased it, and it had been transferred piecemeal to the new site, at a cost of something like 2,200*l.*, which amount would include the furniture and fittings. The church, which is a plain structure, will seat about 300 persons.

Eastbourne.—The new Church of All Souls, Eastbourne, was consecrated on the 6th inst. by the Bishop of Chichester. The style of the building is described as being Lombard Byzantine. The subsoil being very bad, the concrete foundations had to be carried down to a depth of from 17 ft. to 20 ft. The building consists of nave, north and south aisles, chancel, chancel aisles, apse and tower, the latter connected with the church by a short arcade. The external dimensions are 127 ft. by 68 ft. by 51 ft. to ridge of nave; internal ditto, nave, 86 ft. 6 in. by 33 ft. by 39 ft. to plate, or 49 ft. to top of open timber roof. The north and south aisles are each 75 ft. by 13 ft. by 18 ft. to plate, or 26 ft. to top of lean-to roof. The chancel is divided from the nave by an arch 24 ft. wide, 37 ft. high, and measures 19 ft. by 33 ft. by 38 ft. to wooden ceiling. The apse, having a 12 ft. radius, contains seven windows with spherical stone vault over and a reredos in Caen stone. The north chancel aisle, 19 ft. by 13 ft., is arranged as a vestry, whilst the corresponding south aisle contains the organ, a fine instrument by Bishop & Sons. The campanile at the south-west corner is 16 ft. square by 83 ft. in height, and contains a clock with four faces by Dent & Co., and a peal of five bells by Mears & Stainbank. The materials of the church are Keymer bricks and buff bricks from Tamworth, with red and buff terra cotta by Gibbs & Canning, of Tamworth. Internally the walls are lined with Burham bricks and the stone arcading is in white and blue Corsham. The latter, as also the pulpit, desk, font, and mosaics were executed by Farmer & Brindley, of London. The corona of sixty jets, the hanging lamps, and the pulpit rail were made by Hart, Son, & Peard; the tile floors and writing by Simpson & Sons; the iron railing by Johnston Bros. The contractor for the general work was Mr. James Peerless, of Eastbourne, and the clerk of works Mr. Walter Peart. The total cost has been about 18,000*l.*, and the whole of the work was carried out from the designs and under the directions of Messrs. Parr, Strong, & Parr, architects, London.

Bath.—On the 3rd inst. the Rev. Canon Bernard laid the corner-stone of a new chancel, which, together with a vestry and an organ-chamber, is to be added to St. Stephen's Church, Lansdown. The dimensions of the work are,—chancel, 27 ft. by 21 ft. 6 in.; vestry, 14 ft. by 17 ft. 6 in.; organ-chamber, 12 ft. by 17 ft. 6 in. The chancel will have an apsidal end, and will be lighted by three two-light windows; on the right side the organ-chamber will be built, and on the opposite side it is intended to erect the vestry. As far as possible the general harmony of the building will be preserved, although, in making these additions, a purer style of Decorated Gothic will be used. The work is from designs of Mr. Wilcox, architect, of Bath, and Messrs. Morgan & Lovell, also of that city, are the contractors. Their contract amounts to 1,440*l.* A new organ, to supersede the one at present occupying the gallery underneath the tower, will be built by Mr. Vowles, of Bristol.

Lochgilphead.—The committee chosen to further the erection of a new church on the site of the old one met on the 7th inst. to select a plan. Two plans by Mr. Baldie were approved of, but the committee left themselves to be guided by the decision of the Baird Trust as to which of them should become the building plan, also to abide by any modification of either plan the Trust may suggest or decided upon. The architect's estimate of the cost of the building is 2,300*l.*

Kendal.—The parishioners are about to remodel the interior of St. George's Church, Kendal, and to re-seat the whole with open seats. A heating apparatus and a new organ are to be placed in the church, and the choir-stalls are to be removed to the east end. The architect is Mr. D. Brade, of Kendal.

Miscellanea.

The Worcestershire Art and Industrial Exhibition.—This undertaking, which has been in preparation for the last six months, was opened on Tuesday by Lord Beauchamp. Originally projected as a local exhibition of art and industry confined to the county, it was so warmly supported,—upwards of 6,000*l.* having been readily subscribed within the county as a guarantee fund,—that it was determined to extend its range as to the art portion. At the private view this portion of the exhibition was pronounced more excellent than anything that had hitherto been attempted in the provinces, the Manchester Art Treasures Exhibition, of course, excepted. It contains a great many valuable loan pictures. The South Kensington Museum has contributed eight cases of valuable articles. The art needlework, which is specially noteworthy, has been arranged with great labour and care by Lady Alwyne Compton. The collection of local products of industry, which occupies two-thirds of the interior of the building, includes some high-class specimens of Worcester ware, the Worcester Royal Porcelain Company contributing the larger share. The exhibition building, which is close to the central railway station, is divided into four courts, with a central nave of 250 ft. by 50 ft. At night the electric light will be used both inside and outside the exhibition, which will be kept open for three months.

Kirkcaldy New Public Hall.—The committee appointed to select a plan for the new Public Hall to be built in Pathhead have adopted a plan prepared by Messrs. Campbell Douglas & Sellars, architects, Glasgow. It is estimated that the total cost of the building, including site, will be about 3,000*l.*

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A Pulpit for Canada.—Messrs. F. & J. Morgan have just completed, at their yard, Fairview, Cheltenham, a stone pulpit for St. Matthew's Church, Quebec. The main outline of the design is circular, broken by the projection of massive square brackets placed at right angles. These, with the inverted conical superstructure, reach the floor, which is approached by winding steps from the rear, and is supported by columns, caps, and bases. A projecting string course, from which angle corbels depend, carries the statues, and the body of the structure, which is openly arched. Its clustered shafts are wrought in rare and highly polished marbles, the arches are deeply moulded and enriched, the spandrels diapered, and the whole surmounted by a boldly-carved capping-course carrying the canopies, and terminating in a moulding of veined Derbyshire alabaster. The break in the circular contour of the design is carried upwards by the disposition of the statues of St. John Baptist, St. Peter, and St. Paul. The massive substructure is intended to idealise the rock upon which the Church was founded; and the statues, the most powerful exponents of the preached gospel. The pulpit is a memorial to the Rev. George Hamilton, late curate of St. Matthew's, Quebec, and is to be erected in that church. The architect is Mr. Alfred Drew, of Margate. The marble columns were supplied by Mr. Boulton, of Cheltenham.

Memorial of a Borough Surveyor.—A monumental brass in memory of the late Mr. D. J. Humphris, for many years churchwarden of the parish of Cheltenham, and who filled various other responsible offices in the borough, has just been completed by Messrs. Marshall, by whom it has been exhibited prior to its erection in the parish church, where it will be placed on the north pier of the chancel arch. About 500*l.* were raised for the purposes of a memorial to Mr. Humphris, but at the request of the family the larger part of this sum was devoted to the clearing off of the debt on the parish church restoration, to which work Mr. Humphris had especially devoted himself. The brass has been designed by Mr. G. J. Cox (Messrs. Engall, Sanders, Cox, & Pearson), a former pupil and assistant of Mr. Humphris. The inscription commences as follows:—

"In memory of Daniel James Humphris, Architect and Borough Surveyor, who, for a period of twenty-one years consecutively, filled the office of Churchwarden of this Parish. This monumental brass, and the stained-glass window in the chancel, were erected by his fellow-townsmen to commemorate the self-sacrificing exertions of a most devoted and meritorious public servant, and the distinguished qualifications he possessed for the appointment he held for so many years with the unabated confidence and esteem of the parishioners."

The Warley Mount Estate, Brentwood. The new roads on this estate were opened on the 7th inst. The sewers and house drains in the roads having been completed before the roads were finished, notwithstanding the fact that the sewers are from 9 ft. to 11 ft. below the surface of the road, and in some parts in running sand, no difficulty was found in keeping the work to exact lines and inclination. Stanford's patent joints have been used. At the end of each straight line of sewer an inspection and ventilation shaft has been constructed, and at the head of each sewer one of Bowes, Scott, & Read's self-acting flushing syphons will be introduced.

Withington.—The foundation-stone of the Withington Congregational Church, Palatine-road, was laid on the 8th inst. by Mr. W. E. Melland. The church is being erected on the designs of Mr. R. F. Tolson, architect, Manchester, the contractors being Messrs. W. Southern & Sons, Salford. The building is Gothic in style. The church, when finished, will accommodate about 1,000 persons. The total cost of the building (including chief rent) will amount to nearly 10,000*l.*

Homes for Orphan Boys, Swanley.—Owing to unfavourable weather, the ceremony of laying the foundation-stone of these buildings, which was to have been performed by H.R.H. the Prince of Wales, had to be postponed. We last week published illustrations of the proposed buildings.

Glasgow Municipal Buildings Competition.—In our advertisement columns will be found an intimation from the Glasgow Institute of Architects desiring all competitors who wish to exhibit their preliminary sketches to at once send a statement of the wall space required by them.

Flameless Combustion.—At the *soirée* of the Society of Chemical Industry at Owens College, on Thursday in last week, a new theory of combustion was practically illustrated by Mr. Thomas Fletcher, of Warrington, the results being so totally unexpected that many present would, and in fact did, go away with the impression that some deception was being practised. According to the *Warrington Guardian*, Mr. Jacob Reese, the inventor of the Reese fusing disc, has stated his belief that if it were possible to produce combustion without flame, the temperatures and duty obtained from any fuel would be enormously increased. It has remained for Mr. Fletcher to not only prove the possibility of flameless combustion in more than one form, but also to demonstrate practically the enormously high temperatures which can be obtained by this means. Taking a ball of iron wire about 3 lb. in weight, Mr. Fletcher placed it on a slab of fire-clay, and directing a blow-pipe flame on it for a few seconds, he suddenly blew the flame out. The temperature increased so rapidly that in a few seconds the wrought iron fused and ran into drops, and this temperature was steadily maintained. The room was darkened, but the closest examination did not show a trace of flame, although the fact that the gas was burning was proved by repeatedly relighting and extinguishing it. How far this discovery can be utilised remains to be seen, but it would appear that the presence of flame, usually considered to be a sign of combustion, is really an indication of imperfect results, and the best duty is to be obtained only when the flame is totally absent.

The Nichols' Commemoration Column, Southampton.—A handsome lamp column and drinking fountain have been erected at the junction of the important thoroughfares known as the Six Dials, in St. Mary's, Southampton. They have been presented by Mr. Jonas Nichols, one of the municipal representatives of the ward, as a gift to the town, in commemoration of his son attaining his majority. The column is the work of Messrs. Steven, Bros., & Co., of Upper Thames-street, London, and Milton Ironworks, Glasgow. It occupies a raised position in the centre of the circus formed by the intersection of the six thoroughfares. The pedestal of the "Sidney" column,—for that is the name which it now bears,—is about 3 ft. square, with ornamental plinth, standing upon a Portland stone base, surrounded with a granite stone kerbing, the space between the kerbing and the base being filled with patent vitrified paving bricks, supplied by Mr. Joseph Hamblet, of West Bromwich, laid in radiating panels, thus forming an excellent platform, 12 ft. in diameter, for persons desirous of using the fountain, or as a refugee from the street traffic. At each side and at the top of the pedestal are four elegant semicircular troughs, for the purpose of receiving the waste water and to prevent splashing. These intersect immediately under the heads of four gracefully-moulded dolphins, forming the corners of a very pleasing base to the lamp-column above. The height of the light above the roadway is 22 ft. The painting and gilding have been executed by Mr. C. Vaughan, of Southampton. The whole of the work has been carried out under the supervision of the Borough Surveyor of Southampton (Mr. W. B. G. Bennett).

The Work done in a Technical School.—There is now on view in one of the rooms of Gresham College, Basinghall-street, a small but interesting collection of specimens of handwork executed by some of the pupils of the Technical School at Iserlohn, in Westphalia. They have been sent over at the instance of Mr. Philip Magnus, Director of the City and Guilds Institute, and one of the Royal Commissioners on Technical Education, as illustrating the work done in the numerous schools of the kind which exist throughout Germany by apprentices and "improvers" in various handicrafts. Some of the work shown is very good indeed, especially when it is remembered that the workers are mostly lads of from thirteen to nineteen years of age. The specimens include modelling in clay and wax, wood-carving, metal-chasing, and turning in wood and metal. The exhibition will remain open daily from ten to four up to and inclusive of Wednesday next, the 26th inst., and will be found worth visiting by some of our readers.

A new Mission Chapel has just been opened at Leckhampton, Cheltenham, from designs by Messrs. Chatters & Channon.

Proposed Cemetery for Newington.—At the last meeting of the Newington Vestry a letter was received from the Burial Board, informing the Vestry that for some time past they had been taking steps to find a suitable site for a burial-ground for that parish. During the past ten years they had reviewed several plots of land, but the situation of these sites and the price of them were such that the Board did not think it advisable to submit any of them to the consideration of the Vestry. Very recently they had had their attention called to some land on the high road to Croydon, consisting of 46 acres,—the area required by the Act,—and this land could be readily adapted for the requirements of a cemetery. The owner was willing to take 29,000*l.* for the land; but the whole of the frontage might hereafter be disposed of for building purposes. This would realise 6,000*l.*, and would reduce the cost to, say, 23,000*l.* A further expenditure of 6,000*l.* would be required for boundary-walls, chapels, and laying out the ground. There would also be the cost of maintaining a staff; but it should be remembered that for this outlay the Board would receive fees for interments. If the parish possessed a cemetery, and the same inducements were offered to the bereaved to bury their dead there as existed in other parishes, there would be no less than 1,500 interments in the course of the year. Supposing the fees charged to be on the same scale as in Lambeth and Camberwell, the receipts would amount to 1,800*l.* or 2,000*l.* per annum. A rate of ¼d. in the pound would be required for the first four years, and they reminded the Vestry that some such provision would have to be made before long. Mr. Sylvester wished to know if the offer of the land treated it as agricultural land or building land. [Mr. Churchwarden Chester: As building land. If we do not take it, it will be taken up by other persons.] It was resolved to defer the consideration of the scheme until the next meeting of the Vestry. The parish, unlike its neighbours, Camberwell and Lambeth, is without a cemetery of its own.

Proposed Town-hall for Lambeth.—At the last meeting of the Lambeth Vestry, Mr. F. H. Fowler moved, "That a select committee be appointed to consider the propriety of obtaining a new Vestry-hall with the necessary offices." He observed that all who had to attend the present Vestry-hall in the discharge of their parochial duties were aware of the very inadequate accommodation which the building offered for almost every purpose. While other parishes had borrowed money from the Metropolitan Board of Works for the purpose of building large edifices for the use of the Vestry and the inhabitants, Lambeth had contented itself with its old Vestry-hall, and its associated discomforts of bad ventilation and insufficiency of accommodation. There was no library in the building, and the consequence was that if a member wished to get up information respecting any subject, whether it related to the School Board, the Asylums Board, or any other board, he had no means of doing so, inasmuch as the hall contained no books of reference. He thought that Lambeth, the largest and most influential parish on the south of the Thames, ought to have a proper Vestry or Town Hall, where public meetings might be held when occasion demanded, and where local representatives might meet with comfort to themselves and with credit to the great and important parish in which they lived. He concluded by moving the resolution. Mr. Doubleday seconded the motion, and said he felt quite sure that a Town-hall would pay in the long run a profit of 1,000*l.* or more every year. The motion was carried, and a committee nominated to consider the matter.

Statue of Mariette Bey in Boulogne.—A statue to Auguste Mariette, better known as "Mariette Bey," was unveiled on the 16th inst. in Boulogne, where the distinguished Egyptologist was born in 1821. It is erected on the Esplanade skirting the ramparts of the Haute Ville, looking to the Sous-Préfecture, and stands upon a base consisting of a pyramid upon the sides of which are inscribed the names of Mariette's principal discoveries. The town was *en fête* on the occasion of the ceremony. The citizens of Boulogne, in honouring the memory of Mariette, have conferred honour upon themselves.

Competition.—The plans submitted (in competition) by Mr. T. Searancke Archer, of 2, Gresham-buildings, have been selected for the new swimming-bath, &c., to be built at the Royal Masonic Institution for Girls.

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The Society of Chemical Industry.—The annual meeting of the Society of Chemical Industry was held on the 5th inst. at the Owens College, Manchester, Professor Roscoe, the president, in the chair. Professor Roscoe said that they had now 1,140 members on the books, English and Continental scientific and professional chemists. Last autumn two sections of the society were formed, and during the winter had been in active working, the metropolitan portion under Professor Abel and that in Liverpool under Mr. E. K. Muspratt. Speaking of the importation of manufactured colours, by which we lost the profit on an industry of three millions annually, he said the Germans and the Swiss were still distinctly before us, not only in the means of obtaining the highest technical training in their universities and polytechnic schools, but, what was even more to the point, before us in the general recognition of the value and importance of such training and the successful prosecution of any branch of applied science. However, although England was apt to be late in taking up such views, she was, as Mr. Forster said, generally not too late, and the recent establishment of colleges and technical schools, as well as the appointment of the Royal Commission on Technical Education, to which he had the honour to belong, showed that the country was now alive to the necessity of the case.

Land, Chiswick.—Mr. Walter Hall, Land Agent, of No. 28, Southampton-buildings, Chancery-lane, has sold in one lot the whole of one side of the Barrowgate-road, Duke's-avenue, Chiswick, just outside the gates of Chiswick House, the property of the Duke of Devonshire. The estate, which comprises five acres of valuable building land, having a magnificent frontage, was advertised in our columns for sale by auction on Tuesday last, but in consequence of an offer being made on the morning of the day fixed for the sale, the property was sold privately at a price which, we learn, was sufficient to induce the owners to forego the chances of an auction-room.

Ladybank (N.B.).—The new parish church was opened for public worship on Sunday last. The plans of the structure were prepared by Mr. Walker, architect, Circus-place, Edinburgh, and are Gothic in design. The site is the most conspicuous in the centre of the town, and consists of an acre, one-fourth of which is taken up for the church and three-fourths are held in reserve for the manse. The church is seated to hold 400 in the area, while a gallery can be erected at any time to accommodate 107 more. The walls are of freestone.

Ventilation.—Messrs. Robert Boyle & Son's system of ventilation is the one applied at the Police Orphanage, Twickenham, a new wing of which was opened on the 8th of July by H.R.H. the Prince of Wales. Messrs. Boyle are also to ventilate the new Royal Courts of Justice Chambers at present being erected in the Strand, their plan being the one accepted.

Social.—On the 8th inst. the *employés* of Messrs. G. H. & A. Bywaters made an excursion to Hastings, where 130 sat down to dinner at the Castle Hotel, Mr. Taylor presiding. The senior member of the firm, Mr. George Bywaters, was present, and expressed the pleasure it always gave him and his brothers to meet them on such occasions as that.

TENDERS

For the restoration of the parish church, Ashburton, Devon. Mr. A. E. Street, M.A., architect:—

Stephens & Bastow, Bristol	£6,254 0 0
Stacey & Rabbage, Newton Abbot	5,950 0 0
Booth & Sons, London	5,889 0 0
R. J. Crocker, Bedminster, Bristol	5,752 10 0
Wall & Hook, Brimscombe, Gloucester	5,718 0 0
H. Stevens, Ashburton	5,710 14 4
Wilkins & Sons, Bristol	5,670 0 0
W. Gibson, Exeter	5,643 0 0
W. A. Goss, Torquay	4,800 12 0
W. Crocker, Torquay	4,600 0 0
P. Blowey, Plymouth	4,320 0 0
R. Davis, Newton Abbot	4,183 0 0
J. H. Foaden, Ashburton	3,822 16 3
E. Abley, Salisbury	3,726 4 4

For rebuilding the Jane Shore Public-house, Shoreditch, for Mr. E. J. Rose. Messrs. Wilson, Son, & Aldwinckle, architects, 2, East India-avenue, Leadenhall-street. Quantities supplied:—

Hall, Beddall, & Co.	£1,950 0 0
Mills	1,937 0 0
Beale	1,896 0 0
Croaker	1,869 0 0
Jarvis & Son	1,835 0 0
Shurmur	1,755 0 0
Hearle & Son	1,723 0 0
Cox	1,686 0 0

For repairing, cleaning, and painting the chapels, lodges, and mortuary, and for altering the iron entrance-gates at the Tooting Cemetery, for the Lambeth Burial Board. Mr. Harley M. Grellier, surveyor, 17, Abchurch-lane:—

Ackermann	£769 0 0
Lee	521 0 0
Hudson	450 0 0
Gibbin	449 10 0
Robinson	435 0 0
Maplesden	395 0 0
Ford & Sons	365 0 0
Mills	315 0 0
Le Gassick & Co.	305 0 0
Hammond	260 0 0
Dormer	247 10 0
Richens & Mount	247 0 0
Collins	237 0 0
Swain	229 0 0
Dunsford & Clitter	210 0 0
Hunt & Challis (accepted)	198 0 0

For the erection of house, at Bromley, for Mr. G. C. Verrall. Mr. Chas. Bell, architect. Quantities by Mr. Henry Lovegrove, 26, Budge-row, E.C.:—

Went & Bowen	£1,459 0 0
Gregor	1,400 0 0
Arnard	1,355 0 0
Eldridge & Gee	1,330 0 0
Goad	1,325 0 0
Niblett	1,298 0 0
Sharpe	1,285 0 0
Palmer	1,290 0 0
Payne	1,273 0 0
Holliday & Greenwood	1,237 0 0
Kennard	1,230 0 0
Smith	1,198 0 0
Green (accepted)	1,127 0 0

For the erection of residence and training establishment at Newmarket, for the Right Hon. the Earl of Zetland. Mr. W. J. Moscrop, jun., architect, Feethams, Darlington. Quantities by Messrs. Clark & Moscrop:—

	Stables (exclusive of Mangers, &c.)	House (exclusive of making road).
J. L. Green, London	£5,456 0 0	£2,095 0 0
Priestly & Gurney, London	4,790 0 0	2,089 0 0
Thos. William, Newmarket	4,829 0 0	2,064 0 7
J. P. Groome, London	4,107 0 0	2,816 0 0
W. J. Wilson, Bishop Auckland	4,547 10 11	1,941 7 6
Geo. Grimwood & Son, Sudbury	4,450 0 0	1,810 0 0
G. W. Booth & Son, London	4,200 0 0	2,000 0 0
F. P. Trewicke & Co., London	4,165 0 0	2,018 0 0
Wm. Rednall, Bury St. Edmunds	4,385 18 0	2,040 15 8
Geo. Thackray & Son, Huntingdon	4,127 10 0	1,788 6 0
Harris & Sons, Tunbridge Wells	3,928 2 3	1,695 6 1
A. & W. Harris, Edinburgh	4,121 0 0	1,729 11 0
Turtle & Appleton, London	4,208 17 10	1,863 14 5
G. Worboys, Royston	4,086 14 0	1,743 16 0
Alex. Thompson, Gateshead	3,892 7 6	1,695 14 5
Jas. W. Bray, Yarmouth	4,039 5 11	1,743 15 3
J. R. Denson, Cambridge	4,077 17 0	1,900 8 0
Redding & Son, Cambridge	3,897 1 10	1,717 3 0
Geo. Marshall, Darlington	3,918 11 0	1,710 2 4
Hook & Tebbitt, Soham	3,814 2 1	1,697 3 9
J. Sharman, London	3,517 4 1½	1,436 15 7
Wilkes Bros., London and Newmarket	3,757 0 3	1,654 5 3
J. Cawell, Soham	3,498 0 0	1,724 13 0
Waters & Feat, Ely	3,457 9 6	1,532 3 6
R. S. Smith, Ipswich	3,758 18 10	1,620 6 7
Mason & Son, Haverhill	3,512 5 4	1,672 12 2
W. Bell & Son, Cambridge	3,520 0 0	1,554 0 0
Samuel Redhouse, Baldock	3,455 9 9	1,524 10 1
J. Sains & Son, St. Ives	3,430 0 0	1,570 0 0
H. H. Wallis & Son, Spalding	3,183 0 0	1,551 0 0

For painting, whitewashing, cleaning, &c., at St. Olave's Union Infirmary, Rotherhithe, for the Guardians of the Poor of the St. Olave's Union. Messrs. H. Saxon Snell & Sons, architects:—

Smith & Barnes	£1,070 10 0
Batchelder	963 0 0
Morris	960 0 0
Bamford	945 0 0
Stevens	819 0 0
Cracknell	650 0 0
Brockwell	630 0 0
Stevenson (accepted)	495 0 0

For the erection of a chapel, mortuary, and lodge for the Hampton Burial Board. Quantities supplied by the architect, Mr. R. T. Elsam:—

Piller	£1,054 0 0
Ware	1,025 0 0
Wheatley	1,012 15 9
Bonell	1,010 0 0
Capsey	1,000 14 7
Oldridge	979 0 0
Hiscock	946 0 0
Collinson	902 0 0
Everett	895 15 8
Harris*	725 0 0

* Accepted for chapel and lodge only at £620.

For the erection of offices, Rochester Buildings, Leadenhall-street, for Mr. Stuart Knill. Messrs. Wm. Hudson, Son, & Booth, architects, 19, Bennet's-hill, E.C. Quantities by Mr. Wm. Birdseye:—

Merritt & Ashby	£25,000 0 0
D. King & Son	24,000 0 0
Hall, Beddall, & Co.	23,972 0 0
J. & J. Greenwood	22,797 0 0
Kirk & Randall	22,687 0 0
Ashby & Horner	22,270 0 0
Perry & Co.	22,112 0 0
Jas. Morter	21,983 0 0
Colls & Sons	21,950 0 0
Wm. Brass (accepted)	21,625 0 0
Founders' and Smiths' Work.	
Rownson, Drew, & Co.	£2,355 10 6

For the erection of Portland offices and muniment-room, Queen Anne-street. Mr. Charles Fowler, architect. Quantities by Mr. H. Lovegrove:—

J. Woodward	£3,220 0 0
Williams & Son	3,182 0 0
J. R. Hunt	3,126 0 0
Nightingale	3,030 0 0

For making new roads, Eldon Hill Estate, Swanage, Dorset. Mr. R. G. Pinder, surveyor, Avenue-chambers, Bournemouth:—

Saunders & White, Bournemouth	£245 0 0
H. Burt, Swanage	220 15 10
H. Pond, Corfe Mullen	195 0 0
S. Saunders, Lower Tooting (accepted)	147 8 9

For making, forming, and draining a road at Matlock Bath, for the Matlock Bath Pavilion and Gardens Company (Limited). Mr. John Nuttall, architect, Matlock Bridge. Quantities by Mr. F. S. Smith, 14, St. Ann's-square, Manchester:—

Wm. Askew (accepted)	£1,066 3 0

For alterations and decorative repairs to a mansion at Wandsworth Common. Mr. D. Ruddle, 85, St. Martin's-lane, architect. Quantities by Messrs. Strudwick & Mennie:—

Eyears & Sampson, Kennington (accepted).

For repairs and alterations at 72, Tottenham-court-road, for Messrs. Nodes Bros. Mr. R. H. Burden, architect:—

Titmas	£979 0 0
Scrivener & Co.	839 0 0
Wilson & Exton (accepted)	800 0 0
McCormack & Son	627 0 0

For repairs to and decorating of Vicar-lane Chapel, Coventry. Mr. William Tomlinson, architect, Coventry:—

Repairs.	
Storer	£310 0 0
Hallam & Co.	80 0 0
Jephcott	43 0 0
Blakeman	36 0 0
Cleansing and Decorating.	
Mander	£179 0 0
Johnson	160 0 0
Wetton	138 0 0
Shaw	120 0 0
Smith	96 0 0
H. Whiteman, Coventry (accepted)	64 0 0

For organ and other works, Finsbury Park Wesleyan Chapel. Mr. F. Boreham, architect:—

Morter	£684 0 0
Gregar	667 0 0
Goodman	660 0 0
Roberts Bros.	644 0 0
Hobson	639 0 0
Dove Bros.	625 0 0
Richards & Son (accepted)	549 0 0

For building a mansion, for Mr. G. Scott, at Wimbledon. Mr. Chas. Ball, architect. Quantities by Mr. Gilbert Jones:—

Lucas	£13,767 0 0
Baker	13,610 0 0
Waller	13,495 0 0
Smith & Troy	13,430 0 0
Peters & Co.	13,410 0 0
Perry	13,400 0 0
C. H. Sharp	13,389 0 0

For alterations and additions to a house, Stamford-hill, for Mr. Batram. Mr. C. Ball, architect. Quantities by Mr. Herbert Young:—

Holloway	£760 0 0
C. H. Sharp	745 0 0

For the erection of a dwelling-house, with gateway, adjoining No. 140, Abbey-street, Bermondsey, for Mr. W. Wilkins. Mr. E. Crosse, architect, 32, Bermondsey-square:—

B. Wells	£313 0 0
Friggens	295 0 0
Winson	290 0 0
Russell (accepted)	230 0 0

For detached residence and stabling at Southgate, Middlesex, for Mr. W. Street. Mr. C N. McIntyre North, architect:—

Downs	£3,044 0 0
Josolyne	2,990 0 0
Woodward	2,940 0 0
Richardson Bros.	2,796 0 0
King	2,747 0 0
Cox	2,671 0 0

For alterations at 10A, East-street, Brighton, for Messrs. H. Sharp & Co. Mr. J.G. Gibbins, architect, London and Brighton:—

W. & T. Garrett	£460 0 0
James Barnes	436 0 0
G. R. Lockyer	427 0 0
G. Cheesman & Co., Brighton*	340 0 0

* Accepted.

For alterations and additions to St. Luke's Church, Prestonville, Brighton, for the Rev. George Hewitt. J. G. Gibbins, architect, London and Brighton:—

G. R. Lockyer	£1,690 0 0
G. Cheesman & Co.	1,650 0 0
W. & T. Garrett	1,329 0 0
James Barnes, Brighton (accepted).	1,280 0 0

For alterations to lavatories, new baths, and interna and external painting, &c., Royal Naval Schools, New Cross. Mr. A. B. Hutchings, architect:—

Hoskins, Westminster (accepted).

For alterations, back additions, and decorating to Red House, Catford Bridge, for Mr. Leopold McKenna:—

Hoskins, Westminster (accepted).

For repairs, alterations, painting, &c., to nine houses Norland-road, Shepherd's Bush. Messrs. Driver & Co., architects:—

Hoskins, Westminster (accepted).

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For Welsh Wesleyan Chapel and artisans' dwellings, City-road. Messrs. Wilson, Son, & Aldwinckle, architects, No. 2, East India Avenue. Quantities supplied :—

Nixon	£9,997 0 0
Hobson	8,849 0 0
Dove Bros.	8,625 0 0
Staines & Son	8,384 0 0
Williams & Son	8,070 0 0
Roberts & Co.	7,988 0 0
Hall, Beddall, & Co.	7,880 0 0
Mowlem & Co.	7,800 0 0
Bywaters	7,775 0 0
Woodward	7,750 0 0

For building house and shop, Gloucester-road, for Mr. W. Follett. Mr. George Edwards, architect. Quantities by Mr. H. Lovegrove :—

		Allow for old bricks.
Clarke & Mannooch	£4,636	£160
Lucas & Son	3,830	145
Bywaters	3,669	120
Smith	3,650	90
McLachlan & Sons	3,630	126
Scrivener & Co.	3,625	144
Goad	3,485	130
Stimpson & Co.	3,480	120
Holliday & Greenwood	3,437	135
Green (accepted)	3,083	140

For rebuilding No. 20, King's-road, for Mr. W. F. Bates. Mr. George Edwards, architect. Quantities by Mr. H. Lovegrove :—

Clarke & Mannooch	£1,524 0 0
Crapper	1,338 0 0
Crasks	1,258 0 0
Canning & Mullins	1,170 0 0
Scrivener & Co.	1,143 0 0
Scharien & Williams	1,132 0 0
Cocks	1,128 0 0
Martin Wells & Co.	1,128 0 0
McLachlan & Sons	1,120 0 0
Williams	1,116 0 0
Goad	1,112 0 0
Stimpson & Co.	1,030 0 0
Green (accepted)	1,005 0 0

For alterations and additions to Alma Villa, Bromley, Kent. Messrs. Snooke & Stock, architects, Duke-street, London Bridge. Quantities supplied :—

Greenwood	£1,025 0 0
Ryder & Son	1,018 0 0
Pritchard	982 0 0
Crossley & Son	955 0 0
Arnoud	943 0 0
Balding	880 0 0

For the erection of a villa, Dartmouth Park-hill, near Gospel Oak, for Mr. A. C. Engert. Messrs. Hills & Fletcher, architects :—

Corrick	£2,865 0 0
Martin	2,060 0 0
Grover	1,972 0 0
Jolliffe	1,780 0 0
Toms	1,773 0 0
Russell	1,745 0 0
Salt (accepted)	1,620 0 0

For the erection and completion of a detached residence, at Sevenoaks Park, Kent, for Mr. Butler. Mr. Edwin T. Ball, architect :—

J. O. Richardson (accepted)	£2,500 0 0

For the erection and completion of a villa at Auckland-road, Upper Norwood :—

Hitchcock	£3,190 0 0
Steer	2,550 0 0
Garnham & Sons	2,417 0 0
Gallidge & Stewart	2,400 0 0
Ockenden	2,268 0 0
J. O. Richardson	2,225 0 0

For the restoration of Haroldston West Church, Pembrokeshire. Mr. E. H. Lingen Barker, architect :—

Lloyd & Roberts, Haverfordwest	£548 0 0
Jenkins, Camrose	463 12 0
Reynolds, Haverfordwest (accepted)	349 15 0

For the rebuilding of No. 488, Bethnal-green-road, for the Rising Sun Property Association. Messrs. A. & C. Harston, architects :—

B. T. Wood	£790 0 0
Edwards	750 0 0
Beal	720 0 0
Wire	710 0 0
Thomerson & Son (accepted)	675 0 0

For the erection of Sunday schools, Walthamstow. Mr. W. T. Seth Smith, architect. Quantities by Mr. John Leaning :—

Crabb	£2,818 0 0
Lynd	2,730 0 0
Priestly & Gurney	2,700 0 0
Castle	2,631 0 0
Goddard & Son	2,530 0 0
Julian & Co.	2,490 0 0
Gentry	2,360 0 0
Reed	2,335 0 0
Thomerson & Son	2,269 0 0
Good	2,176 0 0

For painting, &c., at Trinity Church, Southwark-street, for the Churchwardens. Messrs. Henry Jarvis & Son, architects :—

Downs	£157 0 0
Joselyne	119 0 0
Croaker	105 0 0
Brazier	49 10 0

For erection of bank and alterations to stabling at Asgill-lane, Richmond, for the London Parcels Delivery Company, Limited. Mr. W. Seckham Witherington, architect, No. 79, Mark-lane :—

F. & R. Vigor	£637 0 0
Carman	538 0 0
Sims	490 0 0

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All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

NOTICE TO SUBSCRIBERS.

THE INDEX and TITLE-PAGE for Volume XLII. (January to June, 1882) were given as a Supplement with the Number for July 8.

A COLOURED TITLE-PAGE may be had, gratis, on personal application at the Office.

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On Quoins and some Questions collateral.

NOUGH was probably said in the article on "Taste in Brickwork" (June 17), as to the natural propriety of the end or angle of a brick wall being emphasised as a termination. This is merely an application of what may be admitted as an architectural axiom, that every structural transition naturally receives, if it should not be said rather to naturally demand, acknowledgment by visible differentiation, by accentuated outline, or expressive moulding. A sudden termination of a wall-curtain is a more decisive case of interruption, which is equivalent to transition, than simple change from one member to another,—as from shaft to capital, or from frieze to cornice. We have seen how the blind exigencies of construction introduce a certain difference by the interposition of the fragmentary brick, "the closer," at the end of a course, which answers its immediate purpose at the expense of weakening expression. The problem is even so forced upon us, how the exigency can be provided for in a manner to conciliate the requirement of enhanced expression of vigour. Of this problem there is one solution yet to specify even as regards pure brickwork, while it is equally applicable to proper masonry. This consists in the advance of the work for a limited breadth beyond the general plane of the wall; by this means a vertical line is obtained which, by the usual effect of well-managed repetition, whether in rhetoric or brickwork, strengthens the expression of what it manifestly insists on, in this case the vertical line of the end or angle. By such an emphatic pronunciation the disturbing suggestion of a cessation that is unprepared for, if not unexpected, and therefore liable to be violent, is precluded. Here, again, the Greeks, as in so many other cases, are our masters and instructors, and nowhere better than in that peculiarly complex structure the Erechtheum. The flank-walls of this temple on either side eastward are finished by a slightly projecting return of the anta, which answers to an angle column of the eastern portico, and, by predominance of verticality, brings the uniform horizontal progression of the courses of masonry to an authoritative pause or stop. The western anta of the north portico returns not upon a flank wall, but upon the end of a wall, upon the opposite side of which it is repeated in a position where it cannot, as having no column to answer to it, be strictly entitled an anta; the ornamental mouldings of both are made continuous, alike at summit and base, by extension across the narrow recessed end of the wall between them. Still another variation of the thoroughly organic union of anta and wall is given at the angles of the engaged colonnade of the western front. In some of these examples we have an anticipation of the principle and the beautiful effect of the compound pier of later ages. In all of them we observe that the wall seems spontaneously to develop into a new adjustment to accommodate a new exigency, even as in a natural growth a reed-stem thickens towards the bulge of a node. Organic modification of such a type is very different indeed in effect from the unhappy Roman invention of the pilaster, which, especially as employed by Palladio and his imitators, justifies the accurately descriptive words of Pope already quoted, and appears as nothing better than a thin slice stuck upon a wall, and as little capable of standing independently of it as of asserting a true structural adherence. A pilaster is seldom more objectionable than when it is employed in a vain hope of making use of its services near an angle; the wall, when allowed to reappear at the angle, will assert itself as having passed uninterrupted behind flat slabs beyond which it is emergent. Inigo Jones fought against the difficulty by setting coupled pilasters at the angles of the upper story of Whitehall, but he does not come out altogether a conqueror. The wall still appears stronger than his pilasters, which, in consequence, are only slightly less conspicuously otiose than usual. When the masonry is executed with rustic joints, the fictitiousness of any aid to be ascribed to the pilaster is self-declared, and its pretentions to constructional union are visibly repudiated. This characteristic needlessness clings to the pilaster; it is no objection to it when employed confessedly decoratively, on a small scale, or in mere furniture, but where proper architectural responsibility is in question, the pilaster may usually be most prudently dismissed,—most conscientiously denounced. It may be thought to be most endurable when, as we sometimes see it, it embraces an angle; and, in this case, it, at any rate, most nearly personates an unobjectionable pier; but, in truth, even so it only becomes equivocal, either in its own or a different character, and is neither one thing nor another; to become consistent it must divest itself of those proportions; it would be well if it also escaped from the specific capital, which declares it to be a column modified for the worse, and incongruously prompting suggestions of an independence which it is no longer capable of, but that is of the very essence of the character of a column. There is as little to be said in favour of distinct pilasters adjoining at right-angles and making the corner of the building a re-entering angle; the incongruous seems to reach its acme when a column scarcely engaged in the wall, and at a trifling interval from the pilaster, obtrudes its assistance, but only contributes to aggravate an ill-articulated huddle.

These are hard words, but the student may be trusted to verify them by observation or recollection; or let him, indeed, turn for illustrative examples to what is always a welcome reference, Fergusson's "History of Modern Architecture." The Library of St. Mark at Venice is the masterpiece of Sansovino at Venice, and it is with some touch of remorse that any disparaging reflection is made upon a building which has been regarded time after time with so much delight. Yet this pleasure was not unqualified by objections, which return in force at the sight of Mr. Fergusson's illustration at page 96 of his work. On both upper and lower arcade, column, pilaster, and wall are grouped, but cannot be said to be combined, at the angles, and the weakest member is nearest to the angle, and both entablatures finish on their weakest member. The artist was evidently unsatisfied with his work up to this point, and became conscious that more decisive emphasis was required. The stratagem of reinforcement which he resorted to scarcely fulfils his intention. Each angle of the cornice is surmounted by a lofty pinnacle, but this, in its isolation, has the unfortunate effect of rather insisting on the independence of the pilasters below it, which the entablatures had in some degree succeeded in combining with their associated columns. It was a wise hint, given by the most eloquent public speaker of our day, that it is always well, before beginning an oration, to have a well-settled scheme how it is to be concluded; this being more important for ultimate effect than even the most skilful arrangement of transitions from one leading topic to another. Architects, like orators, it may be thought, have been too frequently content to leave terminations to reconcile themselves with the central treatment as best they might. Even the Vandramini Palace at Venice (p. 93), and the Pesaro (p. 98) still less, does not fully recognise the claim of the bounding vertical line at the return of a façade to distinctly specialised emphasis.

In the so justly admired Grimani Palace (p. 27), it is only when seen from the angle that the weakness of the terminal coupled columns, as compared with their associates towards the centre, is not objectionable. Palladio is a serious offender in the way of the faults which we have been denouncing. His Valmarina Palace at Vicenza (p. 28) combines them in every form, but much is to be forgiven to him for the sake of the glorious arcades of his town-hall in the same city, where the diffi-

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culty in question is so fairly recognised and grappled with as to disarm criticism. "If, indeed," says Fergusson, "all Palladio's designs were as beautiful and appropriate as this, we should have little fault to find, either with the style he adopted or his mode of applying it" (p. 117).

The strengthening expression which is given to Giotto's campanile at Florence by the octagonal projections at the angles is the saving of a design which otherwise was in danger of appearing even insecure from associations of flimsiness with superficial ornamentation, from its tallness unrelieved by expansion towards the base, and from the excessive solidity of the unpierced portion at the summit. What happy effect may be due to a simple rectangular projection at the angles, will be seen by comparing Fergusson's "Illustration of the Campanile of S. Andrea, Mantua," with that figured after Street on the opposite page (224) from the Palazzo Scaligeri at Verona. The chief objection to such projections in simple brickwork is that they too obviously imply a vertical joint or what seems a continuous vertical joint at the junction with the face of the wall. This is by no means a fatal objection, but, such as it is, it is evaded by the invention of quoins as constituents of a finishing member.

The simplest problems in the employment of stone quoins to accentuate angles and complete the framing in of a façade, are presented in constructions of pure masonry. In such a case where a wall presents stretchers uniformly, the alternate longer quoin will overlap half a stretcher, but what additional length is conceded to it must depend on various considerations of propriety and taste. It may only be as long as the ordinary stretcher, and left to assert individuality by exceptional projection beyond the plane of the wall; but in this case the shorter quoin will be restricted to half the length of the same modulus. Whether this is objectionable will depend in some degree on the form of the stretcher,—the proportion of its height to its length; and its absolute dimensions will also have to be taken into account. In such construction the breadth of the shorter quoin will inevitably carry a suggestion of the thickness given to the wall of which it is the only evidence. The effect, therefore, can scarcely but be unfortunate if its absolute dimensions are mean and insufficient in this relation. If again it is exactly square, which it will be if, under the supposition, the proportion of the stretcher is a double square, another inaptness will accrue. The sense of repose which it is the very purpose of a border of quoins to conciliate, will be disturbed when it appears that they would not pile independently even as securely as the ordinary blocks. The eye will insist on pausing upon the quoins in their relation to each other, and no boldness of projection will compensate for even a vague suggestion of liability to topple.

This suggestion will be still more readily provoked if, while the shorter quoin presents an exact square, the longer above it is either shorter or much longer than a double square. If it is much longer it will suggest overbalance, and if shorter it will contribute to the instablity of slenderness. Therefore it is that it will be found to be, that it will be observed to be, for the interests of repose by those who will have regard to executed examples, that the shorter quoin should be somewhat longer than the ordinary stretcher, and the longer have but moderate projection beyond it. But it will be observed that the projection of the longer quoin in relation to its height will ultimately be governed by the dimensions of the ordinary stretcher, of which it has to cover exactly half, unless a variation is made at this point, which is not desirable. In consequence study, it would seem, has to be given in the first instance to the most effective proportions of the system of quoins before the oblong face of the masonry blocks is resolved on, even if, upon making comparisons, certain concession may seem desirable from either side.

In the ordinary process of masonry development, the quoin, which is short in front, is long on the return; and in like manner the long quoin in front shows as short on the other side. Some effects result which are uncomfortable, that is, to recur to our primary consideration, which vitiate repose. It is appropriate that a long quoin should be the base of the system, but the propriety holds good for both sides of the angle of the building; again, it has the better effect for a short quoin to be surmounted by a frieze or a broad string-course, and again, the effect is secured on one side, only to be visibly forfeited close at hand on the other.

This mischief is at its minimum when even the shorter quoin has a length considerably in excess of its height, but, even so, it is far from being obliterated; the reversal of sequence when the quoins are viewed from the angle is most disturbing, and especially where upon one face a plat-band or a frieze of necessity rests upon a short quoin or a short quoin is immediately superimposed upon a base line. This difficulty, of course, does not occur when the return of the wall is masked and the quoins are only visible on one face, but otherwise a difficulty it is, which will have its effect in a certain unsettlement of the desirable impression of perfect coherence and solidity, whether the spectator, whose satisfaction is thereby reduced, may be aware or not of the seriousness of his loss, or of the quarter in which the peccant incongruity originates. The remedy obviously lies in the direction of an exact duplication, of making the longer and shorter quoins on one side continuous with longer and shorter on the other; then the system on both sides of the angle will rise from a long quoin, and so also conclude as may be desired. It is needless to say that a variety of proportionate adjustments will be required to secure the harmonious combination of such a system with the general design and also with other details of construction; these cannot be entered upon here where the immediate concern is the discussion, not of practice, but of principles, that practice will do well to be observant of, for it will have to acknowledge sooner or later that they are its masters. It may be observed, however, that the same propriety will control the dimensions of the angle blocks of simple rusticated masonry without quoins, the longer showing as longer, and the shorter as shorter on both faces.

The predominant form of the quoin is liable to fall into comparison spontaneously with that of the general façade, or more immediately of a special story,—a direct contradiction as between a very square general outline of façade or story, and a very flat oblong of the quoin, or *vice versâ*, will assuredly tell us a violent discord. It is more important to observe this from the relation which we have seen between proportions of quoins and of the blocks of the general masonry; it is manifest at a glance how the long front of the Pitti Palace is harmonised by the long proportions of the vast stones, not only of the colossal basement, but of the general construction. The majestic Farnese Palace at Rome exemplifies the admirable effect obtainable by the successive variation of quoin, both in magnitude and proportional forms between basement and upper stories. We observe even the refinement of gradually reducing the thickness of the quoins of the lower story as they approach its cornice-like string-course, as if on the principle of the diminution of a column; a transition is thus softened to the reduced system of quoins of the story above, but the licence requires justification; it would scarcely be agreeable when masses less imposing were to be dealt with.

The variation of the heights of quoins from from one story to another involves corresponding change in the courses of masonry, which on their part are consistently reduced in the case of very large structures, in harmony with the reduced height of the stories. By this means quoins may give distinct yet gracefully reserved intimation of what is more forcibly pronounced, and still most effectively in the entirely rusticated façades of several of the finest palaces at Florence.

The combination of the stone quoin with brickwork has led to many an architectural misadventure. Here, of course, the height of a particular course exercises none of the control which it asserts in the case of masonry. The question merely arises,—How many courses of bricks shall be responded to by the height of a quoin? There is no escape from the primary difficulty that no true bond can be expressed or understood between the quoins and the brickwork; proper union or tie is vitiated by the continuous joint through several courses where the bricks meet the deeper masonry. This fault is aggravated by every increase in the number of the intermediate courses, and at the same time the visible increase in the relative weight of the quoins makes the inconsistency of associating the two kinds of work still more palpable. The very strength of the masonry causes the brickwork to appear flimsy by contrast, and liable to the same catastrophe which is proverbially threatened by a new and strong patch upon a weak material. When this objectionableness is obviated in the best way, and to the greatest extent, that the case admits of, the only resource for helping out the harmony of the two constructions seems to lie in assigning a form to the quoin of which the proportions of height and length fall into some easy gradation with those of the particular type of brick which is associated with it. A brick of a somewhat, or more than somewhat, flatter proportion than is usually employed, would be favourable to that degree of flatness in the quoin which would seem to give it best hold on the brickwork; such a brick, it may be added, would give a degree of refinement to the general work which strikes us on a visit to some Continental cities,—even to the Hague, and of which the explanation, at first enigmatical, can never escape our regard after it has once been divined.

THE RESPONSIBILITY OF BUILDING OWNERS FOR THE NEGLIGENCE OF THE CONTRACTORS' WORKMEN.

WHEN the well-known case of Bower *v.* Peate was decided in 1876 it undoubtedly introduced a most important exception to the well-known legal principle, that if a man employs a competent contractor to do work for him who, by the negligent way in which the work is done, causes injury to the property of a third person, he is not liable. For, as probably many of our readers are aware, the exception which was introduced by Bower *v.* Peate was to the effect that one who orders work to be executed from which, in the natural course of things, injurious consequences to his neighbour must be expected to arise, is bound to see that proper care is taken in the execution of the work, and he will be liable for want of such proper care. This exception has seriously increased the responsibilities of many persons who order work to be done which is at all liable to injure adjoining property, and considering the nature of much town work, it requires no unusual knowledge to understand the danger incurred by many innocent persons. A recent case, one which we have chronicled briefly in our columns, is now reported in the regular law reports, and it shows that the courts have made this exception wider than it was under the previous decision. We are referring to the case of Percival *v.* Hughes, 51 *Law Journal* Reports, Queen's Bench Division, p. 388, which contains an important judgment of the Court of Appeal. The main effect of that decision is to apply the exception contained in Bower *v.* Peate to the whole job, so to speak, on which the contractor is employed, and not to those parts of it which are clearly likely to cause injury to the property of another if great care and precaution be not taken. Of course, if A and B are two adjoining house-owners, and C, a competent contractor, is employed by B to do work on, we will say, the foundations of the house, and his workmen are so careless that they injure A's property, it is exceedingly hard upon B that he should have to pay damages if A sues him. C is more properly the person to bear the consequences of this injury; yet, again, C may say that having obtained the services of a competent workman, it is equally hard upon him to pay A's losses, so that, in fact, the whole question is one which involves loss to one of three innocent parties,—A, B, and C. The importance of the increased width of the exception is made more clear by showing how the rule was applied to the facts of this particular case. Mr. Hughes desired to rebuild his house, and for that purpose employed a competent architect and a competent builder. The new house was to be one story higher and one lower than the old house. Before the completion of the works, the workmen, in order to erect a staircase, cut into the party-wall of the house of a third person, and injury was thereby caused to the plaintiff's house. The workmen, in thus cutting into the party-wall were acting contrary to orders which had been given to them. Now the operation which, in itself, was likely to cause danger, was taking down the old house and excavating below the adjoining houses: in regard to this proper precautions had been taken, and this part of the work had been safely performed. "Then," said Lord Justice Holker, who differed from the two other members of the Court, "there was nothing else which would

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produce danger to the plaintiff's house"; and he considered that, as the putting up the staircase was not, in itself, an operation at all hazardous to the plaintiff's property unless the workmen exceeded their duty, the exception of Bower *v.* Peate was not applicable. On the other hand, the majority of the Court decided that they must look and see what was the whole undertaking of the defendant; it was, in fact, to pull down the old house and to build up a new one. Some part of the work was admittedly hazardous, and therefore the defendant "would be liable for every act committed or omitted to be done during that period (*i.e.*, of the performance of the whole work), whether by the contractor and his servants or by himself."

As we have said, the determination of the question in any way must be a hardship to one of three innocent parties, and therefore, though we may think the decision hard upon the owner of the new house, it is only a hardship, which, if shifted from his shoulders, some one else would have to bear, for the workman, the actual negligent person, being a man of straw, is not worth suing. To consider the work as a whole will certainly, in many instances, prevent uncertainty as to who is to bear the loss of injuries caused immediately by careless workmen. But that the decision does make the law harder for the building owner no one can very well doubt; indeed, in large houses, what with liabilities for obscuring light and responsibilities for the acts of contractors' men when there is any danger to the property of a neighbour in the operations, the fate of the building owner is not particularly enviable. The neighbour, on the contrary, is in a better position, because he has a substantial person to obtain damages from, and not, as in many cases, a contractor who, on the threat of litigation, will probably threaten to go through the Bankruptcy Court, or, lastly, an impecunious workman. We may fairly suppose, in fact, that all such actions as these against the building owner are commenced when the contractor is unable to pay. The only consolation for the building owner is that he may make an agreement with the contractor that he will repay him all costs and expenses to which he may be put by the negligence of the workmen. No such agreement can, of course, prevent his neighbour from suing him for damages under the authority of these cases, but he may be able to recover over against the contractor, which may or may not turn out to be a valuable right.

THE HOUSE OF LORDS ON COMPENSATION FOR INJURIES TO LAND OR HOUSES.

THERE is probably no subject of what may be termed a legal nature which also is connected with the ownership of property, and more especially of buildings, of larger general interest than that of compensation for property compulsorily taken by the promoters of some industrial or public undertaking. There are few of our readers, we suppose, who have at all made their mark as architects or surveyors, who have not from time to time had to direct their attention to this subject, and many of them, we know, have had a good deal to do with such matters either as arbitrators, witnesses, or managers of the lay part of some compensation case. Taken as a whole, the general principles by which the question of compensation is governed are clear enough and have so little of legal technicality about them that most of those who have paid any attention to this subject have mastered the rules on which it is based. It is certainly not our intention, therefore, to write a treatise on compensation, but as a recent decision of the House of Lords has thrown a good deal of light upon one branch of this subject, and has reduced to order some decisions which were somewhat difficult to reconcile with each other, it may interest our readers if we call their attention to the case of the Caledonian Railway Company *v.* Walker's Trustees (Law Reports, 7, Appeal Cases, p. 259).

Let us, first of all, state the result of some previous decisions, each of which was given by the House of Lords. The first to be noticed is that usually known as Ogilvy's Case, or, more correctly speaking, the Caledonian Railway Company *v.* Ogilvy, which was decided in 1856. In that case Mr. Ogilvy considered that he was entitled to compensation for his property being injuriously affected, because, at a short distance from the entrance to his grounds the railway crossed an important public road on a level. But the communication between the property and the road was not cut off, and access would not be in the least prevented, except from one side, when the gates happened to be temporarily closed, owing to the passing of a train. Various complaints were also made of the inconvenience sure to arise from such matters as the noise of the passing trains. But the House of Lords did not consider that this was the subject of compensation: it was chiefly in the nature of a personal annoyance which Mr. Ogilvy would suffer, together with other passers by, and it was also a mere prospective liability. This decision was practically affirmed by Brand's case, or, rather, of the Hammersmith Railway Company *v.* Brand, in 1869, which decided that the authorised use of locomotives did not give rise to a claim for compensation. Then, in 1874, came Ricket's case, or more properly Ricket *v.* The Metropolitan Railway Company. In this instance Ricket was the owner of a public-house in Crawford-street, London, which was called by the extraordinary name of the "Pickled Egg." On the other side of the same street was the Clerkenwell Workhouse, a large block of buildings, and on the further side of it another street more or less parallel to Crawford-street, called Coppice-row. Between these two streets was a covered way, which ended very nearly opposite the Pickled Egg. Some other street was connected with Coppice-street, and many passengers came down there and debouched from the pathway right opposite the Pickled Egg, which apparently had great attraction for these wayfarers. For twenty months the carriageway in Coppice-row, and another street which led into it, was blocked up, but the footways were at all times open to passengers. However, Ricket complained not only of a temporary but of a permanent loss of custom, as persons had ceased to use this particular route after they had got out of the habit of so doing during the construction of the railway. But the House of Lords held that this was a mere loss of custom, and was not an injury to the house of Mr. Ricket,—injury to the custom of the Pickled Egg being held distinct from injury to the house as a building. Then, in 1874, came McCarthy's case, or the Metropolitan Board of Works *v.* McCarthy, which was briefly to this effect. Property had access to a highway in front and to the river in the rear. The highway by water was taken from the owner by reason of a permanent dock being placed between the building and the river. Here, however, the Lords held that the property was permanently and injuriously affected for whatever purpose it might be used, and, therefore, that compensation should be given on account of this injury. But it will be clear that there was a decided resemblance between Ogilvy's case and McCarthy's case, because in both the access to a property was interfered with. The judgment in the latter case when read *in extenso* makes the likeness between the principles underlying both cases more noticeable. We will now turn to the case which has lately engaged the attention of the lawsuit. Walker's Trustees possessed a property which had a frontage to Canal-street, Glasgow, and had by that street a direct, straight, and practically level access for all sorts of traffic to Eglinton-street, one of the main thoroughfares of the city. The works of the railway company cut off this direct access entirely, and a distant and more circuitous road, crossing the railway with rather a steep gradient, was substituted for it. These were the main facts upon which this case depended for the fact of another direct access having been made somewhat less convenient did not form one of the debateable points. The House of Lords decided that the railway company was bound to give compensation to the owner of the property in question as it was injuriously affected. Although there is a likeness to the previous Caledonian Railway case, there seems in all these cases, and especially this last one, to be one clear *ratio decidendi*. In this last case, and in McCarthy's case, the access by the particular route was absolutely taken away; it was impossible in either case for a person to approach the premises of the old and now obstructed road, to do so was an absolute impossibility. On the other hand, in Ricket's case, and also in Ogilvy's case, there was still the same channel of approach open, although not in so convenient a manner, there was no element of impassability, only one of inconvenience. This, therefore, seems a very material distinction between these classes of cases, and there therefore seems no reason why we should suppose that because a man may now certainly obtain compensation for the direct access to his property being cut off, even though he may reach it by a new and roundabout route, therefore that he can obtain compensation if there exists a temporary obstruction, such as a train passing over a level crossing. On the other hand, it is impossible not to perceive that such a thing as level crossing near a gentleman's front gate may materially diminish the value of his property, and, in fact, that the property is "injuriously affected." The passing of rails over a road is, however, not in itself an obstruction. Therefore, we again come, as it seems to us, to the element which is required to exist in order that a man, whether he be the owner of a house alone or land alone, may obtain compensation if a way to that property is interfered with. He must show that there is an actual obstruction, that the way itself cannot be used, and that it is not simply an inconvenience in the use of that way of which he complains, even though such inconvenience may naturally depreciate the value of his property. If the new way is, however, but very little longer, then this would simply be a reason why the amount of compensation to be awarded should be small.

THE PART PLAYED BY LOMBARD ARTISTS IN ROME.

AMONG the recently-published foreign artistic books referred to in these columns not long since, mention was made of Sig. Bertolotti's interesting study on the Lombard artists, architects, painters, sculptors, and others, who, during the active centuries of Italian art, worked in Rome ("Artisti Lombardi a Roma nei Secoli XV., XVI., XVII."). Sig. Bertolotti's book, the result of patient research in long unrevealed sources of information, is the continuation of a series of studies he has already published on the Belgian and Dutch, the sub-Alpine and the Sicilian artists who have each and collectively colonised, or aided to build up the Papal capital. Rome in this respect for centuries, has served as the gathering point of the artistic world. The Classic interest gathered round the Eternal City stored with its treasures of art, the religious significance attached to the residence of the Papacy, the sumptuous magnificence of the church afforded to the artists, not only of the peninsula, but of every nation, an almost unbounded field for their industry and study. Indeed, at one time it may be fairly said that no other city in the world contained within its walls so many artists. This peculiar *prestige* of the Papal capital has by no means died out, and Rome is still the sighed-for goal of every artistic student.*

Among the numerous artists employed in Rome, few,—especially among the architects,—have taken, during centuries, a more conspicuous place than the Lombards. Lombardy, as every one conversant with the story of architecture in Italy well knows, early possessed active schools, whose pupils we find scattered almost over the whole of Europe; the *magistri comacini* hold a high place in the history of architecture, and it was from the Lombard mountains and valleys that descended over Italy a crowd of artists who have left behind them the traces of their skill. By nature the Lombard,—and to this day he retains the character,—is industrious, active, hardy, and migratory. In Rome, where, during many centuries, the artistic activity was great, the Lombard colony was, at all times, important. Sig. Bertolotti has devoted his attention especially to this colony, and taking each branch of the artists, he lays before his readers the mass of information he has been able to gather relating to various Lombard architects, sculptors, painters, goldsmiths, *stuccatori*, *intagliatori*, *ebanisti*, bronze-casters, embroiderers, &c., employed in Rome from the fifteenth century,—previously to which information is unobtainable,—down to the close of the seventeenth century. Divided into the cen-

* John Hoare, of Bath (the father of Prince Hoare, whose name is so intimately connected with the commencements of the Royal Academy), is generally considered as being the first English artist to visit Rome with a view to study; he, at least, was the first of a long line of English artists who have now for 150 years regularly colonised the Papal city.

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turies, and then again into the various branches above mentioned, the work becomes to the antiquary, and as a work of reference, of much interest. To the general reader, however, Sig. Bertolotti's two volumes will scarcely be found to afford much that is entertaining. The author has gathered his materials, he tells us, largely from the religious legal and criminal registers, or, as we should now say, the police reports of the capital, and the lengthy minutes of examination, trials, assessments, quotations of wills, and so forth, somewhat tend to rob the work of the interest it would possess had it been arranged with more regard to literary exigencies. The author only claims to bring forward hitherto unpublished information with a view not only to drag from oblivion the names of a number of unknown artists, but to aid in the correction of the existing biographies of the more famous artists. In this direction, Signor Bertolotti has eminently fulfilled his task and merits the gratitude of all lovers of truth.

It is an old story that artists in the past were far less sensitive as regards their work and position than they now are, and for some generations have been. One feature that is noticeable in all the early periods is the frequent mention as artisans and workmen, of individuals whom we should now term artists. Architects we find named in the accounts as simple masons, *muratori*; painters did not disdain to adorn with their brush the banners and the *cassoni* or marriage coffers of their employers; and sculptors we find designated as carvers, and so on. This feature, noticeable in English and French artistic history, we also meet with in Early Italian art.

It is practically with the fifteenth century, that fecund period of archæological study, during the pontificate of the learned and cultivated Nicholas V. that commences the regular migration of Lombard artists to Rome. Martin V. and Eugene IV. had prepared the way for the architectural activity of the succeeding reigns which a period of peace further aided. The Romans, it will be noticed, have never distinguished themselves in the walks of art. When, therefore, the capital, in the artistic zeal of the Renaissance popes, was re-built and decorated, it is Florentine and Lombard artists who will be met with as the directors and workmen. The Tuscans, as nearest Rome, are the first in the field, but we soon find the Lombard element prevailing. Trained in the sturdy traditions of their ancestors, who, at the birth of art in Italy, had learnt the secrets of working in stone and marble, it was but natural that it was to them that the inhabitants of the plain turned when in want of artists and artisans. The secrets of their art, transmitted from generation to generation, the Lombard *comaschi*, bore to Rome, and out of the ranks of the humble *muratori* and *scalpellini* many an artist sprang, modestly content, however, still to be termed nothing but a master-mason or stone-carver. In the fifteenth century we often meet in the accounts rendered with references to master-masons, master-*carpentarii* or carpenters, often none other than distinguished architects and sculptors. During the busy fifteenth and sixteenth centuries it is especially as architects that we find the Lombards employed, and Sig. Bertolotti gives us a lengthy list of names he has met with in his researches in connexion with the building and restoration of St. Peter's, the Vatican, the Campidoglio, the castle of Sant' Angelo, and a host of other important works in the papal capital, bridges, fountains, roads, &c. We even find the architects employed during siege time as *bombardieri* and the sculptors' talents turned to the production of stone balls.*

Throughout this and the following century the custom is invariable,—and the accounts reproduced by Sig. Bertolotti curiously prove the fact,—for the architects to employ the materials of the Classic buildings for their modern works. Antique stone and marble were, as is well known, used by the sculptors and *intagliatori*, who found that to drag their material across the mountains was needless, when easily-worked quarries existed so near. In one year alone Nicholas V.,—perhaps one of the most devoted lovers of antiquity and learning of the whole Renaissance period,—dragged from the Colosseum, we learn, 2,500 cartloads of travertine and tufa; and Sig. Bertolotti further gives us a number of lengthy extracts from the papal registers. Thus we meet with constant reference to *chava a Chuliseo*; *chava a Templum pacis*, &c. In spite of the prohibition of Pius II.,—the worthy and learned friend of the artists, Piccolomini,—the apostolic chamber continued, we see, their pillage. The Colosseum, the Thermes of Caracalla, Diocletian, and Constantine, were the chief field; and, in the time of Alexander Borgia, the excavation and demolition of the antique buildings were regularly farmed out. In this busy fifteenth century the Lombard artists at Rome not only distinguished themselves as architects and sculptors, but as goldsmiths, armourers,—Brescia was famous for its arms,—its *morsari* or *loriners*, as we should term them, and its embroiderers.

The pontificate of Sixtus V. forms an epoch in the architectural history of Rome, and busy times, indeed, were they for the artists in the employ of the Pope and his court. Great as were the overwhelming figures of the sixteenth century, the Lombard artistic colony again stands out conspicuously, headed by Domenico Fontana, whose fame and fortune only further increased the already large body of Lombard artists resident in the city. The Fontana family, remarks Sig. Bertolotti, would in themselves furnish ample material for a book; but their fame being so well established, our author, in accordance with his plan, proceeds only to give us some so far unpublished incidents and facts. Among the accounts are given that for the transport of the famous *guglia*, or obelisk of St. Peter's; that for the moving of the equally famous horses on Monte Cavallo, and the restoration of the column of Antonine; the total of the expenditure made by the architect for Sixtus V. being set down as over a million scudi.

Of Carlo Maderno,—we pick out of the interminable list of unknown names given by the author, those most familiar,—Signor Bertolotti finds little new to tell us: "*troppo fece in Roma*," he piquantly remarks: "*e quasi nulla è ignoto*"; "he produced too much in Rome, and almost nothing of his is unknown." Giacomo della Porta, Signor Bertolotti considers as of Lombard origin. The long chapter filled with its somewhat dry details devoted to the Lombard architects of the sixteenth century serves, certainly, to show how largely Rome is indebted for its architectural glories to the Lombards, in spite of the overshadowing names that have left their mark on the wonderful century, Peruzzi, San Michele, Giulio Romano, Sansovino, Palladio, Michelangelo, Vignola, Vasari, Ammanati, and so many others.

Of the Lombard painters, some interesting notices are supplied, but the names he gives are known but to the diligent student of Italian art. The sculptors present a stronger contingent. They appear to have formed part of the Roman Academy of St. Luke, though it is doubtless to that sad misunderstanding that so often exists between the different branches of the arts that we find before long a separate guild of sculptors.*

Among the goldsmiths,—the Lombards had long earned a high reputation for their skill in this art,—Benvenuto Cellini, introduced as a great star round whom are grouped a whole host of Lombard workers, serves the author to give some most interesting particulars respecting the artist; among these, the very lengthy but invaluable inventory of his *bottega* or shop. The Via del Pellegrino,—near the superb and familiar palace of the Cancelleria,—was the headquarters of the goldsmiths just as at the same time with us Goldsmiths'-row, Cheapside, or in Paris the Quai des Orfèvres, near the Pont Neuf, or in Florence the Ponte Vecchio. Even to this moment there still hang on in the Via del Pellegrino a few goldsmiths who keep alive the traditions of the old days. Sig. Bertolotti has much to tell us of Caradosso, a Lombard goldsmith spoken of not only by Cellini but also by Vasari, and a great favourite of those three typical popes, Julius II., Leo X., and Clement VII.; while mention is also made of a band of Lombard goldsmiths who worked in Spain in the sixteenth century. The chapter is closed by a curious account of the famous and symbolic *rosa aurea*, or golden rose, the sacred gift which the popes solemnly blessed on the fourth Sunday in Lent, and then sent to the sovereigns who were their allies. From originally a simple piece of goldsmith's work the symbol, it appears, grew with centuries into a costly work of art. Clement VII., it may be remembered, sent in 1524 one of these golden roses to Henry VIII.*

Many details are given by Signor Bertolotti of the Lombard *intarsiatori* and *ebanisti*,—Lombardy, it appears, was early famous for its workers in inlaid wood,—*spadari*, sword-makers, cutlers, and armourers, in speaking of whom the author quotes a lengthy account of the manufacture by a Cremonese of a regular *mitrailleuse*, ordered by Pius V. to fight against the Turks; further details are given of the Lombard typographers, booksellers, and binders. Of the Lombard embroiderers and weavers, Signor Bertolotti has much to tell us; the many churches and their wealth gave full employment to a large number of hands, notwithstanding that much of the work was of Spanish, French, and Flemish origin. The weaving and working of silk, it must be remembered, was introduced into Lombardy early in the fourteenth century; Sixtus V. having introduced it into Rome only in the sixteenth century with the weaving of wool.

In the seventeenth century we meet among the Lombard artists with Giovanna Fontana, and again with the Maderno family in connexion with numerous engineering works, while a long and curious notice is given to Longhi, members of a family famous as architects,—who occupied, it appears, in 1611 the house of Michelangelo. Many documents are given relating to the unfortunate Francesco Borromini who, it will be remembered, ended his life by his own hand. In this active seventeenth century the number of churches and palaces, the work of Lombard architects, is wonderful; though architecture is in full decadence, it is impossible to deny the talent of the artists. The Fontana, Maderno, Borromini, Longhi, and Ponzio were architects who hold a high place in history; had they but lived a century earlier they would have been really great; they serve alone, however, to show the decadence, by the exaggeration of the beautiful.

Among the Lombard painters Michelangelo da Caravaggio holds the first place in the seventeenth century, and a lengthy account is given of him, chiefly made up of very disconnected quotations from lawsuits and other legal documents, and mention is made among other artists, such as Francesco Mola, Serondine, Parone, Stella, and Sacchi, of the sculptor Ercole Ferrata, whose very lengthy will is here printed *in extenso*. As in the previous century the goldsmiths continue the reputation of their predecessors, though scarcely in the same direction; the Via del Pellegrino is still crowded with Lombards, and a long list of names is given by Sig. Bertolotti, as also of the armourers, embroiderers, and other artists who still kept alive the Lombard fame as skilled artisans.

In these three centuries in which we have seen them, the Lombard colony had grown wealthy, and possessed several corporations, numerous churches, and more than one hospital. As builders, masons, and architects' assistants, they had almost enjoyed a monopoly, and from their number more than one artist had worthily taken his place by the side of the great names which make the fifteenth and sixteenth centuries the golden age of Italian art; as artisans the Lombards had held high the reputation they for centuries had enjoyed.

Signor Bertolotti, with the patience of a Benedictine, has gathered a mass of information which cannot fail, in years to come, to constitute to the curious student a most interesting source of reference. The two volumes are supplied with what renders almost any book valuable,—an exemplary index. How many interesting names and facts could be rescued from oblivion, if some English author as industrious as Signor Bertolotti would bring to light from the archives of the great cathedrals and other buildings, some notice of the clerks of the works, master masons, and other assistants to the great architects,—those non-commissioned officers, the back-bone of the army of art, who have erected the glorious creations that exist in our country.

Desks and School Furniture.—The desks and other school furniture required at the Harpur Trust Schools for Girls, Bedford, and the Princess Helena College, Ealing, were supplied by Messrs. G. M. Hammer & Co., Strand.

* The peaceful architectural use that has been made of these military stone balls is well known to the profession, and it would not be difficult to trace their first application to decorative purposes down to the present day, when we see their imitations adorning the gateways of our modern "Queen Anne" houses. The villas of Italy and the châteaux of France will be frequently found adorned with these rude implements of war.

* Down to recent days the sculptor, John Gibson, almost boasted that he knew "nothing about painting."

* The last golden rose was, if we are not mistaken, recently sent to a great personage in America.

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CONTINENTAL GATHERINGS.

THOSE who visit Paris this autumn, and who may remember the gay French capital before the sad days of the war, will see again on its old site the Hôtel de Ville; if not the same characteristic Renaissance pile which, for 300 years, had been the witness of so many scenes, joyous and painful, in French history, a building professedly in the same style as the Italian Boccador's design, though larger and unmistakably modern. The exterior of the building is, as we have more than once announced in these pages, now completed, and a few days before the great July fête when the new building was inaugurated, the last scaffold-pole, with a tricolor flag attached to it, was removed amidst the cheers of the whole body of workmen. Once again the Parisians have their town-hall, and the destruction of their Hôtel de Ville is merely looked upon as "an interruption in its existence." The admirably representative nature of the banquet held on the occasion of the inauguration of the building shows how thoroughly the French municipality understands that their prosperity is closely knit up with the various sections of the community; in addition to the guests usual on such occasions, the prefect invited a member of each of the numerous trades which had assisted in the re-building of the Hôtel de Ville, a delegate from the trades-committees, a medical student from the hospitals, a member of the police force, a fireman, an *Invalide*, or, as we should say, a Chelsea pensioner, and a workhouse inmate. Somewhat different this from a London city banquet. As we have more than once reminded our readers, the Paris Hôtel de Ville is not yet completed, nor will it be for two years to come. The whole interior remains yet to be finished.

Although it has more than once been announced that the ruins of the Tuileries were to be removed, the final sanction of the French Chambers has only just been given. It is now decided that so sad a remembrance of the days of the Commune shall no longer remain in the heart of Paris. There is small ground for archæological regret at this step. Very little remained of the palace which Pierre Lescot built for Catherine de Medici, while in historic memories, familiar as is the name of the Tuileries, in its three centuries of existence, it perhaps owes its chief interest to its connexion with the latter days of Louis XVI., and even more to the late Emperor Napoleon. At other times it has been singularly deserted by royalty. The little-known early connexion of the spot, when the tileries were still worked which gave the palace its name, with the patient efforts of the Protestant potter, Palissy, add, perhaps, as great an interest to the site as any that history has succeeded in weaving round the name of the palace that will soon be but a memory of the past.

A memory somewhat more distant in the story of the French capital has of late been revived. In digging the foundations of the new Post-office the men came upon a mass of remains of animals belonging to what geologically is known as the Quarternary period. M. Guadet, the architect, at once handed over these relics to the Natural History Museum, and they are found to have belonged to the horse (*Equus caballus*), the deer (*Cervus elephas*), and the mammoth (*Elephas primigenius*). Though of the utmost interest, the find is no novelty in Paris. Cuvier, the French Owen, discovered in Paris his famous mammoth; and elsewhere in the capital remains have from time to time been brought to light of the prehistoric times when marshes and forests covered the site of modern Paris. At the present moment it is curious to light upon the relics of so primitive a period.

Some time since reference was made in these pages to the Church of the Sacré Cœur being erected at Montmartre. The French Chamber have, it appears, prohibited the continuance of the works, which have now reached a very forward state. The matter, unfortunately is complicated with religious and political questions in a manner such as can be little understood in this country. The pecuniary situation of the so-called "Vœu National" is satisfactory in spite of the enormous expenses that have had to be met. Hard on ten millions of francs (400,000*l.*) have been so far devoted to the foundations alone. When the church was first projected the nature of the ground was unknown, and it was proposed that the building should rest on a huge bed of concrete; no sooner, however, had the work commenced, than the soil, composed of sand, clay, and shells, was found to be entirely unsuited to support the weight of the proposed building. It was not till a depth of considerably over 150 ft. had been bored that solid rock was struck. Eighty-eight large pillars, some 10 ft. to 15 ft. square, were then built to serve as the foundation, the whole representing over 30,000 cubic yards of masonry. Hard upon three years were occupied in this work,—terminated in 1878; since then these pillars have been united by triple arches, and on this solid foundation the work progressed, the walls now having risen about 40 ft.; the total height, according to the original plan, was to have been about 230 ft. Now that the Government has prohibited the continuance of the works, it is not easy to see how the matter will be terminated; but the great difficulty as regards the foundations having been overcome, the building, of course, may be turned to any use that may be thought fitter than that on which the clerical party had determined. It has been illustrated in these pages.

On the meeting at Geneva of the Fourth International Congress of Hygiene, an exhibition, we hear, will be held in September next. All the various inventions and appliances relating to the important question of hygiene will be represented, and we may expect that a further advance may be made in the progress of a science, to the teachings of which in all its bearings too much attention cannot be paid.

Not long since, at Rouen, an interesting lecture was delivered by Dr. Napias on the "Hygiene of the Workshop." After reviewing in turn the very different and often dangerous surroundings in which the workman has so constantly to exist, the lecturer very properly drew attention to the fact that he has it in his power, apart from the protection that the laws and sanitary science give him, largely to reduce the dangers to which he is subject. Two most important features in the question the lecturer considered to be,—first, the supply of adequate industrial dwellings to supersede the too often unhealthy houses of the workman; and, secondly,—a point which can alone be hoped to be corrected by the spread of education,—the vice of excessive drinking, subtilely robbing the workman not only of his power of saving, but of the very skill of hand on which his living and happiness depend.

An archæological discovery of more than usual interest has been recently made in Poitou, near Sanxay, of a Gallo-Roman balneary station. The ruins, covering an area of over twelve acres, consist of the remains of a temple, a theatre, a number of baths, and accompanying hostelries; in fact, a classic watering-place, with the usual concomitants of pump-room, assembly-rooms, and hotels, as we should now say. The first discovery made was of an aqueduct, traced for over a mile to the ruins. Our informant, the *Journal des Débats*, states the temple to be one of the largest known,—meaning, we presume, in France. Adjoining the temple are the bath-houses, extending considerably over a length of 100 yards, and comprising the usual accommodation, hot-air rooms, covered walks, gardens, and porticos. On the further bank of the river Vanne the remains of the theatre have been brought to light, backed up, as is customary, by the hill. A large number of Roman and Gaulish coins have been found. It is presumed that the buildings belong to the period of the Antonines,—second century before the Christian era,—and that the station was destroyed during the invasion of the Visigoths in the fifth century. Conducted under the Curator of the Museum of the Société des Antiquaries de l'Ouest, M. de la Croix, we may expect that the excavations will yield much interesting information.

From a somewhat more distant Roman colony, the Dobroudjka, a recent archæological commission, despatched by the Austrian Government, has been able to enrich the Bukarest Museum with a large number of most interesting relics. The delta formed by the Danube in the north-east of Bulgaria, though fertile in some parts, has never been thoroughly explored, in spite of the classic interest attached to the spot. To Tomos, the Kussendjé of to-day, it was that Ovid was exiled, it will be remembered, and here he wrote his "Tristia," and those abject "Epistles from Pontus," that show how severely the cultured poet suffered during his absence from Rome. The district,—a very unhealthy one,—is covered, it appears, with Roman remains, which the Austrian commission to which we have referred has thoroughly explored.

Though archæology has never found any opponents in the ranks of refinement, there are those who not unjustly deplore its sometimes exclusive influence. In the study of architecture, while a wide acquaintance with the work of the past is absolutely essential, too lengthy a devotion to its study, it is claimed by some, is injurious to the development of that cultivated originality which is the spirit of all art. Deploring not so much the prominence of the more technical archæological studies in this year's architectural exhibition at the *Salon*, as the marked eccentricity of so many of the "original" designs, our contemporary *L'Art* has recently been expressing its views on the subject. "We certainly seem to understand the utilisation of the past in a somewhat curious manner. Almost better, perhaps, completely to forget it if such are the results obtained from its study; one would be tempted almost to exclaim, with a professor of the École des Beaux Arts, in a lecture recently delivered by him, 'our enemy is archæology.' So far, however, from this being the case, the evil lies in our ignorance of what our predecessors have done, and this deficiency is daily becoming more evident in the clumsy and unconscious use made of the forms of the past. Thus, in France, Greek is now fixed on as the style suited for law courts and such buildings, Roman for municipal buildings, Renaissance for our theatres, *hôtels-de-ville* and private houses, Gothic for our churches, and all without respect for principles, without the slightest regard to climate or the nature of the materials employed. It would seem to be time that the State, which has already shown a warm interest in the encouragement of the industrial arts, should recognise that their inferiority is in great part due to the insufficiency of the education given in architecture, the influence of which for good and for bad has at all times been, and is, very considerable on all the productions of contemporary art. The supporters of the existing system are warm in its defence, and point to the numerous pupils, French and foreign, who crowd the benches of the École, but the result obtained is the most important question. Do our modern houses and edifices generally supply our requirements? and are they not from almost every point of view,—excepting in rare cases,—inferior to those of the past? and do we profit as we should do by our study of the works of our predecessors? Scarcely. Perhaps it would be better to admit this than allow ourselves to be blinded by the facts." We are afraid that the strictures of the writer are only too well founded.

The publication known as the *Deutsches Kunstler Jahrbuch* for the current year affords some interesting information respecting art matters in Germany. Such works, like our own "Year-book of Art" and the corresponding French "L'Année Artistique," are growing, as time passes on, most invaluable means of comparison and sources of reference. The German "Year-book" is indeed what its title indicates, a statistical handbook for art-matters generally. A review is given of the whole archæological work of the year, the discoveries and purchases made, the buildings restored,—Ulm, Aix-la-Chapelle, and Strasburg cathedrals, most important items,—the list of the various academies, schools, societies, not alone of Germany, but of Austria and Switzerland. An interesting account is given of the Imperial German Archæological Institute founded in Rome now over fifty years ago, and which has, as our readers well know, afforded through its admirable publications so many interesting acquisitions to our knowledge of classic art and existence. The Institute, in addition to its reports published in Italian and German, has no fewer than five annual bursaries, each of the value of 150*l.* The "Year-book" further gives a complete and detailed list of the public collections of Germany, not alone those of Dresden, Munich, and the capital, but of the smallest towns. We learn that there exist nine superior technical art-schools at Aix-la-Chapelle, Berlin, Brunswick, Darmstadt, Dresden, Hanover, Carlsruhe, Munich, and Stuttgart, schools in which the pupils are instructed in the most complete manner as architects, engineers, chemists, &c. To the Academy of Fine Arts at Berlin a lengthy description is devoted; the educational establishment is composed of the *ateliers* (as in France), the Academy properly so-called, and the schools.

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There are, it appears, five *ateliers*, for historical painting, *genre*, landscape, engraving, and sculpture; the Academy accommodates nearly 250 pupils; the schools, of course, resemble greatly those of our own Academy. After Berlin comes the Academy of Dresden, which accommodates about 130 pupils; then Düsseldorf, with about 150 pupils; Munich accommodates hard on 400 pupils, standing high among the art-educational cities of the world. A feature to be observed in Germany is the important position assigned in the universities to art education. In the twenty-one universities spoken of in Herr Springer's work, twenty-three courses alone are devoted to classic archæology, not including Egyptian archæology, and twenty-one other courses are devoted to the history of art and æsthetics. The year-book displays a goodly list of art societies, many consisting of several hundred members; that at Cassel numbers over 900 members. The societies for the encouragement of art are especially noticeable; Herr Springer mentions eighty alone, and all spending liberally annual sums in the purchase of works of art; thirteen societies are connected with the decorative arts, and as a last detail, twenty-two societies represent the interests of the architects and engineers. Perhaps the chief feature to be gathered from such a work as this is the evidence of the absence in Germany of that centralising and clique-ish influence which is so noticeable in our country. We see several cities, such as Munich and Dresden, possessing art institutions superior even to those of the capital, while throughout the country in innumerable little towns, there exist active and influential societies which, in the true spirit of friendly co-operation and good-fellowship, foster and keep alive in every corner of the Empire an interest in the refining pursuits of art and archæology.

THE OAK IN HISTORY, ART, AND HANDICRAFT.*

IN continuation of our subject, and before entering into some necessary technical details of a practically useful character in respect to the qualities of the oak as a timber, and the value of the tree in the supply of a number of commercial wants, we will glance back at a few more matters of historical interest. Our British ancestors, builders, ship-builders, and implement makers, appear to have had a good knowledge of the value and properties of the oak and other building timber, whether intended for uses under ground and water or above both. If our builders and early carpenters lacked a knowledge of physics and chemistry, or, in other words, scientific information, their constructive ingenuity in framing timber, as well as in cutting and building with stone, proves that they were not deficient in a fair knowledge of geometry, the wear and tear of materials, and its behaviour under various conditions, including pressure, strain, and the effect of the atmosphere and time. In some instances, perhaps several, they erred in their practice on the right side by using a plenitude of material. In principal, king-post, tie-beam, hammer-beam, truss, particularly in roofs where a great span was involved, what is known as camber, sag, twist, and leverage, under varying conditions, were attended to. The oak scantling was not spared either in depth or thickness, and solid material was put in without making up by patching or stuck-on pieces, save in the special instance of ornamentation. Native oak timber was in abundance in the so-called Middle Ages, and at a much later date. When the necessities of ship-building, with other home needs, began in the thinning of our English woods and forests in the seventeenth century, we find that Ireland in some of her districts was looked to for a probable supply of oak in addition to that obtained from foreign sources. During the civil wars in Ireland between William III. and James II., we find in a scarce work, written by George Story, a chaplain who accompanied one of William's regiments, that two commissioners whose names are mentioned, were appointed by the king to proceed to Ireland and inspect certain oak woods in the neighbouring counties to Dublin, with a view to the utilisation of the timber for ship-building. It appears also that Ireland, from an early date, contributed oak to England and some Continental countries for building uses. More than one authority mention that Irish oak was supplied for Westminster Hall, the Old Shire Hall, Chester, some colleges and halls at Oxford, and the Stadthouse at Amsterdam. Whether it be Irish or English oak that was framed into the roof of Westminster Hall or not, there can be little doubt of it being British carpentry, and a magnificent specimen of true geometrical handicraft, perhaps the best existing specimen in the British Islands. This Westminster hammerbeam roof is a technical study for all conscientious carpenters and builders, standing securely in its beauty after four centuries and upwards of duration. This roof illustrates the property of the triangle, showing that while the lengths of the sides remain the same the angles are unchangeable. All the pieces of timber here are arranged to form the sides of triangles, and consequently all the joints are fixed and immovable. There are several other fine open-timbered oak roofs in this country open to the thorough inspection of all critics, for the builders or workmen who erected them would be ashamed to conceal their handiwork, and scorned to hide it with plastered ceilings.

In the ancient Celtic Brehon Code there is a number of important regulations in regard to useful timber trees, the oak being the first mentioned. These Brehon laws, it may be mentioned, remained, until quite recently, little known, though occasionally referred to, through the difficult archaic character in which they were written. By the assistance of the Government they are now nearly as a whole before the public, and their value in various ways is acknowledged and undeniable. By the Brehon Code, trespass, as well as serious crimes, was not met by capital punishment, but by a system of erics or forfeitures in cattle. Reliable evidence is afforded by these laws concerning the several kinds of trees cultivated or known by the early Celtic race. The timber trespasses included the cutting down of timber trees, designated *arigh* timber, *athar* timber, *fogla* timber, and *losa* timber. The first-named division included oak, hazel, holly, yew, Indian pine, and apple. Five cows were the penalty exacted,—yearling cow-calves,—for cutting the limbs, and heifers for cutting the branches. The second division included alder, willow, hawthorn, quickbeam, birch, elm (probably wych elm). A cow was forfeited for each tree and a heifer for the branches. The third division included blackthorn (*i. e.* sloe) elder, spindle-tree, white hazel, and aspen. The trespass in respect to these trees was a forfeit of a heifer for each. The fourth division, or *losa* timber, went under the denomination of firewood, including such plants and shrubs as fern, furze, briar, heath, ivy, reeds, and thornbush, a fine being exacted for each. We see by these regulations that the Brehons promulgated laws to protect ornamental as well as useful trees. No doubt some of the important personages who had an influence in forming these timber laws, like our modern landocracy, knew well how to protect the rights of their own properties from the trespass of the more common folk. The Israelites, as may be seen in Deuteronomy, are ordered not to employ fruit trees in sieges, "only trees which thou knowest that they be not trees for meat thou shalt destroy, and cut them down; and thou shalt build bulwarks against the city that maketh war with thee, until it be subdued." There is certainly no small amount of evidence that points to the Eastern or Aryan origin of the Celtic race and language, and to worship and customs, bespeaking the same origin once obtaining among the early Celts. The Greeks never separated the hamadryad from her cœval oak, and our British historians never dis-associated our mysterious Druids from their favourite groves of oak.

If it was necessary, hundreds of instances of a historic character could be cited in respect to the esteem in which the oak has been held in Britain since the Roman occupation down to a recent date, and of the various uses to which the native-grown wood has been applied in the industrial arts. From the first building of London Bridge on through several centuries, the old City Fathers were careful to keep in stock a good supply of native oak for the works of the City in building and repairs. One instance may be quoted here of more than ordinary note. In an inventory of the stores at the old Bridge House, London Bridge, in the 24th Edward III., 1350, we have an enumeration of several building materials, and among the rest,—"400 great pieces of oak timber, value 40d. by the piece, making 100 marks. Also, a pile of timber, lying in the garden close adjoining to the water of the Thames, valued at 20 marks. Also, timber for 14 shops, fully wrought and framed for immediate building, 36*l*. Also, divers pieces of timber lying in various places in the said court, valued at 19*l*. 6s. 8d. Also, 120 pieces of elm, for piles, at 2s. the piece, 12*l*." It is also worthy of note at this early date that Portland stone was in use in London, and a large quantity of it was in the above-mentioned stores, "hand-worked and squared." It would appear, however, at this early date there were also exports of deal or Baltic timber, if the word *estrichesborde* signifies timber, from the Eastern countries. Since man first endeavoured to convey his thoughts or to register them in some symbolic or written character, the use of tablets of wood and the prepared inner bark of trees have been used as a writing material, and the oak, wood and bark, have both been pressed into service, as at a later date in the wood blocks for printing and pictorial illustrations. It is a singular fact that the most ancient form of Gaelic or Irish character, the names of the letters have in each case the names of trees. The Ogham alphabet is called *beithluisnion*, from the name of the first two letters, *beith* signifying a birch-tree, and *luis* the mountain-ash. It is conjectured by some that the names of the letters were given to the trees, and not the names of the trees to the letters. It is remarkable that the names of the trees and the letters coincide, and that all the trees in this old alphabet are indigenous to Ireland. The name of the oak in Irish is *duir* or *doire*, and the county of Derry (*i.e.*, the modern Londonderry) is derived from the Irish word signifying "the place of oaks," the country having been anciently thickly wooded with oak-trees. (See "Ordnance Memoir and Survey.") Several towns and villages in Ireland commence with the word "derry," such as Derrybawn, &c., the said places being associated with ancient oak woods.

Without attempting to enter into any botanical descriptions of a minute character, we may observe here that the *Quercus robur* is the common British oak, and is spread more or less over the British Islands; but there are two varieties of the oak which some botanists are inclined to regard as distinct species, viz., the *Quercus pedunculata* and the *Quercus sessiliflora*, or the sessile-fruited oak. The latter is very common to Durham and the North of England, as well as the temperate parts of Europe. The wood of the *sessiliflora* is of a darker colour than the *robur* or common oak. Under the plane and finishing processes of the workman the wood presents a smooth and glossy grain not unlike the chestnut. The larger septa or silver grain of the *Q. sessiliflora* is not so abundant as that in the common oak. As a wood, however, it is heavier and harder, but it is subject to warp and split if not protected in the seasoning. The common British oak grows to a very large size under favourable conditions, both in the woods and hedgerows. The wood has generally a reddish hue, the larger septa numerous, producing large flowers. The grain, as a whole, is fairly straight, and, to a large extent, free from injurious knots. Unlike the *sessiliflora*, the *robur* splits freely, making good laths for plasterers and slaters, and has been often used for such when the timber was plentiful. Where the timber can be had readily it is, without doubt, the best kind of oak for joists, rafters, and for other house-building purposes, where stiffness and straightness in grain are desirable. It is a moot question which of these two kinds of native oak constitutes the splendid material found in several of our old Gothic and open-timbered roofs. Some authorities think, as far as observation after a great lapse of time can show, that it is the *sessiliflora* that forms, in most instances, the Mediæval roofs of our cathedrals and churches, but there can be but little doubt that both species were pressed into service, and that the material used depended much on local circumstances, and in whatever was available or good of its kind. In the conversion of valuable timber into plank, scantling, or boards intended for ornamental and furniture uses, and where it is required that the broad exposed surface, untouched by paint or with the aid of varnish, should exhibit the full beauty of the grain, it is necessary to act with a little foresight or experience. A tree or a balk for ornamental purposes and effect, particularly the

* See vol. xlii., p. 765.

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oak, may be cut to great advantage or the reverse. To cut a large balk of oak to advantage for ornamental uses, it is necessary to cut it so as to pass obliquely through the larger septa or silver grain, thereby producing the feathering or fine flowered appearance so well known in the oak and also in other valuable and fancy woods. Attempts are often made by grainers to rival the natural grain, but success is rare by paints or stains, and the same may be said of paper-stainers, even when the natural wood is utilised as the pattern or model. In structure the oak has defined characteristics like the ash, elm, and chestnut, and these, through experience, are known to the workmen, who are in the habit of operating upon them with edged tools. The sections of a number of building timber trees show that the wood is composed of separate layers, circles or rings, surrounding the pith. These layers or rings are not, as a rule, regular in their thickness. With a good pair of eyes, or with the aid of a magnifier, a number of rays constituting fine divisions will be at once discovered, spreading from the pith or core to the bark, with pores between, in some cases empty and in other instances filled with a vegetable substance. The British oak and other foreign varieties exhibit very distinct annual rings, one side being porous and the other compact. The *Q. robur*, or common oak, is easier to work than the *Q. sessiliflora*, but in strength, elasticity, toughness, and hardness all combined, it is generally conceded that the *sessiliflora* is superior for ship-building, though heavier and more difficult to work than the common oak. It would lead us too far afield in the present article to enter into a statement as regards the relative durability of different woods used for building purposes, and the theory of strains as it affects oak and other bearing building timber as compared with iron or other materials. As regards crushing strength, tensile strength, working strain, and working load, and other tests applied, British oak shows good results when the wood is well selected. As regards crushing strength, it may be taken as an axiom that wet timber is not nearly so strong as dry, and that the square is the strongest form of rectangular pillar. It may also be accepted, as far as experiments have gone up to the present, that the limit of elasticity of timber is not accurately defined, the co-efficient of elasticity depending on the dryness of the timber. Though oak or other timber railway bridges have shown short lives in America, it must be remembered they were hurriedly erected, and nearly always of green or unseasoned timber. In the British Islands, however, we have several instances of very long-lived oak timber bridges, of bridges which, by ordinary care or repairs, have stood a remarkably long time,—indeed, for centuries. Some of our best authorities conclude that the working load on piles depends more on the nature of the ground than upon the actual strength of the timber. As piles in foundations under masonry are buried deep in the ground, the latter, of course, supports an uncertain share of the weight of the superstructure, hence it is difficult to determine the exact distribution of the weight resting on piles and on the surrounding soil. Elm for piles under the water or for support in unstable foundations on land, has a good historic character to its credit for durability, but the majority of our old architects were in favour of oak, and used it plentifully for palings and framings in foundations for stone as well as timber bridges over rivers. In the treatises of Alberti, Palladio, Scammozzi, Serlio, and in other authors, in addition to those already mentioned in the course of our subject, interesting information will be found respecting the use of oak timber. We said that elm for piling purposes under the water or for wet situations, bears a good historical character, and we may add that the fact was instanced in the case of the piles of old London Bridge, many of which were elm, and after a lapse of 600 years the timber showed no material decay. When the qualities of toughness and elasticity are also considered, and when sudden and repeated shocks are to be sustained, undoubtedly the ash is superior to all other British timber, consequently it is useful in carriage and cartwork, machines, implements of husbandry, &c., but for building purposes it is not suitable, for it is too flexible and not durable enough. For general purposes, the British oak stands pre-eminent as a useful and ornamental timber.

As there are some other varieties of oak timber, some found in the British Islands and others imported, and more or less used in connexion with building, a little information about the relative qualities of the principal kinds will not be out of place. The common British oak, when young, is very tough, and the wood often cross-grained, and rather difficult to work. The dry or well-seasoned wood is hard, and it requires the cutting-tools of the workman to be kept in good order to produce a satisfactory finish. The young wood does not joint well with glue, while seasoned woods of most kinds generally do, save those that contain an oily matter, like some strong-smelling, aromatic, or odorous woods,—for instance, rosewood. These last-named kinds require a good drying-out process, or an exposure before the fire before glueing their joints. The Durmast oak, which is to be found in the south of England, which is often used in building, is a native of France, but it is much less strong than the common British oak. There is a fox-coloured or brown oak, mostly to be found in Lincolnshire, which, though not as endurable as the common oak, yet it is a useful timber for sundry purposes in carpentering and building. Among the chief foreign varieties of useful oak timber trees are the Riga oak, the Dantzig, red American oak, white American oak, Adriatic oak, &c. The Austrian oak attains a much greater altitude than the British tree, but the wood is whiter, more soft, and less valuable. Among the American kinds, the chestnut-leaved oak is remarkable for its beauty of form and height. The wood is however, cross-grained, but very serviceable in special cases; for instance, the wheels of carriages, &c. The *Quercus obtusiloba*, or blunt-lobed iron oak, is valuable as a ship-timber. The *Quercus alba* is a great favourite in America. It is a white oak attaining an immense size in some of the States, and is suitable for both house and ship building, the wood being tough and flexible, and has good lasting qualities. In a word, it may be said that oak of the best quality is more lasting or durable than any other timber tree attaining a like size. There are several European, American, African, and East Indian oaks of the evergreen kind, some of them useful as timber, but mostly known perhaps through their properties, resources, or extracts as articles in commerce, dyeing, medicinal, or other economical uses. The *Quercus suber* is an important tree being the cork oak of commerce. The bark of the younger trees is imported for tanning purposes, but the bark of our native oak has from time immemorial been used for similar purposes, as also the saw or wood dust of the tree. From the Kermes oak, or *Quercus coccifera*, was obtained the original famous crimson dye, or, rather, from the insect associated with this oak. Similarly to other insects in the British tree, in this oak lives the *Coccus ilicis*, or small scale-shaped insect, which, when immersed in vinegar and dried, produces the colouring matter from which scarlet dyes were usually obtained before the discovery of the Cochineal insect of Mexico, the *Coccus cacti*. It is curious to find the early use of scarlet in the offerings of the Tabernacle. Again, we have Plutarch quoting from Simonides a description of sail given by Ægeus dyed with the flower of the *prinos* or evergreen oak. Further, we have mention of the *coccus* in Theophrastus and Pliny. The oak, native and foreign, as a living tree, or as a building and ornamental wood, despite its hardness, is not, more than other hard or softer woods, free from the attacks of wood-boring beetles and sea-worms. The termite or white ant is the most destructive on land, and the *Teredo navalis*, or marine worm, stands confessedly so in destructiveness to the timber in salt water, or that used in shipping, piling, and harbour works. Indeed, the *teredo* appears to have been known to Homer and Ovid, not to speak of other early authors. The gall-fly, or *cynips*, of various species, attack the oak, British and foreign. Many observers know those excrescences on the oak called galls. The insects or flies, in order to deposit their eggs, produce the puncture in the different parts of the tree. Each species forms a nidus peculiar to itself, varying in size from that of a pea to that of a nut, and sometimes larger. The shapes and colours vary and are variously disposed. Some are under the surface of the leaves, on the leaf-stalks, under the flower, on the smaller branches, bark, buds, and occasionally on the acorns. The imperforated, or those in which the worm has died, are the galls which are most esteemed. *En passant*, we may observe that, mixed with sulphate of iron in water, they form ink, or brown and black dyes, according to the proportions used. The progress of chemical science within the last half-century has greatly limited the utilisation of plants for dying and for other manufacturing uses, and the British oak, as well as other native and foreign trees and plants, have been similarly affected.

The subjects of the seasoning, preservation, and dry-rot of timber would need a treatise to describe the details. As regards oak, the same advice holds good as that written of other building timber. There are numerous artificial solutions and processes, steaming, water seasoning, and creosoting, the latter applicable as a preservative under certain conditions of use. After all that can be said, the fact remains that, for general carpentry, joinery, and furniture purposes, the old natural process of atmospheric seasoning, of cutting it and keeping it in stock for a considerable time, well ventilated, is the best, wherever it can be done. Well-selected and well-seasoned oak or other building timber needs to be well placed, and a practical knowledge of building includes the regulations of its disposition and safety under the various conditions of its use.

In conclusion, we will now observe that the oak has a magnificent history in all its aspects, historical, artistic, and mechanical. In Classic architecture and sculpture, the oak leaf as a foliage was utilised as well as the acanthus, the olive, and the vine; and in our own British Decorated Gothic the oak-leaf stands prominently in the capitals along with the ivy, white-thorn, vine, and other native plants. The workmanship of the Gothic oak roofs, porches, rood-lofts, screens, pulpits, and other ecclesiastical oak fittings and furniture, told well for the skill of the British craftsmen, and the same may be written of the oak staircases, groinings, and panellings in connexion with our old Domestic architecture. The design and execution of the carpentry, joinery, and furniture was a fit accompaniment to the masonic architectural marvels. Constructive carpentry of course originally led the way, but stone and timber, oak and oolite in Britain, for long centuries kept pace together. We will bring our theme to a close in the words of William Tighe, whose canto on the oak, as well as his other three cantos on the rose, vine, and palm, have never received the attention they merited. To a poetical faculty and a love of nature, Tighe added patient observation, practical knowledge, and statistical information in other directions. His notes to his cantos are, perhaps, more valuable than his muse, but of the oak he sings throughout enthusiastically and nobly,—

> "Long may
> The remnant, Britain, of thy forest scenes,
> Inspire the meditating bard, or fill
> The painter's eye with nature's bold design;
> Such as Salvator would have mark'd with iron
> And gaunt banditti, near the foaming lapse
> Of cataracts, that o'er the sombre rock
> Have cast the headless and uprooted Oak,
> Or such as, after Hexham's bloody field,
> Received the flight of royal Margaret.
>
> * * * * *
>
> Not Lithuania nor the swampy wilds
> Of Transatlantic forests can supply
> The elastic fibre, and the stubborn limbs,
> Of British growth."

Long live the oak, and may its fecundity, strength, and durability be typified in our trade, commerce, and national character.

THE SOCIAL SCIENCE CONGRESS.

THE special questions in the Health Department to be discussed at the Nottingham Congress, September 20th — 27th, are the following:—

1. How does the employment of mothers in mills and manufactures influence infant mortality; and ought any, and if so what, restrictions to be placed on such employment?

2. What reforms are desirable in the administration of hospitals?

3. What are the advantages of a system of notification of infectious diseases, and what are the best means of carrying the same into execution?

The following are arranged for the Art Department:—

1. On the new Royal College of Music.

2. In what way can the influence of art be best brought to bear on the masses of the population in large towns?

3. What are the proper limits of conservatism in regard to ancient buildings?

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PROPOSED FURTHER EXCAVATIONS AT EPHESUS.

THE SITE OF THE TEMPLE OF DIANA.

AN influential, though rather thinly-attended meeting, was held in the Mansion House on Monday afternoon, by the permission and under the presidency of the Right Hon. the Lord Mayor (Sir J. Whittaker Ellis, bart.), to promote the resumption of the important excavations made by Mr. J. T. Wood, on the site of the Temple of Diana at Ephesus. Letters cordially approving of the object of the meeting, but regretting the inability of their writers to attend, were read from the Prince of Wales, the Duke of Connaught, the Duke of Albany, the Archbishop of Canterbury, Cardinal Manning, the Earl of Shaftesbury, the Bishop of Durham, the Dean of Westminster, the Rev. Canon Farrar, Sir F. Leighton, P.R.A., and other gentlemen. Mr. Beresford-Hope, M.P., Mr. Alderman M'Arthur, M.P., Professor C. T. Newton, of the British Museum, Professor T. Hayter Lewis, Professor Donaldson, Professor Roger Smith, Mr. Watkiss Lloyd, and Mr. R. P. Pullan were amongst those present.

The Chairman, in opening the proceedings, said he had very great pleasure in allowing that meeting to be held in the Mansion House. The famous Temple of Diana at Ephesus, one of the seven wonders of the world, had been hidden from view for many centuries, and its exact site was unknown to the modern world until Mr. Wood, after six years of patient search, found the remains of the temple in the year 1869, more than 20 ft. below the present level of the ground. He understood that the trustees of the British Museum, who had previously supplied the means to explore some of the public buildings in the city of Ephesus, then authorised the exploration of the ruins of the temple, and five years were devoted to the work, with the aid of Government grants to the amount of 12,000*l*. In the year 1874 very important excavations at Babylon and Nineveh were being carried on by the English Government, and the Trustees of the British Museum resolved to suspend the work at Ephesus, as they thought it inexpedient at that time to apply to Government for a fresh grant for that purpose. Mr. Wood had from year to year applied for a grant to continue and complete the exploration of the site of the temple, but the times had been unfavourable for such enterprises, and there was little or no chance of Government aid being now rendered to the work. In the meantime, those portions of the site of the temple which remained unexplored were most likely to bring to light most valuable and interesting sculptures, which were cast by the fall of the temple beyond the limits of the present excavations. An influential committee, he was glad to say, under the patronage of H.R.H. the Duke of Albany, had now been formed, to resume the excavations by subscriptions, and Mr. Wood would explain to the meeting how he proposed to spend the funds which might be raised. Of the many interesting meetings which had been held in the Mansion House during his (the chairman's) year of office, there was none which was of greater interest than the one which he then had the honour to address. There had been, of course, meetings of greater public and social interest, but there was nothing more interesting than the pursuit of the history of the past as exemplified by architectural monuments. Just as Professor Owen was able to take a bone and describe from it the animal to whom it belonged, what the said animal lived on, and when he lived, so learned men were able, by the study of ancient remains, to make clear many obscure points in history. He therefore sincerely trusted that the movement to prosecute the explorations on the site of Ephesus would be attended with success.

Mr. A. J. B. Beresford-Hope, M.P., said he was glad to have the opportunity of supplementing by a few words the interesting remarks made by the Lord Mayor. Mr. Wood would tell the meeting what he had done, and would tell them what he meant to do, but he would not tell them of the infinite toil, labour, and heart-seeking energy and earnestness which he had thrown into the work. People who saw the beautiful sculptures from the Temple of Diana at Ephesus in the British Museum, all clean, neat, and white, would agree in saying what a delightful thing it was to have them, but the excavations which unearthed those treasures were not done in kid gloves. The reason why the fragments which had been found at Ephesus were so perfect was that for many centuries they had been buried beneath some 20 ft. of river mud,—beneath the bed of the Cayster. By following a clue given by an inscription which he chanced to light upon, Mr. Wood had succeeded in making a most ingenious series of discoveries, which would be found most graphically described by his friend Mr. Newton, of the British Museum, in his essay on the subject, first printed in the *Edinburgh Review*. Mr. Wood's excavations, it should be remembered, had to be done by men very difficult to control,—not by those respectable blackguard Christian drunkards the English navvies, but by lazy, unreliable, and treacherous Turks. But Mr. Wood had controlled them, and the results of his work were before the public. But it might be asked by some captious critic,—"If Mr. Wood's discoveries are what you say they have been, why does not the British Museum go on with the excavations on the site of the temple? Is not there a taint of suspicion in seeking to carry on by public benevolence a work abandoned by the British Museum?" As a trustee of the British Museum, he (the speaker) was able to say that that was not the case. At the present time ironclads and excavations would not lie down together. The lion ate up the lamb in this instance, and that a Government grant would be obtained for carrying on the excavations at Ephesus was, he believed, beyond hope. The British Museum, out of its slender grant for such purposes, had large demands made upon it at the present time for explorations at Nineveh, Carchemish, and other historic sites upon which great discoveries had been made, and where it was believed we were on the threshold of still further discoveries. He sincerely trusted that Mr. Wood would be enabled to pursue his explorations, because the Temple of Diana at Ephesus was not a mere duplicate of the Temple of Minerva at Athens, and still less so of the temples at Pæstum and Agrigentum, but it possessed features which stamped it as being the type of another and a different school of architecture, all the details of which could no more be mastered by the study of other known temples than the plan of a Norman cathedral could be taken as a safe guide to that of a Decorated building. Mr. Wood would tell the meeting of his great discoveries, and he would be followed by Professor Newton, great master as he was of archæology, who had also been at Ephesus, and had seen Mr. Wood at work.

Mr. J. T. Wood next addressed the meeting. He said his task was a very easy one, for he had to speak in a very good cause, which only required a plain unvarnished statement to be made to convince his hearers that it was well worth while to continue the excavations at Ephesus on the site of the temple. As there were probably some present who might not be able to call to mind exactly how the temple was found, he would, with the aid of the map exhibited, explain that point. He found, in reading ancient authors for information as to the position of the site of the temple in relation to the city of Ephesus, that they did not afford him any information, but directly contradicted each other. When, therefore, in 1863, he began his search for the temple, he had no idea on which side of the city to look for it, but he made experimental excavations on all sides, particularly towards the north-west, in which direction, in the opinion of eminent scholars, the remains of the temple would be found, but he met with no success there. After digging for more than a year with his own slender means, the trustees of the British Museum advanced him a small sum to continue the work. Without going into all the details of his subsequent operations, he might say that he explored the great theatre or Odeon, and in the course of the work he came upon the wall against which St. Paul must have rubbed his shoulder in trying to enter the theatre. He also came upon an inscription, which turned out to be a very opportune discovery, inasmuch as it confirmed him in the opinion he had arrived at as to the direction in which to look for the temple. The inscription, which was a very long one, was now in the British Museum, accessible to those learned in such matters, although not yet open, as it some day would be, to the public view. It described a certain number of golden images which were voted to Artemis, by order of one Salutarius, in the time of Trajan, in the year 104. These images, thirty of which were described in the inscription,—there might have been more, for the inscription was imperfect,—were ordered to be taken from the temple on certain days and brought through the city, entering the latter by the Magnesian Gate, and returning through the Coressian Gate, so making the whole circuit of the city. On finding that inscription he saw that he must discover those two gates before he could make much progress in his search for the temple, and he set to work and found the gates. He found that the road leading through the Magnesian Gate gave him the best clue, as the road was paved with marble, with four distinct ruts which had been cut into it by the wheels of chariots. The road through the Coressian Gate, not promising much, was abandoned. Having written to the trustees of the British Museum reporting the clues he had obtained, those gentlemen saw that he had very good prospects of success if he continued his explorations, and they, therefore, advanced him sufficient money to proceed with the work until he came to a still wider road, following which for some distance he came upon the angle of the peribolus wall,—a boundary defining the limits of the sacred precinct of the temple. In the wall he found an inscription stating that it was built by Augustus. He now knew that he could not be far from the remains of the temple itself. The destruction of the temple was achieved by the Goths about the year 262 of our era. It was known that the Christians did their best to destroy every vestige of it, and, therefore, instead of being able to trace the positions of the whole of the fallen columns, he could only trace the positions of four of them.* The Christians broke up the columns and made lime of them, in their endeavours to build a church on the site. Besides the remains of the columns mentioned, he had found a portion of the wall of the cella, and a piece of the lowermost step. When he came to excavate the area at the foot of the steps, he found very little remaining, and, unfortunately, at that time (1873-4) the trustees of the British Museum stopped their grants in aid of the continuance of the excavations. The thirty-six sculptured columns, of which remains had been found, were placed eighteen at each end of the building. The sculptured columns mentioned by Pliny were described as being sculptured upon their lower part with figures in full-life size. In the course of his explorations he had succeeded in finding the remains of five sculptured drums. In all probability the columns were not sculptured to a very great height, each column illustrating three separate subjects, and if there were a separate subject represented on each drum, there were originally about 108 of these beautiful sculptured drums. There was not the least doubt in his mind that if the excavations were continued more of these beautiful remains would be found. But, as he need hardly say, the most beautiful of the sculptures which adorned Greek temples were generally found in the frieze and in the tympanum in each pediment of the temple. In the course of his diggings he had come upon two stones which he believed to have been part of the frieze of the temple. Objection had been taken to his view of the matter, on the ground that if they ever did form part of the frieze, the frieze must have been considerably higher than was ordinarily the case in Greek temples. But it should be remembered that the Temple of Diana at Ephesus was unique among Greek temples. He thought he was warranted in assuming that further excavations would reveal further remains by the fact that in one small trench which he had opened a considerable distance beyond the general line of excavations, he had found the topmost stone of the cornice, with a stone belonging to the cymatium overlying it. The probabilities were great that a great deal of the remains of the temple remained undiscovered owing to the fact that the topmost stones of the temple would be projected to a greater distance from the steps than the fringe of 30 ft. at present excavated beyond the line of steps. He had carefully estimated the cost of the proposed further work of excavation, and a sum of from 4,500*l*. to 5,000*l*. would be required. If, as he firmly believed, further excavation led to

* In vol. xxx. of the *Builder* (1872), p. 106, we published a plan of the temple, together with a view of the remains of one of the columns, 6 ft. 1 in. in diameter, discovered by Mr. Wood in 1871. In the same volume (p. 726) we published a view of a portion of one of the drums of a sculptured column (Pliny stated that the Temple had 127 columns, thirty-six of which were, he says *cælate*, *i.e.*, sculptured in relief, one being by Scopas).

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further important discoveries, the money would be well expended. Personally he was willing to make any sacrifice in the matter that the committee were likely to expect of him.

Professor C. T. Newton, Keeper of the Greek and Roman Antiquities in the British Museum, said he had been desired to move the following resolution:—

"That the complete excavation of the Temple of Diana at Ephesus is an object well worthy of support from the nation, which now possesses, in the British Museum, the only portions of the beautiful sculptures as yet discovered of the temple, and that a subscription list be at once opened for the purpose."

He wished to say a few words on the probable chances of further discoveries at Ephesus, and what he had to say was from his own personal knowledge of the site where Mr. Wood had dug for so many years, and which he (the speaker) visited year after year, watching the progress of the work being carried on under Mr. Wood's direction. He had enjoyed the further advantage of having had under his charge in the British Museum those precious remains of sculpture, architecture, and inscriptions which were the fruit of Mr. Wood's long and laborious enterprise. In the course of the years that he had had those remains under his care, he had had the advantage of hearing the remarks which had been made upon them by the most learned archæologists, not only of this, but of all European countries, and he had learned a great deal more about them than was at first apparent on their discovery. He was convinced that the more those remains were studied, the more they would be found to contribute important evidence as to the history of Greek sculpture, and also to that great body of documents, Greek inscriptions. The practical question which the meeting had before it, and as to which the British public had a right to call for some sort of evidence, was, What is the chance of finding more interesting marbles in this great mass of soil, averaging 20 ft. in depth, and already excavated for some distance on each side of the site of the temple? Mr. Wood, in concluding his remarks, had stated a very important fact, viz., that he had found a portion of the cornice at a point almost on the extreme margin of the site. Now all Greek temples, so far as he had ever seen or heard, when they fell down, owing to earthquake or other causes, fell outwards, and the consequence was that the superincumbent mass of stone forming the architrave, frieze, and cornice was projected to a considerable distance. A sufficient area all round the site of the temple had not, he thought, been explored, and it would be a great pity, after the vast excavation had been made in the centre of the site, to be unable, owing to want of funds, to continue the exploration for some distance further round the excavation. Such further excavation was, he thought, calculated to lead to further important discoveries. He spoke from experience on the point, for when he explored the site of the Mausoleum at Halicarnassus he found very little indeed on the actual site of the monument. After the site had been ransacked he was advised to abandon further labours, but he went on working away from the centre, and was before very long rewarded by the discovery of the fragments of the colossal horse now in the British Museum. The presumption, therefore, was that continued excavations would lead to further important discoveries, for although it was no doubt true that the Christians broke up the remains of the temples with sledge-hammers, and burnt the pieces to make lime, there was no doubt that a great many large and important fragments escaped the general destruction. Just at the time when Mr. Wood had announced the discovery of a Doric portico close to the temple, he (Mr. Newton), like one of the three Fates, had to cut short the excavations by telling Mr. Wood that there was no more money available for the work. That Doric portico ought certainly to be explored. Again, within the peribolus or sacred precinct there were many accessories to the temple, all of which were of great interest. Within the sacred precinct of the Temple of Diana at Ephesus there stood, we know, a temple dedicated to Augustus (the Augusteon), of which Mr. Wood had found a portion in the shape of a beautiful pavement. On the site of this building they might expect to find statues of Roman emperors. Mr. Wood had not properly explored the site of this building, probably because he (Mr. Newton), when he was there, said "Don't let us waste any portion of our slender funds in exploring this Roman building." But the remains of this building and of the Doric portico ought certainly to be thoroughly explored. Indeed, it would be a national reproach if we did not thoroughly explore the whole site of the sacred precinct of the temple. Possibly a thorough exploration would lead to the discovery of tablets or slabs similar in character to those found by the French at Delos, containing lists of the treasures of the temple. The great temples of antiquity were banks in which people deposited their wealth, and from which other people received loans on giving proper security. Of all these banks of antiquity, the one which had the highest reputation in the ancient world was the Temple of Diana at Ephesus, which was to the ancients what the Bank of England is to us, viz., the one place where, if a man deposit his money, he is sure to get it back. There was, therefore, great interest attaching to the search for the archives of this great banking establishment of the ancient world. There was great reason for supposing that such tablets as he had spoken of were set up somewhere in the precincts of the temple. The great crop of inscriptions which Mr. Wood gathered at Ephesus was as yet very imperfectly appreciated, because it had taken years and years to put together the fragments which he had collected, and it was only within the last month that a letter from the Emperor Antoninus Pius had been considerably improved. Mr. Hicks, who was associated with him (Mr. Newton) in the publication of the Greek inscriptions of the British Museum, was now engaged upon Ephesus, and when the work appeared it would be seen that if Mr. Wood had done nothing more than to discover the inscription already mentioned, the outlay which had been incurred had been well bestowed. The outlay, amounting to about 12,000*l.* in all, was most insignificant for a country like England, particularly when it was remembered that the whole of that sum was not voted by Parliament, but that a considerable portion of it came out of the sum allotted to the British Museum for the purchase of works. So important did he (Mr. Newton) consider Mr. Wood's work at Ephesus, that he was content to sacrifice his grant for a few years in order to provide a portion of the necessary funds. But the whole sum of 12,000*l.* was nothing compared with what the Germans had spent at Olympia, and what had already been achieved at Ephesus was due not to any national effort, but was the result of the energy and enthusiasm of one man. He cordially moved the resolution the terms of which he had read.

Professor Donaldson said he had very great pleasure indeed in seconding the proposition. In years gone by he had travelled all over Asia Minor, and could fully bear out what had been said as to the possibilities of further discoveries being made. He had no doubt that if Mr. Wood returned to continue his excavations some very interesting fragments of the temple would be brought to light.

Mr. R. P. Pullan supported the motion, and said that, as a fellow-excavator and explorer, he felt bound to testify to Mr. Wood's wonderful perseverance. He saw him at Ephesus when he was digging in the Odeon, when he had found the Magnesian Gate, and again when he had found the corner of the peribolus wall. The discovery of the remains of the temple was a great triumph for Mr. Wood, for a more unpromising site for the excavator could hardly be conceived.

Professor T. Roger Smith said he was happy to be allowed the opportunity of supporting the motion. Nothing in the present day was more remarkable than the way in which the records and monuments of the past were being brought to light. We had seen Olympia explored; we had witnessed the grand discoveries that Mr. Newton had made (and which had been so briefly alluded to) at Halicarnassus; and then we had had the extremely interesting discoveries of Dr. Schliemann; but he thought that, of all the discoveries of recent years, there was none of which we might be more justly proud than the discovery of the Temple of Diana at Ephesus. He sincerely trusted that the movement would have a successful result, and that the necessary sum of money would be raised to enable Mr. Wood to carry on and complete his investigations, which there was every reason to believe would be crowned by important discoveries.

The resolution was carried unanimously.

Mr. Alderman M'Arthur, M.P., moved, and Professor T. Hayter Lewis (hon. sec. to the fund) seconded, a vote of thanks to the Lord Mayor for presiding, and for allowing the meeting to be held in the Mansion House, and the meeting terminated.

THE WORCESTERSHIRE EXHIBITION.

UNDER the presidency of the Earl Beauchamp, Lord Lieutenant of the County and City of Worcester, and supported by a distinguished list of vice-presidents, an exhibition was opened at Worcester on Tuesday, the 18th inst., in the large building originally built for the Worcester Engine Works Company, at a cost of nearly 100,000*l.*, close to Shrub Hill Railway Station, on the Great Western and Midland Railways. In 1872, the property was acquired by the West Central Wagon Company, Limited, who carried on the business until 1875. Since that time the building has not been used. The conversion of the building from a huge deserted factory into an exhibition building has been the work of some months. In February, Messrs. H. Rowe & Son, architects, were instructed to prepare specifications of the repairs; and tenders were speedily obtained. That of Messrs. Binnian & Son, of Kidderminster, for 995*l.*, was accepted. Additional tenders of Messrs. Binnian have since been accepted for the erection of orchestra, lavatories, and other adjuncts. An ornamented iron verandah for the entrance to the building was supplied by Messrs Hardy & Padmore. The entire cost of adapting the building may be set down at about 2,000*l.* Rarely have so many important objects been brought together for the purpose of a county exhibition, and it is not too much to say that the show will well repay a long journey on the part of the visitor. The sections are:—1, Fine arts, under the chairmanship of the Very Rev. the Dean of Worcester, Lord Alwyne Compton, with a sub-division of art needlework, presided over by Lady Alwyne Compton; 2, Industrial, under the chairmanship of Mr. Henry Willis; and 3, Historical, under Rev. Canon Butler. The important towns of Dudley, Evesham, Kidderminster, and Stourbridge, contribute local committees towards the management, and nothing seems to have been omitted, on the part of those who have promoted the affair, that could be material to its success. The honorary secretaries have indeed worked indefatigably since the inception of the undertaking, and the city may be congratulated upon having had the services of two so able men as Mr. R. W. Binns and Mr. C. M. Downes. In the Fine Arts section, there are three galleries containing bronzes, and marble and plaster groups. Among them we notice the "Caractacus" of J. H. Foley; Marochetti's marble bust of the late Lord Hampton; Roehm's "Leonora"; Canova's bust of Napoleon I. Almost in the centre of the nave is T. Brock's bronze group entitled "A Moment of Peril," lent by the Council of the Royal Academy, by whom it was purchased for the nation under the terms of the Chantrey bequest. The sculptor is a native of the city. The South Kensington Museum has, with generous liberality, lent eight cases filled with a large number of choice specimens of art, each one being described with date of origin, style, and value. The objects consist of Indian armour, such as shields, daggers, sheaths, maces, sabres, and knives, Indian silver work, jewelry, and jade, among which are boxes, sprinklers, vases, and some handsome dress weapons; Japanese lacquer-work of great antiquity and elaborate design; Oriental pottery of various forms, all beautiful and many remarkable for originality of shape and colouring; Italian bronzes, chiefly ewers, statuettes, and candlesticks, many of an early period; some wonderful pieces of early hammered ironwork; and electrotype reproductions of royal, collegiate, and corporation plate. Mr. F. Elkington lends two cases, one of magnificent Chinese enamelling on metal, early *cloisonné*; the other of Japanese enamelling of the same kind. One of these latter specimens is a vase of the finest antique *cloisonné* executed at the period when the metal wire tracery was very minute in detail, and the art of the enameller had reached its highest point of perfection. Lord Beauchamp's Sèvres china (Case 16), some showing the handiwork of Castel, Pfeiffer, and Prevost, others of turquoise blue and Bleu-de-Roi; his Limoges enamels (Case 17), and the copiously illustrated series of [illegible] plaques, old Worcester porcelains [illegible] porcelains, and

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Battersea enamels, easily and justly claim a very high degree of praise, and speak volumes for the taste of their possessors and for the liberality with which they have contributed their treasures towards the exhibition which their county or their country has inaugurated. The transfer printed porcelain of Worcester, in black or colours, made at first at Battersea by Alderman Jansen, and Worcester enamel painting, 1751-83, are represented by many valuable and typical examples of pottery. Among the miscellaneous art-pieces in this section we may refer more especially to Captain Castle's collection of choice blue and white porcelain; Mr. M. Tomkinson's Japanese ivory carvings, and Mr. Dyer Longstaffe's ivory diptychs. Of the latter, one is attributed to the date of about A.D. 1200. The subject is the Crucifixion with the Tau-cross. It may be compared with a sculpture in the College at Durham. A stole in the same case (No. 25), and attributed to the remote period already mentioned, should have properly been placed in the art-needlework court. To this section the Venice and Murano-Venetian Glass Company contribute some clever and beautiful glass.

Around the sides of the fine-arts galleries a very important collection of ancient and modern paintings in oil colours has been grouped in a most instructive manner by Mr. Pollen, of the South Kensington Museum. Gallery No. 1 is devoted to the old masters and deceased British painters. Among them may be specified Lely's portrait of Blow, the music composer,—a figure painted on copper by Angelica Kauffmann. A goodly series of masters' and artists' names testify to the extreme desire which the exhibitors have universally manifested of freely lending the most valuable of their art-treasures towards the enhancement of this portion of the exhibition. Passing rapidly in review these paintings, we have only to notice the portraits of William, Lord Craven, and of Lord Stafford, by Vandyck, a portrait by Hogarth, works of Ary Scheffer, Sir J. Reynolds, Landseer, Etty, Sir Geo. Hayter, Greuze, Lely, Rubens, Gainsborough, Rembrandt, Ghirlandajo, Van Eyck, Holbein, and Quintin Matsys, to show how representative the exhibition is, and over how wide a field of art the examples range. Of the modern school exhibited in the Gallery No. 3 the works of Mr. B. W. Leader, a Worcestershire artist, claim especially the attention of the visitor for the clear transparency and sense of air and light which they possess. In this gallery also are many from the brushes of Messrs. G. F. Watts, T. S. Cooper, Professor Richmond, Val-Prinsep, T. F. Dicksee, Ansdell, Holl, and other members of the Royal Academy. In Gallery No. 4 are specimens of Rubens, Teniers, Ruysdael, Wouverman, Rembrandt, and Gerard Dow; Ang. Kauffmann's portrait of herself; Teniers, Gainsborough, Guercino's Samson giving the honeycomb to his parents; Morland's portraits of the Gunnings, Elizabeth as the ironer, and Maria the starcher; Paul Veronese's "Adoration of the Magi"; and a large number of fine and well-known paintings. The total number reaches to nearly 500. The water-colours are also numerous, among the artists being D. G. Rosetti, R. Doyle, Copley Fielding, Birket Foster, and J. M. W. Turner. Several charcoal drawings by D. Cox are interspersed with these. The portrait of the late Lord Beaconsfield, by Millais, in the possession of Mr. W. H. Smith, M.P., will attract considerable attention when it is exhibited in this section. The final sittings for the portrait had not been given when the illustrious statesman was seized with his fatal illness in the spring of last year. It will not be placed in the Worcester Exhibition until the last week of August. The total number of objects coming under this division of the fine-arts section is 720.

Art-needlework occupies a prominent position in the exhibition. It consists of 245 numbers gathered together and arranged in an instructive display by Lady Alwyne Compton, assisted by Mrs. G. E. Martin, Lady Catherine Berkeley, Mrs. Goldingham, Lady Georgina Vernon, and other members of the special sub-committee. The rich stores of this favourite Mediæval employment which are still extant throughout the country have been considerably drawn upon to furnish this remarkable, and, indeed, unique branch of the exhibition, and those individuals and bodies who have the privilege of possessing typical specimens of the needle's art have contributed them with great generosity on this occasion. Out of the great number of entries in the catalogue, we can only find space here to draw attention to a few examples. A cope, two dalmatics, and a chasuble (Nos. 49—53), all of the fifteenth century, and of extraordinary beauty and execution, appear to be of the best period of Flemish art. The subjects are derived from the life of our Lord. This comes from St. Mary's College, Oscott. A chasuble of old flowered stuff (No. 94) is attributed to the fourteenth century; on the orphreys is depicted in silken stitches the history of St. Joachim and St. Anna, the parents of the Blessed Virgin. Nos. 95, 96, are two other chasubles of the same century, the one bears Gothic flowers and fleurs-de-lis, embroidered on satin; the other is composed of cloth of gold and crimson, with orphreys of red velvet enriched with small figures under fine Gothic canopies. The examples attributed to Rhodian (No. 125), Cretan (Nos. 120, 126), and Bulgarian (No. 127) needleworkers are interesting for comparison with the productions of better-known schools. Lord Arundel of Wardour sends the "Westminster Vestment," a chasuble of Flemish work, dated 1468—1509; and the Principal of Stonyhurst College sends, among other early vestments, a chasuble made up of old orphreys of two periods, the middle and end of the fifteenth century. In the front is a representation of the tragic death of St. Thomas of Canterbury, under a canopy formed of one bay of Canterbury Cathedral. The side-strips of the back are of the same style of work, and were probably made by or for the monks of Canterbury as they represent events in the lives of SS. Thomas, Dunstan, Alphege, and Odo, saints especially venerated at that place. The modern specimens of needlework are all beautiful and artistic. As one looks at them the hope arises that this art, now too frequently despised or neglected by English ladies, may hereafter become as popular among them as it was in the sixteenth and seventeenth centuries. The needle-worked miniature portraits of royal and historical personages of the seventeenth century are valuable, not so much for the fidelity of their portraiture, as that they indicate very clearly the popularity of the art as an educational accomplishment at that period. For the same reason, great interest attaches to the lace canopy said to have been worked by the ill-fated Queen Anne Boleyn and her ladies for the christening of the Princess Elizabeth (No. 156), and the christening robe and mantle said to have been worn by that princess, which have been preserved in the Lawson family, descended from Queen Katherine Parr; these are exhibited by Mrs. Dent, of Sudeley Castle. Samplers and objects of infant attire or domestic employment abound in this division of the attractive and prominent exhibition.

The Historical Section, in the centre of the First Court, is surrounded by the Fine Art Section which has just been noticed. It consists of a very copious and representative collection of portraits of Worcestershire worthies and historical personages connected with the county. The portraits include members of the Royal family and nobility, bishops and ecclesiastical dignitaries, officers of state, statesmen, divines (orthodox and unorthodox), historians, and artists. There are three portraits of Richard Baxter, the great Puritan of Kidderminster, whose effigy in marble by Brock, the Worcester sculptor, has been lately erected in that town. The archæological objects connected with this section are, *inter alia*, charters, books (both manuscript and printed), coins, tokens of Worcestershire tradesmen, standard weights and measures, casts of Worcestershire seals, antiquities found in excavations recently made in the county, armour, views, and miscellaneous prehistoric, ancient, and Mediæval relics, illustrating the past condition of the shire and its borders. Among all this great collection of materials, out of which, as the Rev. Canon W. Butler eloquently remarked at the Guildhall dinner given by the Mayor of Worcester in recognition of the press view, a new history of Worcestershire might well be written, we have room to mention but very few special points. Mr. W. de Gray Birch, F.S.A., has arranged five cases of charters and a special series of manuscripts, including *fac-similes* of Anglo-Saxon charters, formerly belonging to the archives of Worcester Cathedral, and relating to the ancient landed property of the see; some early palæographical and historical pieces selected from the library of the Dean and Chapter; a selection of the most ancient and important charters and Royal privileges bestowed by English sovereigns on the corporation of the city; the borough charters of Bewdley and Evesham; and an extensive series of documents belonging to the corporation of Droitwich, many of which throw a new light upon the history of the salt-making industry of that ancient site. In succeeding cases may be observed, among a vast number of valuable objects that cannot be here enumerated, a series of Royal autographs; another of early block-books and rare printed books, belonging to the Rev. F. Hopkinson and others; some choice books and illuminated MSS., belonging to the President (Lord Beauchamp) and others; a large assortment of Worcestershire geological and palæontological specimens; a selection of works of local interest exhibited by the Worcester Public Library Committee; R. Baxter's great work entitled "Saints' Everlasting Rest," with his autograph dedication to the high bailiff and burgesses of Kidderminster, in whose possession it still remains; British, Roman, Saxon, Danish, and Mediæval weapons, ornaments, and pottery, from various excavations and local finds; and, finally, in Court No. 2 is an arrangement, by Mr. J. S. Haywood, of old English furniture to illustrate a rush-strewn room in a Worcestershire house of the eighteenth century. In this the carved oak chairs, the Worcester china tea-set, the spinning-wheel, the wooden trenchers, and the pewter plates and dishes, tinder-boxes and mirrors, stands of flint-lock guns, leather bottles, *et hoc genus omne*, vividly recall to the spectator a similitude of what must have formed the every-day common-place of our ancestors' lives. The industrial section, we fear, cannot be described on this occasion. We can only say the boot and glove making by machinery, the show of wool-combing, carpet-making, horn-turning, needle-polishing, and other machinery, the potter's wheel and the Parian china moulder's bench, the carriages, food products, paper, salt, iron, tinned and japanned ware, and, above all, for beauty, the modern Worcestershire pottery and glass will well repay a lengthy visit to the faithful city which is now *en fête* for the auspicious event which has already achieved a moral, and we trust will achieve a practical and financial, success. When the fortunate owners of so many rare and valuable objects of art, and the manufacturers of the staple productions of a shire which may be favourably contrasted with any in England, so cordially unite in their respective contributions to so practical an end as a county exhibition, it is not likely that intelligent visitors,—those seeking technical instruction in the arts,—and even holiday-makers, will be wanting to throng around its courts. If the authorities, who undertake the management of the exhibition, act upon a happy suggestion made at the opening ceremony by the president, and organise a series of lectures in connexion with the exhibits, this rich collection of works of art and industrial products may be turned to more immediate and direct uses, and thereby not merely the amusement of the rich, but the education of the artisan will be advanced, and the contributors will reap the satisfaction of having "helped to place within the reach of the artisan and mechanic a fine collection of art-treasures which gives them an admirable opportunity of studying the practical application of the principle of beauty of design." These are the sentiments upon which hinge the life and success of the exhibition.

THE RUSSIAN CHURCH, DRESDEN.

FOLLOWING up the accounts we have recently given of the growth and progress of Russian house-building, we publish in our present number an illustration of a characteristic specimen of Russian church architecture. Its architect, Harald Julius von Bosse, of St. Petersburg, has strictly followed the traditions of that style, and on that account alone the church forms a conspicuous landmark among the architectural monuments of Dresden. But it possesses also other features, not the least of which is the close adhesion to the rules of old Russian church building. The architect was assisted in his work by Herr Karl Weissbach and Herr Ernst Becher. The frescoes are by Mr. James Marshall. Room is provided in the church for 300 worshippers. The cost of the building, close upon 25,000*l.*, was defrayed by voluntary contributions, chief among whom was that from Herr Simeon von Wikulin, Russian State councillor, a resident of Dresden, over 21,000*l.* The site was given by another Russian, of German extraction, Herr Alexander Wollner. The church was opened a few years ago.

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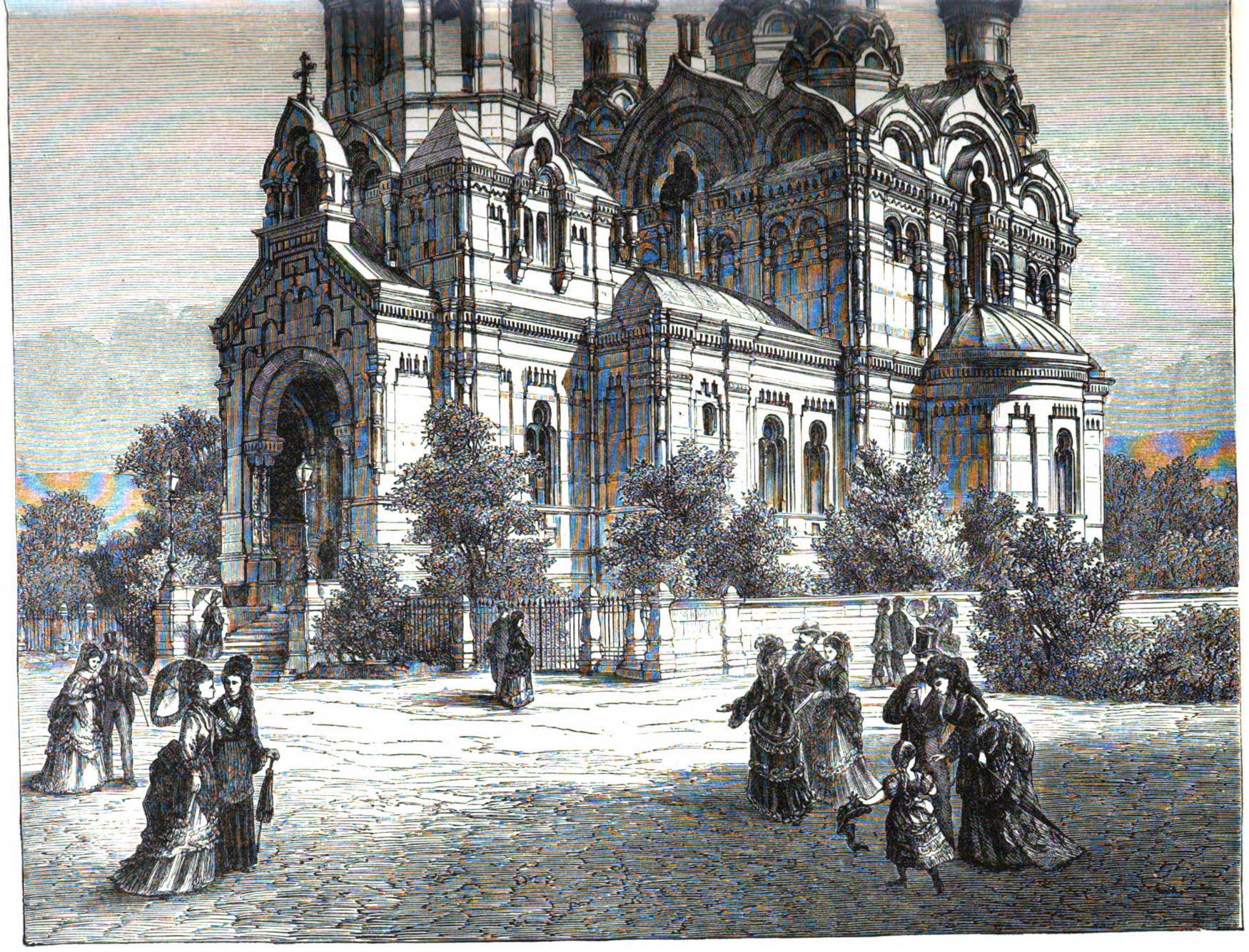

THE RUSSIAN CHURCH, DRESDEN.——Herr Harald Julius von Bosse, St. Petersburg, Architect.

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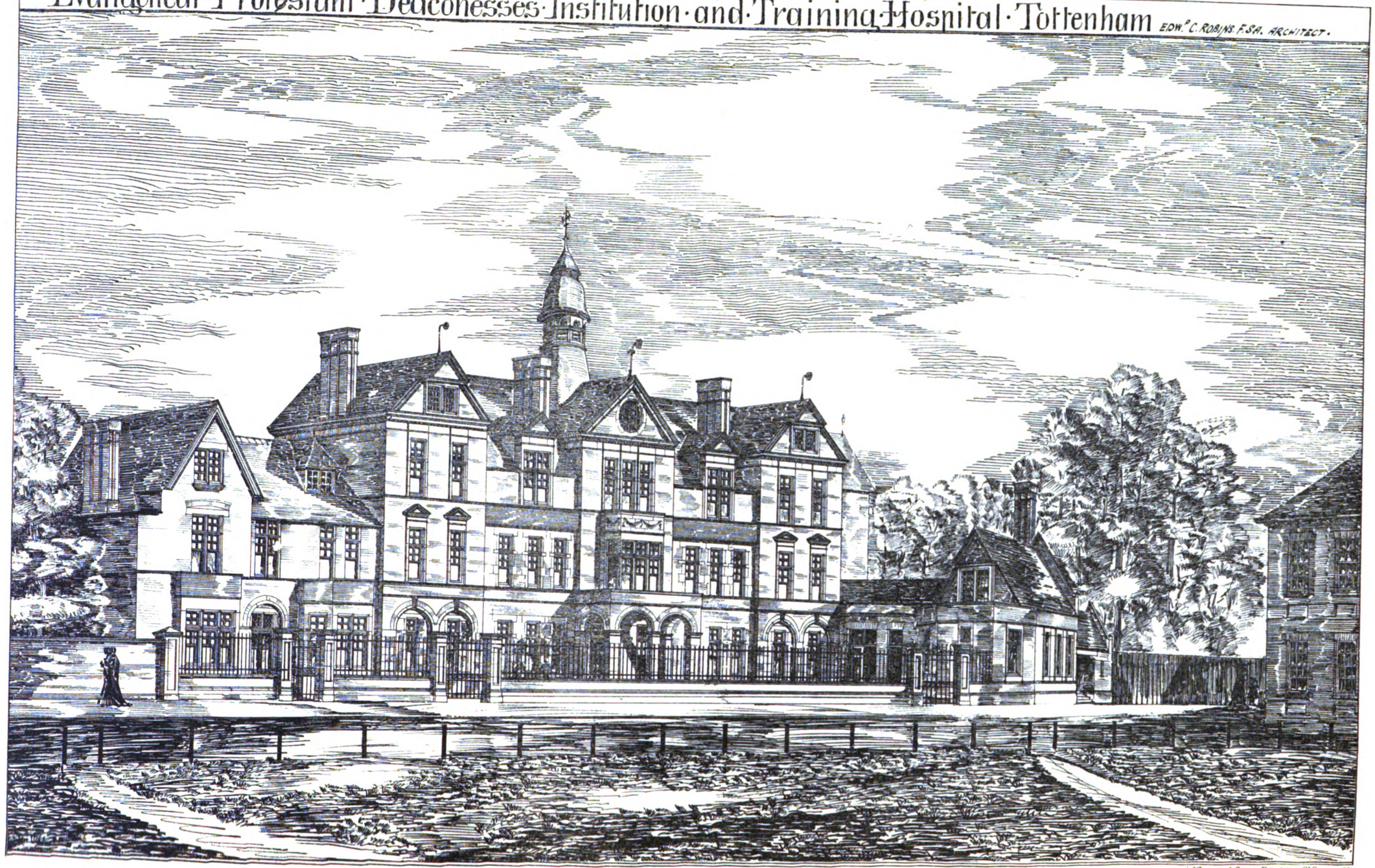
Evangelical Protestant Deaconesses Institution and Training Hospital Tottenham

EDW.D C. ROBINS F.S.A. ARCHITECT.



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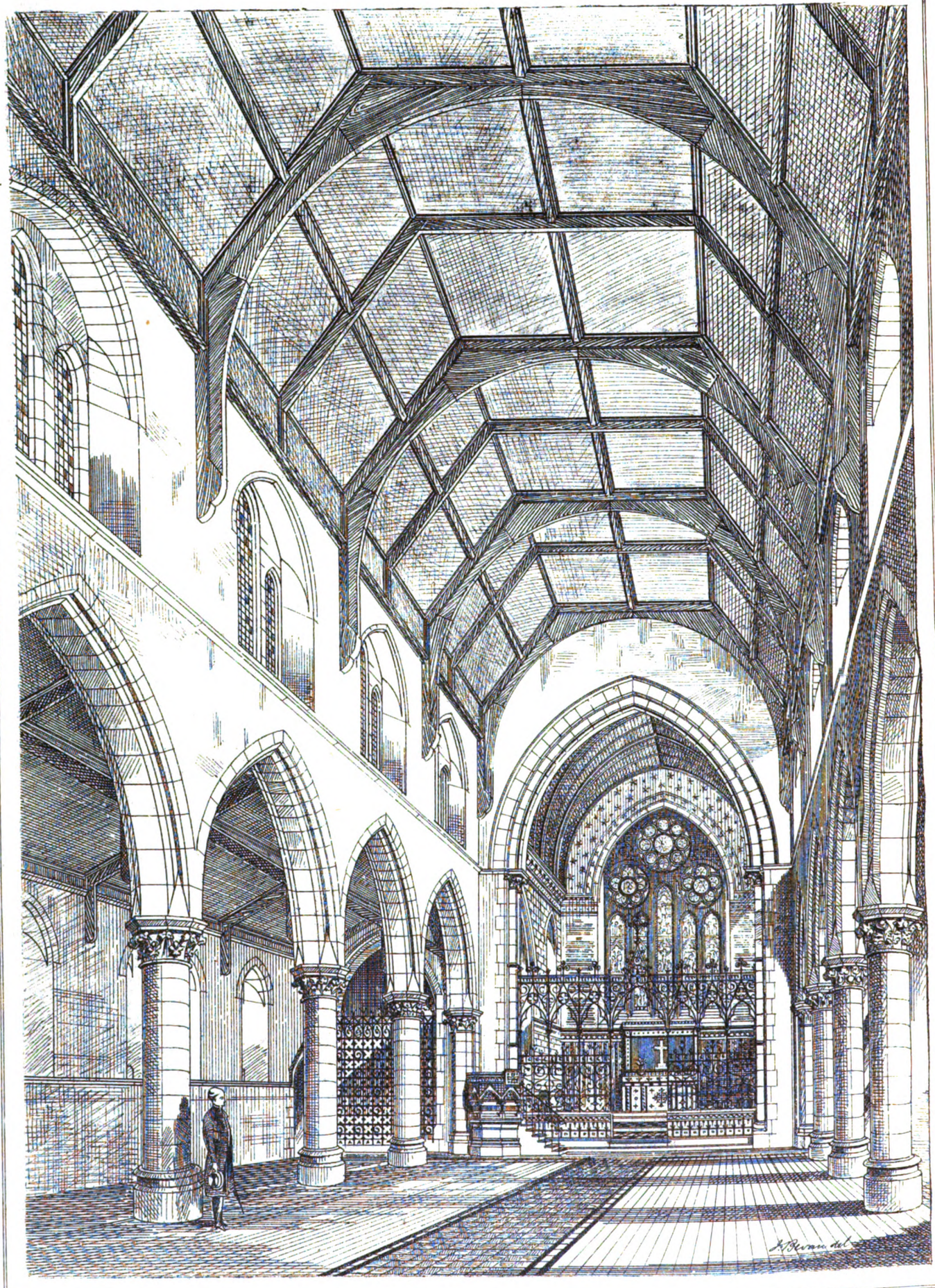

PROPOSED · CHURCH · OF · SAINT · SAVIOUR · WOOLCOT · PK ·

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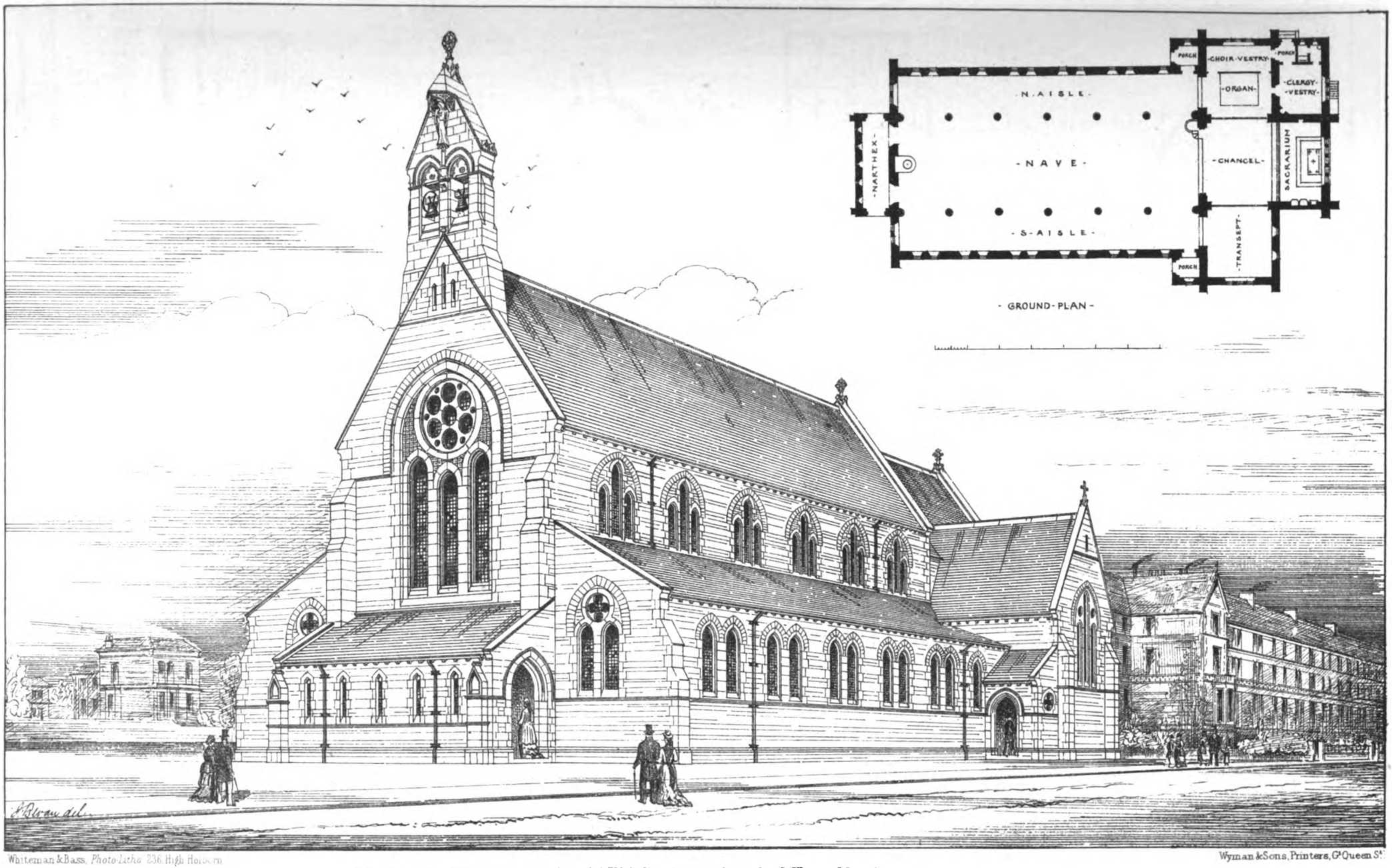

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PROPOSED CHURCH OF ST. SAVIOUR, WOOLCOT PARK.—MR. JOHN BEVAN, ARCHITECT.

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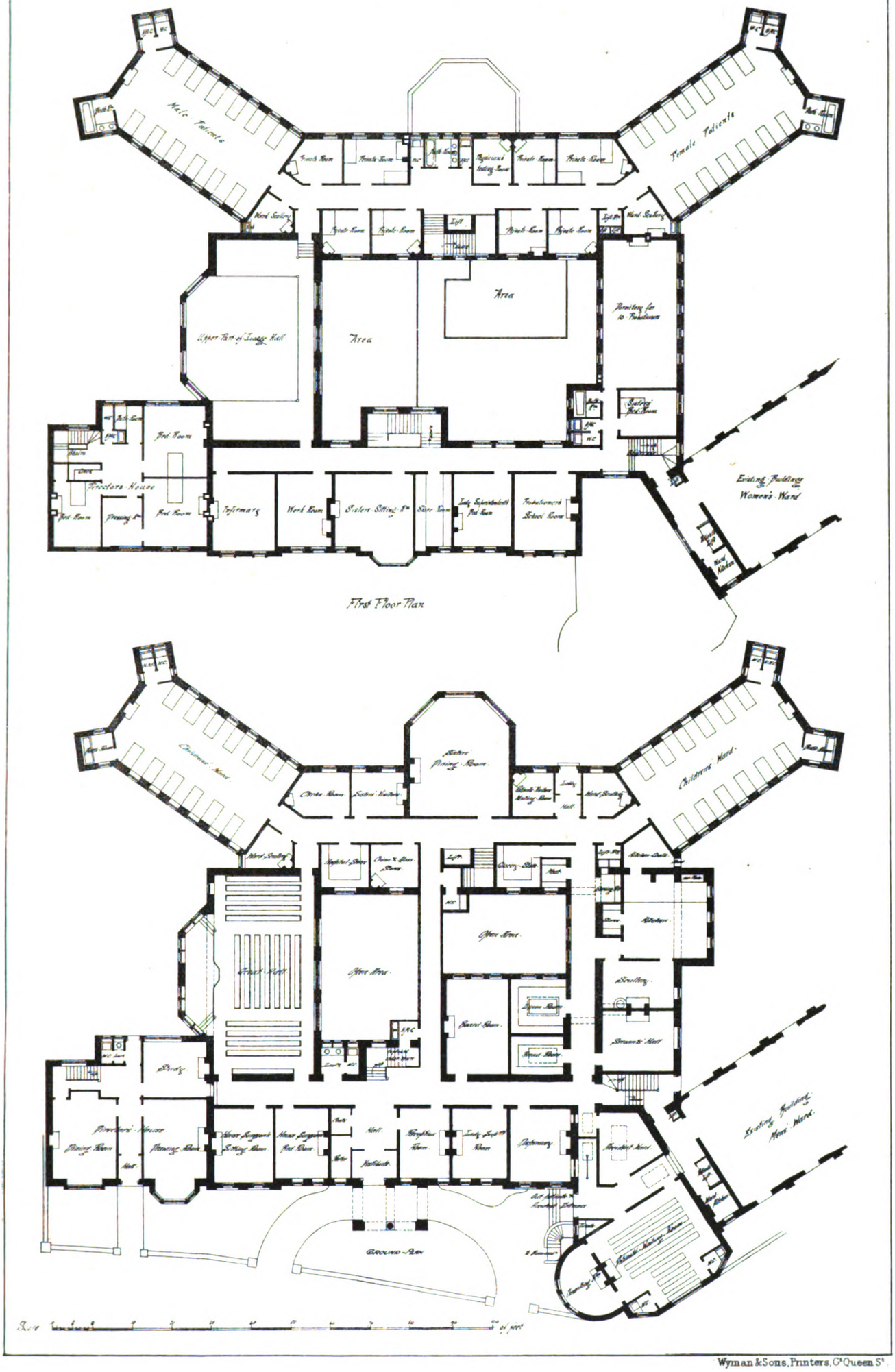
EVANGELICAL PROTESTANT DEACONESSES' TRAINING HOSPITAL, TOTTENHAM.



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THE EVANGELICAL PROTESTANT DEACONESSES' INSTITUTION AND TRAINING HOSPITAL, TOTTENHAM.

WE give illustrations of the design selected in the recent competition for the above proposed building submitted by Mr. E. C. Robins, F.S.A., being a perspective view of the principal front towards Tottenham-green, and plans of ground and first floor.

The line of frontage is nearly the same as that of the old building, which is to be removed, leaving only the more modern men and women's wards, which will be incorporated with the new structure.

A quadrangular arrangement has been adopted. The administrative block is that shown in the view given towards the west; at the northern end of which is the director's house, and at the southern end the out-patients' block of single-story buildings. The hospital block faces the east, and the fine garden grounds in the rear, and is connected with the front block by the assembly-room in the northern side of the quadrangle, and by the kitchen block on the southern side.

There are five entrances from the public road, viz., the entrance to the director's house, the principal entrances in the centre of the administrative block with *porte cochère*, the accident ward, the out-patients', and the carriage entrance to the rear of the hospital block beyond the old wards.

The administrative, or western block, is three stories in height (except where a basement occurs at the southern end), in the centre of which is the prinoipal entrance; on the left is the porter's room and the apartments of the resident surgeon; on the right is the reception-room, the lady superintendent's room, and the dispensary.

On the eastern side of the corridor are the chief staircase, the board-room, the linen and bread store-rooms, lavatory, and w.c.

The rooms over, on the first floor, are the separation ward, the workroom, the sisters' sitting-room, the lady superintendent's room, and store-room adjoining, all overlooking the green.

The sisters' separate bedrooms for thirty sisters, with bath-room and w.c., occupy the second floor.

The usual accommodation is given to the director's house.

The out-patients have a large waiting-room, to be entered by the accident-ward entrance or round the south-west corner next the old wards. Conveniences for both sexes are provided. The semicircular room at one end is the consulting-room with two doors. There are entrance and exit doors from the waiting-room to the wide corridor, between it and the accident ward (lighted by skylights), whence patients can leave by the accident entrance or pass on to the the dispensary double-hatch, returning round railing provided, and then out either by the way they came or by the accident entrance. These out-patients will not enter the building beyond the dispensary lobby, on the other side of the closed end of which is the sisters' dispensary hatch. An out-patients' ticket-office is provided.

Accident cases, on stretchers or otherwise, enter by the wide doorway, and can be taken at once through the corridor into the men's wards, or by the lift fitted up in the old hospital lobby to the women's ward, first-floor.

The present staircase here is to be removed, and the new staircase at the south end of the western corridor to be used instead, access being arranged therefrom to both the old and new buildings. A food-lift is also provided, and ward kitchens, one over the other, where shown.

Alongside the accident entrance are the steps to the basement, in which are the various store-cellars, heating and steam pumping apparatus from the deep well, &c.

The southern block contains the servants' hall, and kitchen, scullery, and other domestic offices. A special coal-cellar is provided for the kitchen use, and a food-lift for patients in the hospital block, balanced by a coal-lift adjoining.

A sisters' serving-lobby communicates by a hatch with the kitchen, in easy communication with the sisters' dining-room, which is in the centre of the ground-floor of the hospital block, overlooking the grounds, which contain some fine old trees. Over the kitchen offices are the ten probationers' dormitory and bath-room, on the first floor, and the servants' dormitories, &c., on the second floor.

The hospital block, on the eastern side of the quadrangle, is two stories high, and contains four large sick-wards, for twelve beds in each, allowing, 1,200 cubic feet to each bed, with the usual overlooking nurses' room and ward scullery to each. Those on the ground-floor are children's wards. It will be observed that the axis of the wards is nearly north and south, but that, to obtain the cross-ventilation by windows (which is so necessary occasionally to resort to, and which no other ventilation can entirely supersede, though it must not be exclusively depended on), they are set at an angle parallel with the old wards, as shown.

The bath rooms, lavatories, water-closet, and slop-closets are situated at the angles of the wards, and are not only cross-ventilated, but the lobby has inlets and outlets for warmed air, raising the temperature above that of the ward, so that the tendency shall be to withdraw the air from the ward, and not the reverse, as is far too common.

Open fire-stoves, with fresh warmed air passing vertically through them, are in every ward, which is also heated by the waste steam from the steam-pump boiler after it has served the kitchen for cooking purposes. On either side of the sisters' dining-room are the patients' visitors' and sisters' visitors' waiting-rooms, clerk's office, medical and hospital stores, &c. The staircase is in the centre of the western side of the block. The patients' lift occupies the well-hole, and is easy of access, either from the rear garden carriage-entrance, or from the main front entrance, by the covered corridor across the quadrangle.

The first floor of this hospital block contains the first and second class wards and separate chambers for paying-patients of both sexes. The sick wards are like those below, but between them are arranged the private room wards, with lavatory and water-closet, &c., opposite the staircase.

The northern enclosure of the quadrangle is formed by the large hall for 250 persons, which is accessible from the first floor to the galleries provided.

The simplest materials will be used in the construction generally, dependence for effect in the design being entrusted to the general outline and to its fitness for the ends in view, rather than to expensive details.

Arrangements are to be made for withdrawing the vitiated air and warming the incoming fresh air, and for producing in all seasons a continued exchange of pure for expired air. The sanitation of the building generally will otherwise be attended to.

ST. SAVIOUR'S, WOOLCOT PARK, BRISTOL.

THE consecration of this church, with the exception of the part unfinished on the south side, has taken place recently, and we now give an interior and an external view of it. The church has been erected from the plans of Mr. John Bevan, of Bristol, whose design was selected in a limited competition on the award of the late Mr. Benjamin Ferrey, F.S.A. Mr. Bevan had previously identified himself with the ecclesiastical architecture of the city by the churches of St. Nathanael and St. Werburgh, Baptist Mills. The style of architecture of St. Saviour's is Early French Gothic of a massive type, and having to depend for effect more upon the proportions of his building than upon ornate carvings or elaborate decorations, the architect has been very successful in his design. At the west end, and springing from the gable, is a lofty bell-turret containing two bells, and with a canopied niche at the apex containing a figure of our Lord as the Good Shepherd. The principal entrance is through a narthex at the west end. The width of the nave, with north aisle, is 41 ft., and the length 93 ft., while from the floor to the apex of the roof is 38 ft. The chancel is 38 ft. long by 25 ft. wide and 52 ft. high, having on the south side two sedilize, piscina, and credence-table; and on the north side an aumbrye, or locker. The nave is divided from the aisles on either side by six arches and columns with capitals. The chancel-arch is 20 ft. wide and 38 ft. high to the point of the arch. The nave and aisle roofs are open-timbered, with plaster between the rafters; and the chancel and organ-chamber roofs are boarded with moulded ribs, dividing them into bays and panels. The whole of the roof-timbers are left without stain or varnish upon them, with the hope of their being stencilled with colour at no distant date. The nave is lighted by two-light windows in the aisle-walls, and by three-light windows in the clearstory. The west window of the nave and the east window of the chancel are large and, though somewhat severe in treatment, handsome, and thoroughly characteristic of the period of work adopted. These are all filled with cathedral glass of pale tints, in geometrical patterns, by Mr. Ben Gray. The church is paved throughout with tile, that in the chancel being more ornamental than the rest. The pulpit is octagonal in form and divided into panels, with columns of polished Devonshire marble, supporting carved capitals at the angles; Irish green and other marbles being used for inlays. The centre panel contains the subject of the Sermon on the Mount, the other panels emblematical foliage. The re-table is of alabaster, supporting a cross, with a dossel behind it. The steps to the sacrarium are of polished Devonshire marble, presented by the builder. The warming of the church is by means of hot water, circulating at low pressure; this portion of the work having been carried out by Mr. Vincent Skinner. The carving, so far as it has gone, was executed by Mr. Sheppard. The builders are Messrs. Cowlin & Son. Their contract for the building as it now stands was 4,100*l.*, but they are bound under an agreement to complete the entire building for a further sum of 739*l.*, should they be called upon to do so within a period of one month from the present time; but these sums do not include heating apparatus, pulpit, lectern, and other fittings.

BUILDING IN BERLIN.

BERLIN, which has doubled its population within twenty years, and which now numbers nearly 1,200,000 inhabitants, has naturally in recent years been the scene of very extensive building operations. A statement which has just been presented to the municipal authorities helps to give some idea of the scale upon which the building trades have been recently employed in the capital of the German empire. The chief burgomaster, in proposing to the Council the issue of a new Four per Cent. Municipal Loan for 45,000,000 marks, or 2,250,000*l.* sterling, gives a survey of the city expenditure on the new systems of drainage, &c., since the year 1875. It appears that upon that object the total sum spent within the past seven years has been 71,600,000 marks, or 3,580,000*l.* sterling. The municipality had purchased eleven large estates in the vicinity of Berlin for the purpose of receiving the sewage of the capital, and the expenditure on them had been 21,500,000 marks, or 1,075,000*l.* sterling. Since the year 1878 no less than 10,580,000 marks (529,000*l.* sterling) had been expended on new bridges in the city over the various arms of the river Spree. The Central Police Office is another work the city is about to undertake, the total cost of which will be 300,000*l.* sterling. Three new infirmaries or hospitals, having a total of 1,000 beds, are also to be built, at a total cost of 175,000*l.* sterling. The new waterworks, only built a few years ago, are already insufficient to supply the wants of the growing city, and are to be enlarged, at a cost of 130,000*l.* The great Central Cattle Market, commenced in 1878, has already had 550,000*l.* spent upon it, but will in the end cost a considerable additional sum. It is also intended shortly to commence new and extensive market-halls, for which the Council are asked to grant 500,000*l.* sterling as a first instalment. A sum of 87,500*l.* is also asked for new streets. Another great work, which was only completed a few months back, is the City Railway,—an inestimable boon to the inhabitants, who, in spite of the increase of tramways and omnibus lines, would have been badly off for the means of travelling from one part of the city and suburbs to another but for the new Stadtbahn. The increase in the number of dwelling-houses is quite on a par with the progress evinced by these great public works. Berlin every year requires sufficient new dwelling-houses to accommodate nearly 30,000 people.

EDWARDS, ARCHITECT.

SIR,—Could any of your correspondents oblige me with a few particulars of an architect of the name of Edwards, who built Tehidy House, in Cornwall, for the Basset family, about the years 1734—1736? WALTER H. TREGELLAS.

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AT THE HORTICULTURAL EXHIBITION, ISLINGTON.

THE Agricultural Hall at Islington, which seems to have found a secondary mission as a shelter for an apparently interminable series of trade exhibitions,—some of them much better organised and more generally interesting than others,—is now extending its hospitality to the sister art of horticulture, and the Horticultural Exhibition and Market which was opened on Monday last, and which is to close on Saturday next, August 5, is not the least interesting of the recent displays in the hall, although neither so large nor (apparently) so energetically managed as might be desired. It contains some good things, and everybody who is fond of doing a little in the way of gardening and plant-rearing, even in murky London, may pick up some useful hints as to the best way of making his too often too small bit of ground, or his windows, bright with foliage and flowers. The exhibition is the first of its kind that has been held in the Agricultural Hall, and is, therefore, in some sense, an experiment.

Mr. W. H. Lascelles, of Bunhill-row, whose stand (C) occupies the centre of the hall, shows a convenient span-roof plant-house, fitted with a newly devised plant-stage formed of concrete slabs, 3 ft. by 2 ft., resting on iron bearers and placed close together, the outer edges being fitted with a neat red concrete kerbing. The exhibitor claims for this staging, and no doubt justly, much greater durability than that possessed by the wooden stagings ordinarily used; and he urges as a further recommendation in its favour that, being devoid of the interstices of the wooden stagings, the plants are not so likely to be injured by being over-heated, although means are taken for promoting the circulation of the warm air around the plants by placing the staging a few inches away from the windows of the house. The red pebble-pattern concrete tile floor here shown is cheap and admirably adapted for the floors of greenhouses and conservatories, as visitors can always walk over it dry-shod. The red concrete steps leading up into the conservatory should also be looked at. They have moulded nosings, so as to reduce the chances of chipping to a minimum, and durability is ensured by the embedding, in the top face of each step, of an ornamental cast-iron grille, the upper side of the iron being flush with the surface of the concrete which fills in the interstices of the grille. This combination of cast-iron and concrete presents the appearance of inlaid work, of which it may, indeed, be said to be a variety, and the effect is very good, while, of course, the durability of the step is largely increased. The locks and latches used in this conservatory are made entirely of brass, which, in the opinion of the exhibitor, is the only proper material to be used for conservatory door-fittings if they are intended to resist the effects of warmth and moisture. The walls of the plant-house exhibited are impermeable, being built of Potter's slabs filled in with concrete. Mr. Lascelles's new concrete lumps for garden rockwork, recently described in our columns, are shown, but as they are not built up it is not easy to judge of their effect. Possibly they may look all right when so arranged in conjunction with ferns or other plants. Mr. Lascelles has other things on view, but we must hasten on. Mr. James Perry, of Banbury (Stands 2 and 3), shows a large conservatory with side stages and simultaneous ventilating gear. At Stands 6 and 7, Messrs. W. & S. Deards, of Harlow, show their patent "Victoria" system of glazing, as applied to a large one-span-roof vinery. The Coalbrookdale Company occupy a large space (8, 9, 45, and 46) with some very excellent cast-iron work, including a very pleasant garden or summer house, a large fountain suitable for a park, several smaller fountains, and a variety of good vases and pedestals, flower-stands, garden-seats, &c. This company's work is characterised by remarkable smoothness of casting, and the designs are, in nearly all cases, well adapted to the purposes of the articles exhibited. At Stand 10, Messrs. F. Rosher & Co. have on view a large collection of vases, fountains, statuary, and other objects for the decoration of gardens, all executed in artificial stone; they also show a variety of garden border-edging tiles. At the next stand, Messrs. Messenger & Co., of Loughborough, show their "Loughborough" boiler, which possesses some good points, and, among other things, a new plant protector, the lower portions of which are made of slate or rough plate glass. Mr. J. Trotman (Stands 15, 16, and 17) is a large exhibitor of rustic arbours, summer-houses, garden-seats, &c. At Stand 18, Mr. James Keith, of Edinburgh and Arbroath, exhibits his patent "Challenge" and other boilers for hot-water heating, which deserve the attention of visitors. Messrs. Bailey, Pegg, & Co. (Stand 19) are exhibitors of a great variety of boilers, pipes, and other fittings for heating conservatories. At Stand 21, Mr. J. Matthews, of the Royal Pottery, Weston-super-Mare, has a good display of terra-catta vases, pedestals, fountains, and a variety of smaller requisites for the garden and greenhouse. Messrs. Grover & Co. (Limited) show, at Stand 23, the "Simplex" glazing, effected by means of lead strips, without putty. At Stands 27, 28, and 29, Messrs. Andrew Handyside & Co., of Derby, are large exhibitors of fountains, vases, garden-seats, &c., all in iron. At Stand 33, Messrs. Pulham & Son, of Broxbourne, are exhibitors of terra-cotta balustrades, vases, pedestals, and fountains; they also show their method of rock-work construction. At Stands 34, 39, Messrs. Deane & Co., of King William-street, have a good display of garden furniture, lawn-mowers, &c. Messrs. Piggott Bros., of Bishopsgate-street (Stands 36, 37), have a large display of very pleasant and useful marquees, garden tents, &c. At Stand 38, Messrs. Dick Radclyffe & Co., of Holborn, show some attractive window conservatories or plant cases. At Stand 49, Mr. James Lewis, of Stamford-hill, is an exhibitor of horticultural buildings, as are also Messrs. T. H. P. Dennis & Co., of Chelmsford, who (Stand 52) have some things well worth looking at. At Stand 78, Messrs. Ewart & Son show some good window conservatories; and at Stands 84 and 85, they have on view a variety of fern-cases, window-boxes, tiles, &c. At Stands 95, 96, and 97, Messrs. Wrinch & Sons, of Ipswich, show a conservatory, a summer-house, and a number of plant-frames. Messrs. Richardson & Co., of Darlington, have on view, at Stand 122, some good things, including an improved plant-frame. Messrs. Tracey & Son (Stand 127) exhibit their method of glazing without putty, while yet another means of effecting this (the "Eclipse") is shown by Mr. B. W. Warhurst, at Stands 158, 159; indeed, the number of ways in which inventors have sought, or are seeking, to dispense with putty is getting beyond computation. No plan of attaining the desired end is better established or more largely used than Messrs. Rendle's patent system shown at Stand 166. Messrs. W. T. Allen & Co. (Stand 161), are exhibitors of garden-seats, window conservatories, &c. At Stands 167, 168, the Thames Bank Iron Company are large exhibitors of good serviceable cast-iron tubular boilers, vertical and horizontal, together with saddle and conical boilers, piping, valves, connexions, and all requisities for heating horticultural and other buildings.

Having now made the round of the Exhibition, and pointed out some of the chief exhibits, we leave to our readers who may visit the Exhibition the task of finding out for themselves numerous other things of interest which we have not space to notice.

THE PROCEEDINGS OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE journal of "Proceedings" just now issued (No. 18) is particularly interesting, not to say important, and we wish to commend it to the attention of our readers. It includes the correspondence in the matter of the proposed improvements at Hyde Park Corner. A letter is printed from the Manchester Society of Architects, suggesting that the Council and officers of the Institute should be elected by ballot-papers, so that the country members and town members may have an equal voice in the election. This would be quite contrary to the *spirit* of the charter, even if the *letter* of it were met by the device. Beyond these, and even more important, will be found various communications presented to the Special Committee on Light and Air, and their preliminary report. These communications are from Mr. Whichcord, Mr. Arthur Cates, Mr. E. N. Clifton, Mr. J. J. Darley, Mr. W. G. Harrison, Q.C., Professor Hayter Lewis, Mr. Locock Webb, Q.C., and Mr. J. Leybourn Goddard, Barrister-at-Law, and ought to be read by every member of the profession, especially as this can be done at the cost of a shilling.

FOREIGN NOTES.

Discoveries at Epidauros.—An important discovery was made some time ago at Epidauros of the remains of a theatre, which holds the second rank as to size of the edifices of this kind in Greece, the record of which has come down to the present day. Its special excellence consisted, however (according to Pausanias), less in its size than in the completeness and harmony of the structure, which he considers as fitly illustrating the characteristics of its architect, Polyclete.

The Greek Archæological Society were fortunate in their explorations made last year on this spot, which has long been known to be rich in antiquarian treasures. Almost the whole of the auditorium and orchestra was traced, and from the details which have since appeared in an Athenian journal, there must have been accommodation for no less than 16,000 spectators in the theatre. The external periphery of the row of seats farthest from the stage is estimated as having been nearly 700 ft. There seems to have been a spacious gangway dividing the commoner places from those of a superior class. Traces of a promenade outside the exterior row of seats have likewise been discovered.

Cologne Cathedral.—The chief work which remained to be done after the building operations were completed in October, 1880, was the removal of the scaffolding then on the towers, which was more than 500 ft. in height, and contained about 44,000 running yards of wood. By the middle of May, 1882, the towers had been almost completely freed from scaffolding, and this difficult task had been carried out without any accident. There was a quantity of masonry work to be done in closing various openings, &c., which had been made in the walls for the purpose of hoisting up materials, &c. Much of this had to be done upon the removal of the main scaffolding. The immunity from accident to which allusion has been made is all the more remarkable when the dangers attending these finishing touches of the work are considered, most of this labour having been done by men suspended from above in hanging seats. There are still various matters in the interior which will occupy the present reduced staff of workmen for the remainder of this year. There has been a movement on foot for the acquisition of the houses which prevent the full extent of the building from being freely exposed, and for the lottery organised in connexion with the restoration being extended for a further period in order that the funds may be raised for the purchase of this property. If this idea is carried out, the plan of having the cathedral approaches laid out in the most suitable manner will be practicable, and thus the city will gain a material addition to its ornamental features. The designs (from Biblical subjects) for the stained-glass windows which it is proposed to place in the lower portions of both towers, are being prepared by Professor Klein, of Vienna.

The Restoration of Ulm Cathedral.—Some of the leading architects of Germany and Austria recently met to consider various proposals for the carrying out of this work. Their object was principally (according to the *Kölnische Zeitung*) to consider how to strengthen the foundations and certain portions of the masonry in such a way as to carry out in the restoration the plans of the original architect, Böblinger. The cathedral architect, Professor Beyer (whose opinion is founded upon the calculations of Professor Bauschinger, and upon his own observations) recommends in addition to certain masonry work, the use of iron for strengthening the tower, and giving it the needful solidity. There are to be models prepared before the work of restoration is earnestly taken in hand. The kingdom of Wurtemburg has contributed within late years four million marks (200,000*l.*) for the purposes of this restoration, but a donation from the Imperial German exchequer is also expected. The works in connexion with the tower will, it is expected, occupy at least three or four years. A view will be found in an earlier volume.

Excavations at Hamburg.—The works in connexion with the new Exchange at Hamburg have necessitated excavations to a depth of 21 ft. below the level of the Altenwall and the Adolfsplatz. Some time ago a mass of concrete 42 in. in depth was placed in this excavation, and having gradually hardened during last winter, building operations upon this foundation have since become practicable.

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The objects discovered during the progress of the above works have been of a specially interesting character, as the marine animals,—mussels, &c.,—discovered, go to prove that at one time the North Sea deposited its living denizens on the spot where the busy emporium of North German commerce now stands. Numerous remains of ancient walls have been found, some of them in a fair state of preservation, which throw light on some hitherto unsettled points in the municipal history of the city.

CONTINENTAL ARCHITECTURAL PUBLICATIONS.

RECENT improvements in various forms of illustrative art have done much to encourage the development of literary enterprise in connexion with architectural research. The range of this extensive subject has afforded ample scope for the efforts of those intelligent workers who have chosen particular subjects for their respective themes, and in many cases there has been contributed a sum of artistic information which enables the careful observer to grasp, without difficulty, many salient points affecting subjects of the highest interest. Thus, without any evident co-operation on the part of the various writers, our information on several important branches of art-history is more complete than might be supposed.

Capacity of observation, combined with clearness and precision of description, is, perhaps, one of the most striking features of Continental (more particularly German) artistic literature; and as no branch of art is more capable of gaining advantage from the lucid treatment of its history than architecture, a cursory glance at several recent foreign publications may not be unprofitable.

The capital of the Austrian Empire is known to contain many objects of interest to the student of architectural history, many of which are called to mind by the illustrated volume in course of publication at Vienna, in which Herr Neumann, jun., has (by means of photographs) reproduced such works as the portal of the Lichtenstein Palace, the vestibule and staircase of the palace of the Hungarian guard, &c. The former was executed by Luke von Hildebrand, and the latter by J. E. Fischer von Erlach. It is evident that the period during which these architects flourished was also fortunate as to artists skilled in plastic decoration. In the portions of the work already issued, the Geymüller Palace, and that of Prince Kinsky, have also been portrayed, as well as the portal of the Rathhaus in the Wipplinger Strasse.

The merits of the more recent school of Viennese architecture (which, in a great measure, owes its development to the important municipal improvements of late years) have been duly recorded in a work dealing with the private and public buildings of modern date in Vienna. In the latter category, the Opera-house and the Palace of Justice have been chosen for illustration in the first place. These two buildings afford an interesting contrast, the former being in the richly-developed style of the early French Renaissance, while the latter displays the more massive character of the German Renaissance Some of the leading architects of the capital have been assisting in the production of this important and valuable work; amongst them, Tischler, Von Lützow, Obermayer, Bültemeyer, and Ibrachowina.

Artistic enterprise has, however, not been confined in Vienna to the delineation of the features of interest within its own walls, but has furnished a contribution of general value to architectural literature in the shape of a work dealing with a number of interesting buildings in all parts of Europe. It includes representations of the Marini Palace at Milan, the Alcazar at Toledo, the Rathhaus at Augsburg, the Belvedere at Vienna, the Bevilacqua Palace at Verona, the gate of Salamanca University, the Campanile of San Giorgio at Verona, &c. The intention of the work is partly to disseminate, by means of photographic reproduction, such plans or representations as are only to be met with in rare works, and the more extended circulation of which would be of practical value to the profession.

Germany has lately done a good deal of service in the direction in which the Austrian technical world has been displaying commendable activity. In a volume entitled "Palace Architecture of Upper Italy and Tuscany, from the Fifteenth to the Seventeenth Century," Professor Reinhardt, of Stuttgart, has thrown light on an epoch of considerable artistic interest. The work on which Professor Nicolai of Dresden was engaged until his death, has been continued by Henmann. It deals with "The Ornamental Features of Italian Art during the Fifteenth Century," and serves to illustrate many points dealt with in Professor Reinhardt's work. The clearness of outline necessary for the efficient delineation of the delicate ornamentation of the period indicated has, it is remarked by a Berlin journal, been most successfully accomplished in the photographs accompanying the volume. These have been taken under the immediate direction of an architect of undoubted skill, whose opinion as to scale and position has evidently been of great assistance in the somewhat difficult task of reproducing such works as are contained in it.

The German Renaissance is, however, the period of artistic history which seems to have recently received most attention in that country. Amongst the most noted specimens of this epoch is the portal of the castle chapel at Dresden, which justly occupies a prominent place in Herr Fritsch's work, "Monuments of the German Renaissance." Various other objects of interest are depicted, such as the Castle of Aschaffenburg, the façade of the Salzhaus at Frankfürt-on-Main (with its curious wood-carving), &c. The Munich Renaissance has been treated as a separate topic by Herr Bauer, who has collected much interesting information on that subject.

In conclusion, there has to be recorded the volume due to the joint exertions of three Dresden architects,—Haenel, Adam, and Gurlitt,—which deals with the castles and family seats of the kingdom of Saxony. Though some buildings of modern date are illustrated, many of the ancestral castles depicted are of the period of the German Renaissance. The photographic representations of Kriebstein, Ehrenburg, Moritzburg, and other seats are spoken of as being particularly striking, the delineation of the Albrechtsburg, at Meissen, also doing full justice to the architectural features of that historical structure.

THE LARGEST LOCK IN THE WORLD.

It will be of interest to all those who either support or oppose the scheme for a ship canal to Manchester to know what is, at present, the largest lock in the world. In a statement recently submitted to the Congress of the United States this is said to be on the St. Mary's Falls Canal. "The canal is slightly over one mile in length. There are two locks to overcome the same elevation, one being the largest in the world. It is 515 ft. in length, 80 ft. wide, and 18 ft. lift." The estimated yearly expense of working it is 25,000 dollars. On the Louisville and Portland Canal, which is 2·15 miles long, are two locks 372 ft. long and 80 ft. wide, with 12 ft. and 14 ft. lifts. These locks were worked by hand in 1879; 3,168 vessels of all classes passed through the canal in that year. A tow-boat, a dock, and steam-dredges are maintained. The expenses for 1879 were 30,928 dollars, of which 14,453 dollars were for dredging. The North Sea Canal is stated in the same report to be sixteen miles in length, and from 130 ft. to 400 ft. in width. The level is below that of the sea. There are two sets of locks of large dimensions, and an artificial harbour constructed under great difficulties. The depth, originally 23 ft., is to be increased to 26 ft. by 1884. The cost of the work was 10,800,000 dollars. From November, 1877, to August, 1879, 4,862 vessels passed through the canal. The working expenses for the only year for which they have been obtained were 75,569 dollars. There are eight miles of canal to each lock-lift. On the Des Moines Canal, 7·6 miles long, there are three locks, suitable for the longest steamers on that river. The annual expenses are above 30,000 dollars, including a large amount for dredging. A detailed estimate of the number of minutes occupied in each of the eight operations involved in the process of going through one of these large locks amounts to 20½ minutes. At St. Mary's Falls the approaches are not completed, and cause material delays, yet lockages do not occupy half an hour each. The reporter concludes thus:—Probably, in almost every location where water is to be had, a better ship-canal can be made with a few locks, and at a far less cost than a sea-level canal. A small part of the money saved by the locks will, in most cases, make a broad and deep canal, where ships can go safely and rapidly, and pass each other anywhere without delay; instead of narrow deep cuts, commonly dangerous and always expensive, where ships must move slowly, and wait to pass each other. The question must be decided in each case whether the large amount required for the construction of a lock will save a larger amount some other way, and whether the delay at each lock will save a greater delay in some other way.

THE HISTORY OF ARCHITECTURAL DRAWING.

DID the Greeks and Romans, our masters in architecture, make drawings of the edifices they designed? Was the art of architectural drawing in existence among them? The question is one which we have no means of satisfactorily answering, but the researches of the most competent authorities make it clear that the ancients followed some different practice from the usage of modern architects in this matter. It can only be conjectured what their method was. It appears probable that drawing was not practised, and that instead of that it was the custom of the architect to make a model of each edifice he designed. The actual construction was carried out under the designer's own direction, he being present and himself prescribing every detail of the work, the measurements and the profile, to the operative masons and sculptors, and often executing portions of the work with his own hand. We have, however, proof that the art of drawing plans was not altogether unknown to the Romans. Paper, in the modern sense of the term, did not exist, but, in place of it, plates of marble were probably employed. The remains of at least one ancient sketch has, in fact, been preserved to us. We refer to the fragments of the plan of the ancient city of Rome, which are built into the wall upon the staircase of the Capitoline Museum, and to another tablet lately discovered. The age of these fragments cannot be placed later than the times of the Emperor Severus or Antoninus. The relics are, moreover, of value, as they make known to us the existence of certain buildings of which we otherwise have no trace. The next oldest relic of a similar kind which has come down to us is that of the Abbey of St. Gallen. This contains, on parchment, the drawing in simple lines of the normal plan of a monastery, with all the buildings belonging to it. The age of this document is certainly not later than the fifth or sixth century, and it was produced at the Court of the Frankish kings. After this, we find in the regulations of the lodges of Mediæval times certain strict directions enjoining upon builders the duty of exactly following the sketches of the edifices they are engaged upon. Another section prescribes that the rules for tracing and laying out of carved work, &c., are to be kept strictly secret. On the other hand, within the lodge, it is recommended that the fullest possible instruction should be imparted. By a very fortunate accident the old working drawings of the towers of the cathedrals of Cologne and Ulm have been preserved. They are believed to date from about the year 1350 A.D., and are now kept at Cologne. They were discovered by Herr Möller, who published facsimiles of them.

It is not before the age of the Renaissance that we have any architectural plans *in extenso*. Belonging to this period are the collection of hand-drawings in the Uffizi, at Florence. Lately, too, the architect, Von Geymüller, has published the plans of Bramante and Raffaelle for St. Peter's at Rome. These documents are mostly drawn with a pen in simple outlines on parchment or paper. From the sixteenth century the drawings which have come down to us are more frequent, and they are more complete in their style of representation.

With regard to the masters of the late Renaissance, we have a number of plans by Palladio and others. In the Museo Civico of Vicenza, Palladio's native city, there is a rich collection of his drawings preserved. They are on rough paper, and boldly drawn with the pen in sepia, and show a little shading. In the Church of St. Petronio at Bologna, at the end of the southern side aisle, there is a room with about thirty plans, by celebrated architects of the fifteenth to the seventeeth centuries, for

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a façade for that church. The style is mostly Gothic, a style which, however, was not understood by Peruzzi, Giulio Romano, and other masters of Late Renaissance. The non-Gothic drawings of Palladio and Alberti are better. Possibly there may be plenty of other old drawings scattered in different collections. In those mentioned, all that is attempted is the representation of the ground plan and façade. The style of representation is very simple, being only linear. The instruments and other aids to the draughtsman were, in the times we have spoken of, of a very limited and imperfect description.

It is only from the sixteenth century onwards, after the invention of printing and wood-engraving had rendered possible the publication of the works of Alberti, Vignola, and Palladio by Scamozzi and others, that complete architectural drawings date. It was only after the doctrine of projection had been worked out that architectural draughtsmanship was able to attain the perfection it presents in the present day.

THE BUILDERS' ACCIDENT INSURANCE (LIMITED).

THE first annual meeting of this company was held on Tuesday last at the offices, 27A, King-street, Covent-garden, Mr. Stanley G. Bird, the chairman of the Board of Directors, presiding.

The Secretary for the Southern District, Mr. E. S. Henshaw, read the following

REPORT OF THE DIRECTORS FOR THE YEAR ENDING MAY 31, 1882.

1. The directors, in presenting their first annual report and balance-sheet, consider that the result of the first year's business is a matter for congratulation.

2. It should be remembered that the company was founded to insure its members against what was mainly a new risk, of the extent of which no one had any accurate idea.

3. The directors therefore, with the benefit of the information and statistics placed at their disposal by the various Builders' Associations, and of the opinion of those whose judgment was entitled to respect, fixed at the outset a scale of premiums which they considered, and the result has shown to be, amply sufficient. It may, however, be stated that other companies, who commenced business after this company, appear to have accepted a similar basis of calculation, as they at first charged a similar rate of premium.

4. Whilst some companies have offered, and continue to offer, to take risks at rates lower than those originally charged, and lower than those hitherto charged by this company, the directors did not consider that it would be to the interest of the members of this company to make any alteration in the rate of premium for the first year; and it is obvious that many reasons which have weight with the directors of a trading company, who have to show a large business and earn a dividend for shareholders, have no application to a company such as this one, established on mutual principles, where the insured themselves alone participate in the profits of the business.

5. The directors, however, with the experience of one year's business, have now reduced the rate of premium by 25 per cent., and on all re-insurances during the current year they hope to be able to allow a further rebate equal to 10 per cent. upon the amount paid in premiums upon policies existing on the 31st day of May last.

6. In order to meet the objections entertained by some members to disclosing the amount paid weekly in wages, the directors have arranged to insure an aggregate sum paid in wages; but they would impress upon members intending to avail themselves of this method of insurance, the necessity of being careful to note when the amount covered by the insurance has been expended, as the policy then expires, and the Company has no right, until a claim under the policy is made, to inquire how much of the amount covered by it has been actually paid away.

7. Up to the present time the directors have issued 329 policies, insuring an aggregate amount of 2,500,000*l.* per annum paid in wages, and they have received 130 notices of accidents from policyholders, of which 15, estimated at 600*l.*, belong to the year ending 31st of May, and still remain for settlement.

8. From the annexed balance-sheet it will be observed that the preliminary expenses of forming the company amounted to 1,072*l.* 1s. 3d., which amount the directors propose to spread over a period of five years. After, therefore, debiting the present year with 214*l.* 8s. 2d., one-fifth of the preliminary expenses, and deducting the proportions of premiums upon current policies, attributable to the period subsequent to the 31st of May, there remains a balance of 2,704*l.* 13s. 4d. to the credit of the revenue account. This amount, however, is chargeable with the payment of the above-mentioned unsettled claims for compensation, for which the directors set apart 600*l.*, leaving, say, 2,100*l.* as a net profit; out of which it will be for the members in general meeting, as provided by the articles of association, to vote such a sum for the remuneration to the directors as they may determine.

9. It rests with the general meeting to decide what bonus should be declared, but the directors recommend that it should not exceed 10 per cent. upon the amount paid in premiums up to the 31st of May last. The balance remaining should be carried forward to the credit of the current year.

10. The auditors, Messrs. Bunkle & Clulee, retire under the articles of association, but are eligible for re-election, and their remuneration must be fixed by the general meeting.

The following statements of account were also submitted to the meeting:—

GENERAL REVENUE ACCOUNT,
May 31st, 1882.

Dr.	£. s. d.	£. s. d.
To Claim Register Account,—		
Compensation paid	329 1 3	
,, Preliminary Expenses, viz.:—		
Printing, advertising, postages, show-cards, travelling expenses, salaries, legal charges, and incidentals, 1,072*l.* 1s. 3d., to be extended over five years	214 8 2	
,, Working Expenses, viz.:—		
Advertising, printing, stationery, travelling expenses, postages, salaries, agents' commissions, rents, and incidentals	849 7 1	
,, Law charges, estimated	105 15 9	
,, Balance carried forward	2,704 13 4	
	£4,203 5 7	

Cr.	£. s. d.	£. s. d.
By total amount of premiums received from 1st of June, 1881, to 31st of May, 1882	5,863 9 3	
Deduct proportion for time unexpired on premiums running at 31st of May, 1882, as per register	1,695 14 4	
		4,167 14 11
By interest on investments		26 5 0
,, Bank interest		9 5 8
		£4,203 5 7
By balance brought forward		*£2,704 13 4

* *Note.*—This amount is subject to payment of the unsettled claims for compensation up to the 31st of May, 1882, estimated at 609*l.* 14s.

GENERAL BALANCE SHEET,
31st May, 1882.

Dr.	£ s. d.	£ s. d.
To Premium Account:—		
For proportion on policies running at 31st May, 1882		1,695 14 4
,, Creditors for claims ascertained, law charges, commissions, &c., and on general accounts outstanding		199 0 1
,, Balance revenue account		*2,704 13 4
		£4,599 7 9

* *Note.*—This amount is subject to payment of the unsettled claims for compensation up to the 31st May, 1882, estimated at £608 14s. 0d.

Cr.	£ s. d.	£ s. d.
By Investments:—		
Metropolitan Board of Works 3½ per Cent. Stock	2,111 17 6	
,, Dividends on do. outstanding	26 5 0	
		2,138 2 6
,, Preliminary expenses	1,072 1 3	
Deduct—		
One-fifth written off to Revenue Account	214 8 2	
		857 13 1
By Office Furniture		64 8 2
,, Balance at bankers' (South District)	621 5 10	
,, Petty cash in hands of Secretary (South District)	32 2 0	
		653 7 10
,, Balance at bankers' (North District) on Deposit Acct.	752 5 2	
,, Balance on Current Account	183 11 6	
		935 16 2
		£4,599 7 9

We have examined the foregoing accounts, with books and vouchers, and find the same correct.
(Signed)
BUNKLE & CLULEE, Chartered Accountants, Auditors,
Birmingham, July 12th, 1882.

London, July 25th, 1882.

The Chairman, in moving the adoption of the report and balance-sheet, said,—Gentlemen, you have heard the report and balance-sheet read; it is now my duty to propose that they be adopted, and in doing so it is necessary that I should make a few remarks upon them. I think we may look upon the report as a very satisfactory one, especially as it is our first. You will find that the amounts that have been paid for compensation have been remarkably small, but I think it is only fair to tell you that you must not count upon our being so lucky in the future, because each day, almost, brings forth something which tells us that we must not rely upon our claims being so few or small in amount as hitherto. We find that in all cases that are contested the sympathies of judges and juries go very strongly with the plaintiff. There is a very great deal of judge-made law on the subject, and we find that the construction put upon the Employers' Liability Act by the judges is very different indeed from that which we were assured would be its scope when it was before Parliament. As you will remember, the National Association of Master Builders, by whom this company was started, opposed the passing of the Employers' Liability Bill, on the ground that its provisions were open to too sweeping an interpretation, but we were assured by the late Attorney-General, Sir John Holker, and others, that the liability of employers would be limited as far as as possible. As it is, we now find that the liabilities of builders under the Act are very much greater than we believe is the intention of the Act, and instead of liability being limited to accidents arising from want of proper supervision and direction on the part of foremen, we now find that builders are liable for mistakes or carelessness on the part of men to whom they delegate no responsibility. For instance, the effect of some recent decisions is that if an accident happen in the course of his work to a bricklayer's labourer, the employer is liable, the bricklayer being regarded as a man in authority over his labourer. On this and other grounds, the chances of the company making large profits in the future are becoming more remote, although, at the same time, the effect of such decisions as those to which I have referred is to render it still more incumbent on the part of builders that they should insure themselves against losses arising from accidents. No doubt, some of you have seen it stated in the newspapers that Mr. Broadhurst and others are agitating for the amendment of the Employers' Liability Act, in the direction of greater stringency against employers. I think that if the subject comes before Parliament again this company ought to co-operate with the National Association of Master Builders, with the view of obtaining some amendment of the Act in the interest of the masters. In one or two contested cases in which this company has been concerned, we have suffered very great hardship from the fact that the plaintiff's solicitor would not pay the hearing fees when the case was appointed to be tried, and the consequence has been that the judge would not hear the case, although we were at the expense of putting in an appearance with solicitor, counsel, and witnesses,—an expense which was, of course, futile; and this is a hardship which would be more felt by individual builders whose cases were not in the hands of this company. If, therefore, the Act is to be brought under review by Parliament, I think we, on behalf of the master builders, should seek to get the Act amended so as to make it compulsory that in contested cases the costs of hearing should be guaranteed or paid before the case is heard. This may appear to be a small matter, but it really bears very materially upon the prosperity of this company, and, indeed, upon the prosperity of the building trade generally. Although we have great hope and good grounds for believing that this company will continue to be successful, we must not be confident that its success will be so great, or that the claims upon it will be so few, as they have been hitherto. You will notice in the fifth paragraph of the Report that we propose to give a rebate of 10 per cent. off all premiums paid last year by builders who re-insure with us this year, and this, in addition to the reduction of 25 per cent. which we have now made on all new premiums. We find that the business of the past year has been so profitable that we should be able to declare a bonus, which we think should not exceed 10 per cent. upon the amount paid in premiums. We hope that the reduction which we have made in the rate of premiums will bring us a large accession of new business, and that the further rebate which we propose will be the means of causing all our friends to re-insure with us. I may say that up to the present time we have only had an intimation from one builder who declines to re-insure with us. During the year we have had a great many notices of accidents,—no fewer than 130. With regard to forty-seven of these, the time for giving notice had expired. Some of the cases were very serious ones, one of them involving a claim of 200*l.* We have settled seventeen cases in committee, and our solicitors have settled two other cases. Of the claims

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unsettled on the 31st of May, four have since been settled. There are still claims pending amounting to about 230*l*. I have no more to say, gentlemen, but beg formally to move that the report and balance-sheet be adopted.

Mr. Howard Colls seconded the motion, which was carried unanimously.

Mr. A. Thorn moved that a sum of 500*l*. be appropriated to the remuneration of the directors.

Mr. D. Cross seconded the motion, which was unanimously agreed to.

The Chairman, on behalf of himself and his colleagues, thanked the meeting, and observed that the directors had met thirty-five times during the year, the individual attendances being 275 in London and 97 in Liverpool, making a total of 372. These attendances were entirely independent of the almost daily attendance of himself and some of the other directors; nor did the figures include the numerous attendances preliminary to the formation of the company.

With regard to the question of bonus,

Mr. Cross said that the chairman had, in allusion to the comparatively small amount of the claims on the company during the past year, very wisely laid stress on the undesirability of assuming that they would be able to depend on the continuance of such favourable results as had already attended their efforts. He, therefore, proposed "That there be no bonus declared this year, and that there be no rebate allowed on last year's premiums." He thought that the considerable reduction which had been made in the rate of premiums was as much as any reasonable man could expect. He thought that it was desirable to have as large a reserve fund as possible, for a large reserve fund would beget confidence in the ability of the company to meet exceptional demands upon its funds.

Mr. Harrison seconded this motion, which was supported by Mr. Holmes-Wood.

The Chairman explained that the directors had suggested a bonus of not more than 10 per cent. upon the amount paid in premiums, because they felt that it was only right that those who had insured with them when the success of the company was only problematical, and who had paid larger premiums than were paid by insurers in other companies which had been established since this one was founded, should have some return for their outlay and risk. The company, it should be remembered, was based on the mutual principle, and they would be quite within their rights if they divided the whole of their profits, year by year, as they made them. If a bonus of 10 per cent. were paid, in addition to the extra rebate of 10 per cent. on last year's premiums to re-insurers, there would still be carried to the reserve fund, out of the profits of the past year, and after allowing for directors' remuneration and all other expenses, a sum equal to 17 per cent. of the total amount received in premiums during the past year.

Mr. John Robson moved, as an amendment, "That the sum of 10 per cent. on the amount of the premiums paid last year be returned to insurers as a bonus." He contended that unless this was done, they would be breaking faith with their customers.

Mr. A. Thorn seconded the amendment, which was supported by Mr. Holmes-Wood, who withdrew his opposition to this part of the motion.

On the amendment being put, thirteen hands were held up for it and only two against it. It was therefore declared to be carried, and was subsequently unanimously adopted as a substantive motion.

The Chairman asked whether the meeting intended to instruct the directors to allow to re-insurers the rebate of 10 per cent. off all premiums paid by them last year.

Mr. Harrison said that as the meeting had decided to abandon the principle of having a very large reserve fund, it was obviously to the interest of the company to get and to keep as much business as possible. He therefore begged to move that the directors be recommended to return to re-insurers a rebate of 10 per cent. on the amount of their last year's premiums.

Mr. Cross seconded the motion, which was unanimously adopted.

On the motion of Mr. Holmes-Wood, seconded by Mr. A. Thorn, Messrs. Bunkle and Clulee were reappointed auditors, and their remuneration was fixed at twenty guineas, inclusive of travelling expenses.

Mr. F. J. Dove said that up to the present time they had not required the services of their referees (Mr. George Plucknett, J.P., and Mr. Thomas Clay), but at the request of the directors those gentlemen had attended several board meetings, for which he moved that thanks be tendered them, together with an honorarium of ten guineas each.

This having been seconded by Mr. W. J. Adamson, and unanimously carried, Mr. Plucknett thanked the meeting on behalf of himself and his colleague.

Mr. Harrison, in moving a vote of thanks to the Chairman for presiding, said he thought the building trade of the country was to be congratulated upon the formation and success of the company. No better form of co-operation than that which it exemplified could be conceived, and he was glad to be able to gather that the claims which had been made upon the company hitherto had been met in a liberal and not in a litigious spirit, so that they were not likely, he hoped, to get the reputation of being hard task-masters, but rather that of being a corporation willing to deal with cases with the same consideration which they would all desire to show in their several and individual capacities.

Mr. Holmes-Wood cordially seconded the motion, which was put and carried in due form, and the Chairman having returned thanks, the meeting terminated.

PROPOSED TUNNEL UNDER THE ELBE.

UNDER the river Elbe, at Hamburg, it has been proposed to build a tunnel to connect that city with an island a third of a mile distant. The great Hanseatic city, which has hitherto been a free port, is shortly to lose that privilege, and to be included in the Zollverein or German Customs Union. It is intended, however, to make an exception in favour of the island in question, which bears the name of Steinwärder, and to permit it to retain the privileges of the free port. Large bonded warehouses will be built there for the accommodation of merchandise before paying duty, and in order to bring the island into closer connexion with the city, the above-mentioned scheme for a tunnel under the river has been started. The tunnel would be 500 mètres or nearly a third of a mile in length. This will be upwards of 300 ft. longer than the Thames Tunnel. The cost of the Elbe Tunnel is estimated at about 900,000*l*.

THE VENDOME COLUMN.

A FAVOURITE amusement with visitors to Paris had long been the ascent of the Column of Vendôme, whence they obtained a splendid bird's-eye view of the great city. This pleasure the authorities have found it necessary to deprive travellers of in future. It appears that the practice of ascending to the gallery near the fine statue of Napoleon on this monument was resorted to not by sightseers only, but by a steadily increasing number of persons whose sole aim was suicide. Since the year 1850 no fewer than eighty-two visitors have thrown themselves from the top of the column and been dashed to pieces at its foot. The height from which they leaped is 140 ft. It was not found possible to prevent this terrible form of suicide except by totally prohibiting the public from ascending the monument, and this has accordingly been done.

ADULTERATION OF CEMENT.

THE above question is attracting a certain amount of attention in Germany at the present moment. One of the leading technical journals recently published (omitting names) an exact copy of a letter sent to a cement manufacturer offering him a supply of finely-sifted blast-furnace cinder for mixing with cement, and citing the fact that this article is regularly supplied to one of the largest manufacturers in Germany. The matter has recently been much discussed in technical and industrial circles, so that a considerable interest was taken in the meeting of the German Cement-makers' Union, which took place on the 6th inst. in Berlin. This assembly was convened, it would seem, for the express purpose of discussing the best means of putting a stop to such adulteration on the part of certain producers. The meeting was attended by representatives of nearly all the German cement-makers, and it is remarked that the deliberations were marked throughout by a friendly spirit, and by a desire to arrive at a solution of a definite and satisfactory nature. Dr. Dellbrück, the chairman of the Union, presided, and it was generally acknowledged that proceedings of the nature referred to on the part of certain manufacturers were calculated to injure the reputation of German cement in both home and foreign markets. It was further argued by some speakers that even if the admixture of certain substances with cement resulted in increasing its strength, yet it was unadvisable to sanction a practice which opened the door to adulteration of a more serious nature. A resolution was at length unanimously adopted to the effect that (leaving open the question whether the additions of certain substances to cement after burning improved or deteriorated its quality) all such admixtures should be considered as adulterations, and should be treated as such, unless the bags and casks bore a statement that such an admixture existed in their contents. Only such additions as gypsum, &c., necessary for giving certain properties to cement would be allowed, and then only up to the extent of 2 per cent.

The representatives of the factories which had used the admixture referred to then declared their intention of adhering in future to the principles laid down in the resolution which had been adopted. It was decided to forward to each cement manufacturer in Germany a copy of this resolution, with a request for an expression of the acceptance of the general principle thus laid down. It is proposed to publish, after a lapse of about three months, the names of those makers who shall have refused or neglected to signify their concurrence in the policy of the union.

A report is to be presented to the Government giving details of the steps which are being taken to prevent the continuance, on the part of manufacturers, of the adulteration which had called for the action of the central body.

"OWEN JONES" PRIZES, 1882.

THIS competition was instituted in 1878, by the Council of the Society of Arts, as trustees of the sum of 400*l*., presented to them by the Owen Jones Memorial Committee, being the balance of the subscription to that fund, upon trust to expend the interest thereof in prizes to "Students of the Schools of Art who, in annual competition, produce the best designs for Household Furniture, Carpets, Wall-papers, and Hangings, Damask, Chintzes, &c., regulated by the principles laid down by Owen Jones." The prizes are awarded on the results of the annual competition of the Science and Art Department.

Six prizes were offered for competition in the present year, each prize consisting of a bound copy of Owen Jones's "Principles of Design" and a bronze medal.

The following is a list of the successful candidates:—

1. Thomas E. Doran, School of Art, Macclesfield, Design for Silk Hangings.
2. James Meine, School of Art, Kidderminster, Design for an Axminster Carpet.
3. Thomas Linnell, School of Art, Leicester, Design for Tapestry Hangings.
4. Alexander Park, School of Art, Glasgow, Design for a Carpet.
5. John Sykes, School of Art, Leicester, Design for a Wall Paper.
6. Frank E. Adams, School of Art, Macclesfield, Design for Furniture Silk.

CONTRACTS WITH CORPORATIONS.

SIR,—It having been decided upon the statutes that contracts are not enforceable against municipal corporations, nor, in some cases, against Boards of Guardians, unless they are duly executed and sealed with the common seal of the Corporation or Board, it becomes an interesting question whether the reverse holds good, viz., whether a tender made by a person intending to contract with a Corporation or Board, duly submitted and accepted by mere resolution of such Corporation or Board, and properly entered on the minutes, but not sealed, is capable of being enforced, as a complete contract against the person making such tender. The opinions of your correspondents who write on the jurisprudence of building would be esteemed a favour by yours, H. A.

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OBITUARY.

MR. HENRY HILL, F.S.A., J.P., &c., who was buried in Kensall-green Cemetery on the 21st inst., had long been an occasional contributor to this journal. Under the signature "F.S.A." he, on many occasions, gave us flying accounts of the congresses held by the Royal Archæological Institute, and last year some comments of his on the procedure of the vergers at York led to a correspondence, both in our own pages and locally, which was productive of good in more places than one. Under the signature "CLARRY," he was a useful contributor to *Notes and Queries*. Mr. Henry Hill had been a member of an eminent firm of stockbrokers, Messrs. Hill, Fawcett, & Hill (Thackeray's "Dale, Spigot, & Dale"), but retired from it some years ago with a fortune. Being a popular member of the Masonic Lodge to which he belonged, of the "Cocked Hat Club," and similar social as well as intellectual bodies, a large number of friends met spontaneously, in addition to his relatives and those intimately connected with him in life, to see the last of one with whom many pleasant and not always uninstructive hours had been spent. His death was terribly sudden and wholly unexpected.

William Ellis, a well-known Yorkshire sculptor, was found dead in his bed at Sheffield, on the morning of the 19th inst. The day before he had visited the exhibition of pictures at the School of Art of the Sheffield Society of Artists, and appeared in his usual state of health. He had, however, been subject to fits of syncope, and it is supposed that he died whilst asleep. He was fifty-eight years of age, and an artist of great ability and talent. His marble busts have ever ranked high, whilst, as a young man, he was for years a valued assistant in the studios of several of our best known London sculptors. Unendowed with business tact, however, his life for some time past has been one of continuous poverty, a perpetual struggle with an empty purse and bare cupboard!

SALE OF HOUSES AND BUILDING LAND IN CAMBERWELL.

AN extensive sale of freehold houses and building land in Camberwell, which will occupy six days, was commenced last week at the Auction Mart, the sale being conducted by Mr. Robert Reid. The property, which is sold under an order of the Court of Chancery, comprises 700 houses situated in Albany-road, New Church-road, Camberwell-road, Camberwell-green, and other parts of Camberwell. It embraces several public buildings, including the South London Conference Hall, and the St. Giles's and Middle-Class Schools. Also ten licensed public-houses and the Camberwell Brewery. It was stated that the entire property produces a rental of 14,000*l.* per annum. In addition to the houses as above stated, the sale also includes thirteen large plots of building land, varying from 4,900 ft. to 19,000 ft. each, and covering altogether an area of upwards of thirty-two acres. The property is divided into 243 lots, and the portions disposed of at the first and second day's sale, last week, consisted of ninety-four houses and two plots of land in Albany-road. The large room at the Auction Mart, in which the sale took place, was much crowded throughout both days' sale. The auctioneer, before offering the several lots, observed that the rents of the houses were undoubtedly much below their real value, as was proved by the rentals of other properties in the same locality. This was owing to the owners having been satisfied with the rents which had been paid for several years past, and which had never been advanced, although they were about 30 per cent. below the average rentals of property in Camberwell. The sale then commenced, when from the activity in bidding it was soon proved that there was a great demand for the property. All the lots comprised in each day's sale were readily sold at what was considered full prices, being bought to pay from 6 to 7 per cent. on the outlay. One of the lots sold on the first day's sale, consisting of a licensed beer-house, known as the "Dun Cow," the rental of which is 30*l.* per annum, was sold for 900*l.* The value of building land in the neighbourhood of Albany-road was indicated by the price which was paid for two plots. One plot, consisting of 6,829 superficial feet, was sold for 710*l.*, being at the rate of 4,260*l.* an acre; and another plot, containing 11,737 ft., was disposed of for 1,160*l.*, being at the rate of about 4,500*l.* an acre. The first day's sale realised an aggregate sum of 23,615*l.*, and the second day's sale 18,025*l.* The sale will be continued and concluded next week.

VALUE OF CITY PROPERTY.

THE great value of property in the neighbourhood of the Bank of England was shown at a sale which took place at the Auction Mart on Tuesday, when an offer of 52,000*l.* was refused for freehold premises covering a ground-area of 2,623 superficial feet. Messrs. Debenham, Tewson, & Co., conducted the sale. The property consisted of Nos. 57 and 58, Threadneedle-street, containing the ground and four floors, having a frontage of 29 ft. to Threadneedle-street. It is now in the occupation of the General Post Office, on a lease for a term of sixty years from September, 1858, at a ground-rent of 1,000*l.* per annum, to which the purchaser would be entitled for the residue of the lease, which terminates in 1918, after which the particulars stated that he would receive the full rack-rental, moderately estimated at 5,000*l.* per annum. The property was described as forming the very centre of the most valuable part of the city. The biddings, commencing at 20,000*l.*, appeared to be confined to two gentlemen present, and were brought up to 52,100*l.*, when, there being no higher offer, the auctioneer withdrew the property at 52,200*l.*, stating that the sum which had been offered did not by any means reach the value which had been placed upon it.

THE NEW METAL EXCHANGE BUILDINGS.

AMONGST other new buildings in the City which have followed upon the reconstruction of Leadenhall Market, are the new Metal Exchange Buildings, which have just been erected in Whittington Avenue, Leadenhall-street, immediately adjoining the entrance to the market, and which were opened for the first time for business on Monday last, when the half-yearly meeting of the Metal Exchange Company was held in the principal room of the Exchange.

The building stands upon the site of Old Leadenhall, said to have been formerly occupied by Whittington. The principal elevation of the building, on the west side of the Avenue, is 51 ft. in length, the structure, including the numerous offices which it contains, extending to a depth of 128 ft., the rear of the building abutting on the west wall of the old City monastery. The Whittington Avenue frontage is 68 ft. in height, and contains four floors besides the basement. The ground-floor is carried up with polished red granite piers, on grey granite bases, with an ornamental arched entrance to the exchange-rooms, 9 ft. in width. The rest of the elevation is in Portland stone, elaborately carved and ornamented. The first floor contains a range of four three-light elliptical windows, together with a central projecting bay window, continued in the several upper floors to the top of the building, the central portion of the elevation above the cornice being surmounted by a pediment or gable. The second, third, and fourth floors have two-light windows, all the windows of the several floors being enriched and ornamented with carved and fluted pilasters.

The whole of the ground-floor of the building, to the extent of upwards of over one-half of its entire depth, is intended to be entirely devoted to the purposes of the Exchange. On the left hand side of the entrance, which leads into the exchange-rooms, is a waiting-room, with lavatories on the right-hand side. The exchange-room is 60 ft. in length and 38 ft. in width. The walls are panelled, the panels being divided by fluted pilasters, having carved capitals. In addition to a range of windows on the north side the Exchange is lighted by a handsome lantern light, extending almost the entire width of the apartment. The lantern light is surrounded by an ornamental cornice and carved ceiling, resting on fluted columns. Immediately adjoining the exchange or principal room, at the west end, is the reading and telegraph room, and also a spacious committee-room. The floors of the exchange and other rooms in connexion are all laid with oak. The whole of the ground and first floors of the building are fire-proof. The portions of the building apart from those used for exchange purpose contain fifty-two spacious offices, to which there are approaches in Whittington Avenue and also from Gracechurch-street, along a new thoroughfare to be called Leadenhall Avenue. All the offices have fresh-air inlets on the Tobin principle. The sanitary arrangements, which are ample and complete, have been carried out by Mr. George Jennings, of Lambeth; the gas-fittings are by Messrs. Strode & Co.; and the hot-water apparatus by Messrs. Bailey & Sons.

Messrs. Edmeston & Sons, of Old Broad-street, are the architects, and Mr. T. Boyce, of the Eagle Works, Hackney, is the builder. Mr. James Cornish is foreman of the works.

SALE OF AN EXTENSIVE BUILDING ESTATE AT CLAPHAM.

LAST week, Messrs. Debenham, Tewson, & Co. submitted for sale at the Auction Mart, the valuable building estate, known as West Side, Clapham Common. It was described as comprising a superior family mansion, with out-buildings, and extensive pleasure-grounds, together with nineteen acres of land. It was stated to possess exceptional advantages for building upon, possessing long frontages on three sides, one to Webb's-lane, being 1,648 ft. in length, another to Battersea Rise, of 506 ft., and a third fronting Clapham Common, 495 ft. The competition for the property was close. The first offer was 20,000*l.*, upon which advances were made in rapid succession, and the estate was ultimately sold for 45,000*l.*, being at the rate of about 2,400*l.* an acre. It was stated in the room that the property had been purchased by a syndicate, and that it will be immediately laid out for the erection of residences.

THE MEASUREMENT OF GLAZING.

KEYLOCK *v.* SPRULES.

THIS was a case arising from a question of measurement in glazing, heard in the Greenwich County Court on the 21st of July last, before Mr. J. Pitt Taylor. The plaintiff was Mr. Keylock, glazier, of 71, Evelyn-street, Deptford; the defendant, Mr. G. H. Sprules, Cannon-street.

Plaintiff had agreed to prime and glaze certain sashes at per foot, and had rendered defendant an account for doing the work amounting to 30*l.* 5s. 2d. Defendant had paid him 30*l.* 7s. 7d., and also 1*l.* 10s. as an allowance for priming, in settlement, claiming to be justified in paying for glass supplied only; but plaintiff demurred to this, and now sued for balance, 4*l.* 7s. 7s.

Mr. Laidman, who appeared for the plaintiff, asserted that it was a universal custom in the trade to charge priming and glazing sashes to the full outside dimensions of sash, instead of size between rebates, and that his client had pursued this system of measurement successfully for twenty years, to which the judge replied that, if so, it was because he (the plaintiff) had never been found out.

Mr. Wallbutton, builder, of Lewisham High-road, New Cross, who represented the defendant, stated that he had had a long and practical experience the other way, and endorsed this by referring the judge to a standard trade price-book, and handed in a glazing account for work by a London firm, showing that the present system was to charge the size of the squares, but in fractional parts of inches to allow the glazier the full inch; that by the way the plaintiff measured a difference was made against the defendant of about 300 ft.; that full allowance had been made, and 1*l.* 10s. paid for priming, although priming was agreed to be included in the price quoted by the plaintiff; and was about to call one of his witnesses; when,—

The judge ruled that it was a clear case of overcharge, and gave verdict for the defendant, with costs of four witnesses.

The Safety of Cairo.—Five well-known artists, Messrs. Carl Haag, Frank Dillon, Walter Severn, R. M. Chevalier, and R. Dowling, make an appeal on behalf of Cairo. They say,—"We who, while painting the streets of the old town, the stately mosques, and unrivalled tombs of the Caliphs, have almost become worshippers of the beauty of the place, positively shudder to think that these splendid specimens of Oriental architecture may in a few days be heaps of ruins. The Government may have good reasons for following a particular policy, but we venture to think that nothing,—no political considerations,—can justify the delay which is taking place in providing for the safety of Cairo."

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BUILDERS' BENEVOLENT INSTITUTION.

THE thirty-fifth annual meeting of this Institution was held at Willis's Rooms, St. James's, on Thursday, Mr. George Plucknett, J.P., in the chair.

The annual report stated that, notwithstanding the augmentation of the yearly payments to the pensioners, a larger number of annuitants now receive the benefits of the Institution than at any previous time have been dependent on the funds of the charity. The labours of the Committee were encouraged by an offer from Mr. George Godwin (who had promoted the welfare of the Institution from its commencement) that if twenty other persons would give ten guineas each he would give a further donation of a hundred guineas. That offer was taken up by Mr. George Burt, J.P., the president of the Institution for the past year, with the generous spirit in which it was made, and through Mr. Burt's energy and liberality the project was most successfully achieved. The Committee were thereby enabled to increase the number of pensioners on the books of the Institution. The committee point out that, in consequence of the death of many gentlemen who had for many years been subscribers to the Institution, it is important that its friends should enlist new subscribers, so that the annual income may be maintained in such a way as to enable it to meet the increased expenditure consequent on the augmentation of the pensions. Among the good friends of the Institution who had died during the past year were Mr. J. Simpson, Mr. J. M. Macey, Mr. George Jennings, and Mr. T. F. Odell. By Mr. Simpson's death the Committee had lost a colleague who took an earnest interest in the charity. The annual ball, thanks to the energy of the gentlemen who acted as stewards, had resulted in a profit to the funds of the Institution of 68*l.* 15s. 6d. During the past year eight pensioners had been elected (seven men and one woman), and five pensioners (three men and two women) had died. In conclusion, the report stated that Mr. J. T. Chappell had consented to become President of the Institution for the ensuing year, and that the annual dinner would be held at the Freemasons' Tavern on November 2 next.

The balance-sheet, duly certified by the auditors (Messrs. J. H. Hunter, J. Cruttenden, and R. J. Ward), shows that a balance of 1,349*l.* 15s. 4d. was brought forward from last year; that the annual subscriptions amounted to 806*l.* 18s. 6d., and the donations to 1,453*l.* 10s. 6d.; that 643*l.* 2s. 8d. was received in dividends on 21,438*l.* Stock; making a total, with interest on deposit account and profit on ball, of 4,347*l.* 3s. 9d. The total expenditure amounted to 2,158*l.* 19s. 8d., including 1,779. 9s. 6d. paid to pensioners, 15*l.* burial money, and 364*l.* 10s. 2d. expenses of management. There remained a balance at bankers of 2,188*l.* 4s. 1d., 1,250*l.* of which was on deposit, and 938*l.* 4s. 1d. on drawing account.

On the motion of the Chairman, seconded by Mr. Thomas Stirling, the report and balance-sheet were unanimously adopted, Mr. Stirling observing that the position of the Institution was very satisfactory, the income being larger than last year, while the expenditure was less.

Votes of thanks were passed to the President for the past year, and to the Vice-Presidents, Trustees, Treasurer, and Auditors, and it was unanimously resolved that Mr. J. T. Chappell be elected President for the coming year.

THE PROPOSED NEW PUBLIC OFFICES

A COMPETITION CONTEMPLATED.

IN the House of Commons on Monday last, in reply to questions put by Lord Elcho and Mr. Aylmer,

Mr. Shaw-Lefevre said now that the new scheme for the War Office and Admiralty had been adopted by Parliament, the property acquired in Parliament-street would not be required. That property had been purchased for 240,000*l.* He was informed that it had been bought on most reasonable terms, and that by acquiring that property from the Government at cost price, and by purchasing the remaining land required, Parliament-street could be widened by a public body without loss. He trusted that the work would be undertaken by the Metropolitan Board of Works, but in the event of their not doing it, he was in hopes that it could be done by some other means.

Lord Elcho understood that there was to be an architectural competition in respect of the War Office and Admiralty. He wished to know whether it was intended that it should be a limited or an open competition. He would strongly urge upon the Government to make it an open competition.

Mr. Shaw-Lefevre said that he had not yet decided what form the competition for the new buildings should take. Some of the best architects declined to compete if it were an open competition, on the ground of the great expense of preparing designs. He was told, however, that it would be possible to adopt a plan of having a double competition; first, sketch designs, and then a selection of five or six of the best for the complete design. The matter was not yet decided.

THE "BLACKSMITH'S ART," AND TECHNICAL EDUCATION.

SIR,—I read with very great pleasure Mr. G. H. Birch's paper as reported in the *Builder*. But during a long experience in the trade, I have yet to learn that there is any truth in one remark made by him, that, "Happily for our times, we do now appreciate the smith's art." It may be true that there are many passive admirers of such work, but the real patrons and virtual connoisseurs of the art are very few and isolated indeed, and beyond a few well-known firms, who find a limited amount of employment, there is little demand for genuine art-smith work. The demand is for those cheap and nasty abortions that vainly attempt to simulate good art, and so we have bad and flimsy imitations of old specimens, formed of sheet-iron, tin-plate, wire, and round rods, bent, and stuck together with clumsy rivets, lead, solder, and even cement and putty, in a rickety and wretched fashion, subversive of all art, instead of genuine forged and welded work, drawn out and tapered in due proportion, beaten up and curled in bold relief, curved in elegant scrolls, and bent in graceful, free, and ever-varying contour, all neatly yet strongly welded, dovetailed, and riveted together in such masterly manner as marks at once the cunning hand of the artist, and every part of the work in accord, complementing and relieving each other without either confusion or monotony, and embodying the very love and fervour of the true-souled craftsman, who wrought his poems in iron, even as others have written theirs with the pen.

But for such work there is no demand. The true art-smith is not desired. No one wants such an ornamental dreamer in this sordid, profit-grinding, and most mechanical age. Why, sir, the whole country is full of shams; and every mart is selling its "art productions" at from a farthing per pound or a penny per yard.

The art wanted is that of a long-winded, strong-limbed biped,—a human machine, that turns out its work like corn from a mill. "I want," said an employer, "a fellow strong in body and weak in brain." Quantity is the desideratum, not quality. Or, if the art-smith be employed, sir, is it not to dab together in some slippy and slop-shop manner the Cheap-Jack barbarisms of some frenzied or idiotic fellow who imagines that he alone is an apostle of art? Mr. Birch speaks as an architect, I infer, with little knowledge and no experience of the practical art-workers who have literally begged from door to door for employment, only to meet with contemptuous rebuff and insolent sneer, as well as disappointment and denial. During the twenty years that I have been connected with the business, as workman, foreman, manager, and designer, I have met with many such, and know of many who, meeting with no demand for their art, have left it by compulsion for other branches of trade. I write of honest, steady, and able men, who were capable of working out almost anything in metal. The men that there is a demand for are men of mediocrity, who do not excel the capacity of their incompetent superiors, and drudges who work out in silent obedience the absurd designs given to them, without either suggestion, hope, or ambition other than servile submission to the whims of his masters, who, in their own default, are ever ready to blame the "British workman." From time to time we have an outcry of the great lack of intelligent and able workmen; and now there is quite a mania for technical education, just as years ago there was a similar outcry, when the science and art classes in connexion with the South Kensington Departments and the Society of Arts competitions for art-workmen were instituted. How is it? Have these schemes failed? Where are the thousands of workmen and students that have attended these classes, with their prizes and certificates? Why! no master cares for them; no one looks at them; no one hears of them; and they are of no value to the holder! The schemes were most laudable, and well calculated to effect their purpose; and I, with others, am deeply grateful for the good information and teaching there received, as well as the hunger for more that it created, as in the immortal Oliver. But how is this loud clamour again and again about the incompetent and unintelligent workman? These schemes have failed, just as the present scheme for technical education will probably fail, not through the default of the workman, who receives no encouragement or demand for superior intelligence or ability. The default is that of the employers and their clients, who neither patronise nor encourage high-class workmen. The client patronises the biggest pennyworth, ignoring the fact that the value is in inverse proportion, and the employer acts on the same rule. The managers and foremen are selected either for their plausibility, good penmanship and good address, or for their driving and bullying powers, and not for their practical ability or technical qualifications; and both masters and foremen, deficient themselves, are not only incapable of judging of the merits of things that they cannot understand, but also dread the really intelligent, well-educated, and able workman, who is better qualified than themselves in every point but in the matter of capital, position, and opportunity. Workmen are not slow to detect this, and others reason,—"What is the use of my going, like Brown, and wasting my time in studying and money in books? He is no better off for it, and gets no more pay than I do"; and, sir, *cui bono?* Educate the workman, indeed! No, sir; educate the masters.

These reformers begin at the wrong end. What we want is that the employers and their customers and consumers or purchasers be educated to that point at which they shall be able to distinguish between good work and botch-work, and between shams and meritorious art; or until they will tolerate good men. Create a demand for them, and encourage them, and they will soon be forthcoming. When you find a man of ability, however poor, or whoever he may be, if honest and of good character, instead of greeting him in your usual, "Can any good thing come out of Nazareth" way, test him! Do not ask if he is an R.A. or an F.R.S., or if he has had a university education! For these are by no means guarantees of universal qualification. Do not inquire if he is a member of a noble family,—holds a commission in the army,—or possesses testimonials from lords and legislators, and innumerable clergymen; nor require him to be a distinguished foreigner; but seek to know if he can do the work he professes to do, and if so, try him!—and by so doing you will soon discover more intelligence and refinement in British workmen than you give them credit for!

And so with his compeer the able designer and draughtsman, who has devoted long years of study and experience to the mastery of his art, who, instead of mere copyism and purloined designs, evolves from his own ingenious mind creations, novel, original, and beautiful. Too often in poverty and painful obscurity, he is neither encouraged nor required. His position is occupied by some boy draughtsman who can trace or copy designs filched from other catalogues; or else some poor bungler, at a similar rate, who, selecting portions of this design, and bits of another design, of various styles, jumbles them all together in inconsistent and incongruous ornament,—a sort of metal patch-work or hotch-potch of odds and ends of such sort as any man of taste or honesty would be ashamed of. The qualifications and superior ability of the honest artist are repudiated, and should he by any means get employ, it is only for a short time, until a few good designs are made, to which his employer generously signs his own name, and so, not only robs the man of all due credit for his work, but, by so doing, prevents the real designer from becoming known and obtaining other chances of employment. And the pay, sir! I have known such a clever artist to be offered the munificent reward of 25s. per week. Encouraging, is it not? Very! "Happily for our times, we do now appreciate the smith's art" Again, the poor artist applies for a vacant situation, and submits examples of designs, which are retained, although he obtains not the situation. Years after he discovers that they have adopted and published the submitted designs, without giving either pay or credit for them. There are thieves abroad, Mr. Editor; but this is a kind of theft that the law excuses.

AN OLD ART-WORKMAN.

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THE LATE MR. G. SOMERS CLARKE.

SIR,—As an old pupil of the late Mr. George Somers Clarke, whose loss we must all deplore, I may perhaps be permitted to add my testimony of respect to his memory.

Mr. Clarke was an architect of great power and culture, singularly unaffected, and possessed of considerable industry. His urbanity and kind consideration to those in his office were marked characteristics. To you, Sir, all who were associated with Mr. Clarke must feel grateful for the considerate and gentle nature of your remarks in reference to our late friend.

I was closely associated with Mr. Clarke from the year 1854 until 1862, and during this period he entirely rebuilt Cowley Manor, Gloucestershire, for the late J. M. Hutchinson, esq., of Lothbury, and also designed the singularly beautiful Italian garden, with terraces, waterfalls, pavilions, and termini, &c., belonging to the same. The style adopted was pure Italian. Mr. Clarke subsequently designed a small Turkish bath, which was attached to the mansion, which was of a very perfect character, and about the same time he carried out a large warehouse in Wood-street for Messrs. Munt & Brown. He also designed the Merchant Seamen's Orphan Asylum at Snaresbrook, together with the chapel, the gift of Lady Morrison. These works contain much evidence of his perfect acquaintance with Italian Gothic detail, and were the outcome of much study both as to planning and design. About the same time he designed the Brighton Asylum and Schools, which also bear evidence of his intimate acquaintance with a style of which they form graceful examples.

The Turkish Baths in Jermyn-street was an important work of novel character, and I recollect how much careful study he gave to this work, the style adopted being one in which Mr. Clarke had previously little acquaintance, and also to the great industry he exercised in making himself acquainted with the Turkish and Moresque styles of architecture, together with the Roman mode of arranging the various apartments and hypocaustum. This bath is second to none in correct design and excellence of arrangement. Mr. Clarke, in carrying out the details of the building, was greatly assisted by the late Mr. David Urquhart, of Turkish celebrity, the late Mr. George Wilt, the late Mr. Erskine Rollond, and Mr. Thudicum, all of whom possessed experience in the arrangement of such establishments. Mr. Clarke used to send me to attend the Institute library in order to consult the works of Gérault de Prangey, and other writers whose names I seem now to have forgotten, so that the architectural details of the building should be perfect. It seems but yesterday that I met in this bath the late Mr. E. M. Barry, only a short time before his sudden and lamented decease, and in the conversation we had together he expressed himself greatly pleased with the arrangements and design of this unique work.

In your notice of his works you omit to mention the building he designed for the London Printing and Publishing Company in St. John's-street-road, since pulled down for the purposes of the Metropolitan Railway. This was a work of much merit, designed in the German Gothic style, and I think was illustrated in your journal. Mr. Clarke also altered the Haymarket Theatre for the late Mr. Buckstone; he also prepared in competition designs for the Banstead Asylum, which, though unsuccessful, were marked by much originality of design and careful planning.

As a surveyor, Mr. Clarke was not wanting in acumen and judgment, but it is as an architect and artist that he will be best remembered. He was a great sketcher, and almost invariably used the camera lucida. His touch was singularly delicate, which is the more remarkable when we recollect that he had lost the first joint of the thumb of the right hand by a gun accident.

EDWARD POWER.

Brindley & Co.—We observe in our advertisement columns that the old-established firm of Joseph Brindley & Co., slate merchants, have opened an office and show-rooms at 61, King William-street, City. This firm, which has been established in London for sixty-two years, was lately turned into a private company, under the Limited Liability Act, and are now largely extending their business.

THE LATE HABLOT BROWNE.

SIR,—I do not know whether any one has hitherto remarked that the late Hablot Browne, the "Phiz" of many of Dickens's and other authors' works, was originally an architectural artist.

On looking through the plates of Winkles's "Cathedrals" (notably the illustrations of Canterbury Cathedral), the name of "Hablot Browne" will be found as the draughtsman of several of the engravings.

As architectural drawings they are not especially striking, and in many instances they are incorrect, but possibly they belong to an early period of his career, and before he found that figure-drawing was his speciality rather than architecture.

Winkles's work was, I believe, first issued in monthly numbers, somewhere about the year 1836 or 1837.

FRANCIS T. DOLLMAN.

COMMUNICATIONS BETWEEN NORTH AND SOUTH OF THE THAMES, EAST OF LONDON BRIDGE.

SIR,—I shall be glad if you will give me space for a few words on the above subject. I have read your recent excellent article, but there is one point which does not seem to be sufficiently looked at by Mr. Barlow, and that is, that all the communications shall be free. What the Committee for improved communications want is that whatever shape such communications assume, whether tunnels or ferries, they shall be absolutely free, both to foot-passengers and every class of vehicle. All the schemes heretofore have been subject to heavy tolls, hence their apparent failure. An Act was passed in 1872 for a common ferry from Greenwich to the Isle of Dogs for the passage and conveyance of horses, carriages, cattle, goods, wares, merchandise, &c. Some of us remember the cumbrous boat that was provided, which lay rotting for years on the foreshore at Greenwich. No wonder the public did not use it, as the scale of tolls for vehicles named in the said Act are as follow:—For every two-wheeled chaise or other carriage of like nature, drawn by one horse, the sum of 6s.! For every wagon, whether drawn by three or four horses, the sum of 10s.!

That further modes of communication are needed, any one interested in the subject would see if he would stand a short time near King William's Monument, London Bridge, and note for himself the traffic going east and that going west; he would not need to be told that for the enormous trade of the East of London additional means of communication are requisite; moreover, it seems anomalous that the 2,324,000 people west of the Monument require for their traffic no less than twelve free bridges, whereas, on the other hand, for the 1,509,000 inhabitants eastward of the Monument (to which we should add the 296,290 of West Ham) there is for their carts, vans, carriages, &c., only the one mode of crossing the water, viz., by London Bridge. It is contended by Mr. Barlow and others that they do not require increased modes of communication. The statement refutes itself.

The merchants and traders of the East End of London urge that their trade is crippled, and that they suffer very much for the want of free communication other than the long and tedious route *viâ* London Bridge.

SAMUEL TRICKETT,
Treasurer to the Committee.

LOCAL BOARD SURVEYORS.

SIR,—The enclosed cutting from the *Wolverhampton Evening Express* of Monday, July 15, shows a far from solitary instance of what is done by the Local Board surveyors in this district,—a practice which is increasing, and might be stopped by members of the Boards refusing to sanction such proceedings. It is all very well for a man to draw a good salary for his, in many cases, light municipal duties, and then to follow a private practice either openly or through his assistants: thus enabling him to work at one half, or even less, of the usual commission, and by such means, together with ensuring the passing of the plans, taking the work from the hands of local practitioners and ratepayers; but, as the solicitor in the case observed to the judge, "It was a disgraceful practice, and the sooner it was abandoned the better," in which the judge appears to have concurred, by giving a verdict against the surveyor.

It is to be hoped that Local Boards will take care to prevent such doings, and in the meantime a few words from the *Builder* would make known the impropriety of such conduct.

A PROVINCIAL ARCHITECT.

THE PERQUISITES OF A LOCAL BOARD SURVEYOR.—At the Oldbury County Court, before Mr. W. D. Griffiths (judge), Joseph Davis, surveyor to the Oldbury Local Board, brought an action to recover the sum of 15*l.* 10s., balance of commission for superintending the erection of two houses and stabling in Titford-road, on behalf of Messrs. John & Cornelius Bagnall, ironmasters, Langley. Mr. Wright (Messrs. Wright & Co.) appeared for the plaintiff, and Mr. Shakespeare represented the defendants. The houses were erected in 1875, and the plaintiff alleged that he was employed by the defendants to draw the plans and superintend the erection of the buildings at a commission of 2½ per cent. He received 10*l.* on account during the building, and the claim was for the remainder of the amount. In cross-examination, the plaintiff stated that as surveyor to the Local Board he only inspected a building after the foundation had been made, and then again when the building was finished. He had 170*l.* per year as surveyor to the Local Board. Plaintiff said he prepared the plans in this case, and on his advising the Board they were passed. That was in the year 1875. The Judge said it would have been odd if the plan had been rejected. Mr. Wright said he thought it was a very wise arrangement. The Judge said it was, for persons who were going to build, because they would be sure to get their plans passed. It might be very good for them, but it was not for the Local Board. Mr. Shakespeare said the system of a surveyor advising the Board to pass plans that he himself had prepared was one very much to be deplored. It was a disgraceful practice, and the sooner it was abandoned the better. He was surprised that the Local Board should allow such a state of things to exist. For the defence, it was contended that the plaintiff refused to superintend the building after it was one floor high. The Judge said he was inclined to think the plaintiff's case had failed; he should accordingly give a verdict for the defendants.

VARIORUM.

THE "Draper's Dictionary" (Collingridge), by S. William Beck, is an attempt to give particulars relating to the history of textile fabrics in a handy and convenient form, and to clothe the statements with the literature of the subject. Although it is for the most part compiled from compilers, it is a useful book, and moreover a pleasant.——The *Sunday Review* for July (Trübner) includes a full report of the last annual meeting of the Sunday Society, and of the debate in the House of Commons on the proposed extension of Sunday opening.——A writer in "Our Homes and How to make them Healthy," for August, speaks thus as to parsonages:—"In discussing the arrangements of an ordinary country parsonage, it is necessary to bear in mind the special circumstances which distinguish this class of house from other houses of similar dimensions. The principal distinctive feature about a parsonage is, that it is inhabited by a succession of owners whose circumstances may be, and frequently are, widely different. While the amount of the income of the living remains fixed within certain limits, the actual income possessed by any one occupant may, on the one hand, be restricted to that amount, or, on the other hand, it may be considerably greater by reason of private means possessed by the incumbent. The tenure also of a parsonage is peculiar. It, together with the glebe, belongs to the incumbent absolutely so long as his incumbency lasts. While, however, the incumbent's tenure is freehold so long as it endures, he (or his executor), is liable to his successor to deliver up the building at the determination of his incumbency in a perfect state, without allowance even for wear and tear. The effect of this system makes the incumbent at once both tenant and landlord. The necessity, therefore, for building parsonages in the most substantial manner possible is obvious. Another no less important consideration involved by the peculiar circumstances of the holding, is that the size and character of the house must always bear a due proportion to the value of the living. In building or altering a parsonage, regard must always be had, not to the special circumstances or requirements of any one particular incumbent, but to the reasonable requirements of an incumbent solely dependent on the income belonging to the living. It will readily be

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understood that if this rule were not strictly observed, a rich incumbent of a poor benefice might burden his successors with a house costly in maintenance and repairs, and quite beyond their means to keep up. Again, an unmarried incumbent might build a house in every way suitable to his own requirements as a bachelor, but utterly inadequate for the accommodation of a married parson with a young and numerous family."—— We get from *Cassell's Illustrated Universal History*, for August, a brief account of the foundation of Alexandria:—"Entering Egypt at Pelusium, Alexander found his fleet already there. The Egyptians crowded to welcome him, and, leaving a garrison in the city, he marched across the desert to Memphis. Here the satrap Mazakes immediately surrendered himself, and an immense treasure came into the hands of Alexander. The whole of Egypt, indeed, submitted with alacrity, as a relief from the insulting despotism of the Persians. The Macedonian hero rested himself for some time in this ancient and magnificent city, offering sacrifices to the god Apis and other Egyptian deities, and entertaining the people with gymnastics and musical performances. He then sailed down the western branch of the Nile to Canopus, situated at its mouth. Seeing the advisability of removing the seat of government from Memphis to some spot upon the coast which would be more within his power, he determined to found a new metropolis on the shores of the Mediterranean. Hence arose the famous city of Alexandria, afterwards one of the most splendid and important capitals of the world,—the great seat of commerce for Europe, Africa, and India, and an intellectual centre of the Greek race, which for several ages exercised a powerful influence over the philosophy and religion of the civilised world. Alexander himself marked out the circuit of the walls, the direction of the principal streets, and the sites of numerous temples, which were to be dedicated to Grecian and Egyptian deities. The site was on a narrow tongue of land stretching between Lake Mareotis and the sea, and the plan of the city was made to include the adjacent isle of Pharos, which was joined to the other part by a causeway. Two harbours were formed,—one on each side of this causeway,—for ships coming by sea; and Lake Mareotis was utilised for the reception of exportable produce from the interior. The nucleus of the population was mainly derived from the neighbouring town of Canopus. During the rule of the Ptolemies, Alexandria grew immensely in size, in grandeur, in population, and in wealth. Its Museum was celebrated in all civilised lands, and the Library of Alexandria (the destruction of which has been the subject of contradictory statements) contained the finest collection of Greek classics in the world. In this most interesting city, the East and West may be said to have mingled as in a common centre; and from the consequent interchange of ideas between the more ancient and the more youthful communities of the world, Christianity itself received some of those elements which rank among the philosophical influences of a later epoch."

Miscellanea.

Palestine Exploration Fund.—Captain Conder, R.E., last week addressed a large party assembled by invitation of Mrs. Grear, of Grove House, Regent's Park, on the researches and discoveries recently made by him in the expedition from which he has just returned. The chair was taken by Col. Warren, C.M.G., R.E., who explained the difficulties encountered in the progress of the work, and the resolution with which Captain Conder had met them. The points of principal interest were,—first, the rude stone monuments discovered in Moab, of which Captain Conder found no fewer than 700, many of them bearing distinct traces of having been used as altars of sacrifice or libation; among them may be, in fact, no other than the altars of Balak. At Ammân he found a monument which he suggests may be the bedstead of Og, being a great cromlech on a hill close to the city. The second point on which he dwelt at length was his great discovery at Kadesh, the sacred capital of the Hittites This discovery was made from the description of its conquest by Rameses II. The Bishop of Huron, who was present, spoke strongly on the importance of these explorations, as to which we not long ago offered some comments.

The Law Courts, New and Old.—In Committee of Ways and Means on Monday evening, the House of Commons proceeded to consider the Civil Service Estimates. On the vote to complete the sum of 117,200*l.* for the new Courts of Justice, &c., Sir R. Cross inquired when it was proposed that the new Courts should be opened. Mr. Shaw-Lefevre said some delay had been caused by the death of Mr. Street, the architect. He hoped, however, that the buildings would be thoroughly completed, and that the judges would be able to enter upon their duties in them, on the first day of term after the Long Vacation. Mr. Sclater-Booth hoped the right hon. gentleman would be able to give some assurance to the Committee that the present law courts in Westminster Hall would be pulled down. Mr. Shaw-Lefevre had not yet consulted the Government on this matter, but hoped that the course indicated by his right hon. friend would be pursued. There was a certain obligation to the public that the old Courts should be pulled down so that the exterior of Westminster Hall might be seen. What the general effect would be was at present a matter of doubt. He believed Sir Charles Barry was of opinion that the general architectural effect would not be altogether satisfactory, and that he had contemplated another wing of the Houses of Parliament, but in regard to this no decision had been arrived at. The vote was agreed to.

A Window for New Zealand.—A very handsome stained-glass window, which is about to be sent to New Zealand for the music warehouse of Messrs. Milner & Thompson, of Christ Church, New Zealand, has been on view in the show-rooms of Messrs. Heaton, Butler, & Bayne, of Garrick-street, London, who have designed and executed the work. The window consists of a large circular-headed centre panel and two side panels. In the centre are two figures representing the lyric muse, Euterpe, and the god Apollo with the golden lyre. In the upper portion of the same window are medallions, supported by Cupids holding a scroll, with the legend, "From heavenly harmony this universal frame began." The names of eminent musicians are introduced into the side windows. This glass is of special interest, inasmuch as it is the first specimen of high-class work that has been sent to this colony. The window will be exported by Messrs. H. Cohn & Co., of London Wall.

Messrs. Chubb & Son, the patent lock and safe makers, are about to transfer their lockmaking factory from Wolverhampton, as we have already mentioned, to the large Patent Safe Works built by them, a few years ago, in Glengall-road, Old Kent-road, London; but they want a little further explanation. At the London works they have room for 1,000 workmen, and already possess extensive boiler and engine power, together with a quantity of powerful machinery. They propose to add special machines for making certain parts of their locks, leaving the more complicated and delicate work to be done, as now, by hand. Messrs. Chubb have made about one million locks and many thousands of safes since commencing business, sixty-four years ago. The average length of time each workman (including boys) has been in their employ is seventeen years. Messrs. Chubb are evidently good masters.

A Parochial Experiment in Dusting and Cleansing.—The Works Committee of the Clerkenwell Vestry have made a report of the operations and results of their staff doing the dusting, watering, &c., of the parish during the past year, from which it appears that the total cost amounted to 5,460*l.* 10s. 10d., the receipts to 1,295*l.* 1s. 5d., making the cost for the year 4,165*l.* 9s. 5d. This sum is stated to be only 220*l.* above the average of the previous six years, and the committee remark that this slightly increased cost is more than compensated by the greatly increased efficiency with which the work is performed by their own staff.

Prizes for Good Plumbing.—On Monday, the 17th, the prizes awarded for success in the recent public competition for practical plumbing, instituted by the National Health Society, and carried out at South Kensington, were presented at a meeting of the Society. To Mr. Geo. Taylor, Duke of Westminster prize, 5*l.*; to Mr. John Wise, National Health Society's prize, 5*l.*; to Mr. George William Hamblin, second prize of 3*l.* The competition followed on the series of lectures given by Mr. S. Hellyer, at the Society of Arts. The prizes were awarded on the adjudication of Mr. George Shaw.

London and Middlesex Archæological Society.—By permission of the rector and churchwardens of St. Olave's, Hart-street, a general meeting of the Society will be held in the church, on this Saturday, the 29th, at half-past two p.m., when the following Papers will be read:—"On the History and Antiquities of St. Olave's," by the Rev. A. Povah, M.A.; "The Worthies connected with the Church," by Mr. Henry B. Wheatley, F.S.A. The Society will next proceed to view (by the courtesy of the Vicar, Canon Thomas, M.A., and the churchwardens) the Church of All Hallows, Barking. An account of the building will be given by the Rev. J. Maskell, M.A.

Mr. Ruskin's Sheffield Museum.—Mr. Ruskin met the Mayor of Sheffield and a number of influential gentlemen last week, to discuss the question of enlarging St. George's Museum. This museum is situated at Walkley, a suburb of the town. Its contents, all of which belong to Mr. Ruskin, are so numerous, and the house is so small, that only a comparatively small portion can be exhibited. It is now proposed to erect a large and suitable building by subscription. If this be done, Mr. Ruskin expressed his willingness to put the museum on a legal basis, so as to insure its permanence to the town, and said he hoped to devote much of his time to making the museum the most perfect of its kind in the world.

TENDERS

For second portion Gloucestershire Second County Lunatic Asylum, Barnwood, near Gloucester. Messrs. John Giles & Gough, architects. Quantities by Mr. C. H. Goode:—

Drew, Chalford	£40,212	0	0
Bowers & Co., Hereford	38,380	0	0
Davies, Cardiff	38,050	0	0
Smith, Birmingham	38,002	0	0
Barnsley & Sons, Birmingham	37,800	0	0
Horsman & Co., Wolverhampton	36,890	0	0
Sanders, Southampton	36,868	0	0
Lovatt, Wolverhampton	36,645	0	0

Accepted for the Fulwood and Whittingham waterworks. Mr. John James Myres, C.E., 15, Chapel-street, Preston, Lancashire. Quantities by the engineer:—

Contract No. 1, Storage Reservoir.

Robert Simpson	£8,026	13	2

Contract No. 2, Conduits.

Robert Simpson	£775	13	2

Contract No. 3, Iron Pipes.

W. Allsup & Sons	£6,598	0	0

Contract No. 4, Laying Iron Pipes.

Walmsley & Co.	£1,885	0	0

Contract No. 5, Service Reservoir.

James Jemson	£2,120	18	5

Contract No. 6, Buildings.

Battersby Bros.	£1,107	6	0

Contract No. 7, Compensation Reserve.

Robert Simpson	£1,136	19	2

For building new Board School in Oxford-gardens, Notting-hill, for the London School Board. Mr. E. R. Robson, architect:—

Oldrey	£10,992	0	0
Higgs	10,325	0	0
Lawrence	10,199	0	0
Nightingale	9,981	0	0
Outhwaite	9,797	0	0
Pritchard	9,700	0	0
Stimpson & Co.	9,485	0	0
C. Wall	9,440	0	0
Atherton & Co.	9,400	0	0

For additions and alterations to residence, North-hill, Highgate, for Mr. Roger Gaskell. Mr. Stephen Box, architect. Quantities by Messrs. Walker Bros.:—

Lawrence	£1,441	0	0
Wall Bros.	1,385	0	0
Smith & Son	1,249	0	0
Holmes & Sons	1,197	0	0

For the erection of a detached house, with stable, in the St. Nicholas-road, Upper Tooting, for Mr. W. S. Bidlake. Mr. H. Wakeford, architect:—

Williams, Balham-hill	£1,650	0	0
Smith & Son, Warwick-street	1,395	0	0
W. Johnson, Wandsworth-common*	1,371	0	0

* Accepted.

For taking down and rebuilding 34, Castle-street East, and premises in the rear, for Mr. R. L. Cripps. Mr. A. E. Hughes, architect:—

Falkner	£2,787	0	0
Cooper	2,579	0	0
Burningham & Co.	2,327	0	0
Cheffins*	1,980	0	0

* Less 60*l.* for old materials.

For shop-front at York Town, Surrey, exclusive of plate glass, for Mr. H. Savage. Mr. F. G. Norry, architect:—

Allcock (accepted)	£275	0	0

For alterations and additions to National Schools, Camberley, Surrey, for Rev. F. M. Middleton. Mr. Francis T. Dollman, architect. Quantities by Mr. T. W. Davis:—

Allcock	£634	10	0
Watson	550	0	0

Accepted for new store and warehouse, Booth, Luddenden:—

Roland Gaukroger, Mount Tabor (masons' work).
J. & S. Murgatroyd, Luddenden (carpenter and joiners' work).
Jonas Alderson, Luddenden Foot (plumber and glaziers' work).
G. & T. Alderson, Luddenden (slater and plasterers' work).

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For the erection of new schools (to accommodate 1,400 children) at Nunhead-passage, Lambeth division, for the School Board for London. Mr. E. R. Robson, architect. Quantities prepared by Mr. T. T. Green :—

Scrivener & Co.	£16,388	0	0
Hart	16,146	0	0
Shepherd	15,896	0	0
Nightingale	15,569	0	0
Higgs & Hill	15,484	0	0
Oldrey	15,442	0	0
Maraland	15,361	0	0
Peto Bros.	15,318	0	0
Downs	15,279	0	0
Tongue	14,900	0	0
Jerrard	14,743	0	0
Kirk & Randall	14,735	0	0
Perry & Co.	14,595	0	0
Wall	14,180	0	0

For the new infirmary, Canterbury. Mr. Cowell, architect :—

Jones, Gloucester	£3,690	0	0
Stiff	3,675	0	0
Cornelius	3,649	0	0
W. Cosens	3,474	0	0
J. Cosens	3,466	0	0
E. Hatton	3,428	0	0
Denne Bros.	3,385	0	0
Adcock	3,363	0	0
G. H. Denne	3,300	0	0
Bourne	3,290	0	0
Wallis & Co., Maidstone	3,278	0	0
Wise	3,200	0	0
Gaskin (accepted)	3,146	15	0

For repairs, &c., at No. 7, Coleherne-road, Kensington, or Mr. Bushell. Mr. H. I. Newton, architect :—

R. & H. Pickersgill	£115	0	0
Wood	95	0	0
Simpson (accepted)	89	0	0

For the erection of the first portion of Emmanuel Church, Hornsey-road. Messrs. Frederic R. Farrow & E. Swinfen Harris, architects. Quantities by Mr. Clement Dowling :—

G. H. & A. Bywaters	£4,985	0	0
Dove Bros.	4,575	0	0
Williams & Son	4,310	0	0
L. H. & R. Roberts	4,237	0	0
Lathey Bros.	4,235	0	0
Boyce	4,220	0	0
Hook	4,042	0	0
Gaisford	3,993	0	0
Taylor & Grist	3,918	0	0

For Waterhead Board schools, Oldham, exclusive of foundations and retaining-wall, which are in progress by schedule. Mr. Thomas Mitchell, architect :—

S. Ashton & Sons, Oldham	£5,737	0	0
W. Lees & Sons, Oldham	5,334	0	0
T. & W. Meadows, Stockport	5,319	0	0
C. Schofield & Co., Oldham	5,300	0	0
W. A. Peters & Sons, Rochdale	5,235	0	0
Jackson & Randall, Oldham	5,158	0	0
Dysons & Sons, Oldham	5,027	0	0
Holmes & Webster, Ashton	4,668	0	0
Cabinet Company, Oldham*	4,586	0	0

* Accepted.

For the erection of Bryn-heilog, Forest-hill, for Mr. W. P. Appleton. Mr. Herbert D. Appleton, 364, Wool Exchange, architect. Quantities supplied by Mr. F. T. W. Miller, 6, Guildhall-chambers :—

Patman & Fotheringham	£3,943	0	0
H. & R. Roberts	3,794	0	0
W. Smith	3,779	0	0
Colls & Sons	3,663	0	0
Clarke & Bracey	3,592	0	0
Merritt & Ashby	3,553	0	0
Nightingale	3,587	0	0
Howard & Dorrell, 28 and 29, Russell-street, Covent-garden (accepted)	3,383	0	0

For building a cottage at Mile-end, Colchester. Mr. W. Scargill, architect :—

Garwood	£200	0	0
Gladwell	180	10	0
Dupont (accepted)	177	0	0

For pulling down and rebuilding 108, Union-road, Rotherhithe, for Mr. Brodie. Messrs. Snooke & Stock, architects. Quantities by Messrs. Linsdell & Giffard :—

Priestley	£700	0	0
Smith	697	0	0
Everett	670	0	0
Pritchard	656	0	0
Wells	655	0	0
Eldridge & Gee (accepted)	645	0	0

For the erection of shops and houses in the High-street, Peckham. Mr. E. George Wyatt, architect. Quantities by Messrs. Quilter & Hardcastle :—

Nightingale	£13,430	0	0
Merritt & Ashby	12,223	0	0
Hook	12,050	0	0
Shepherd	11,980	0	0
Bentley	11,686	0	0
Wall	11,060	0	0
Gibbs & Flew	10,500	0	0

For painting, &c., Angler's-gardens School, for the London School Board :—

Boyce	£263	0	0
McCormick	191	0	0
Grover	190	0	0
Dearing & Son (accepted)	183	16	0

For building dwarf wall, with railing, at Hornsey-rise, for the Islington Vestry :—

Porter	£145	0	0
Cave	131	0	0
Toop	115	0	0
Powell	113	12	6
Quirk	100	0	0
Dearing & Son (accepted)	97	10	0

For the erection of a residence and making road to same at Datchet, Bucks, for Mr. William Shipley. Mr. A. A. Hudson, architect :—
Joseph Higgs, Upper Park-place, London (accepted).

TO CORRESPONDENTS.

H. K. R. (136 ft. 3 in.).—G. M. H. & Co.—W. A.—E. & G.—G. G. H.—Lord E.—D. & Son.—C. H. G.—W. S.—H. H.—J. H.—B. & Co.—W. J.—S. & Co.—W. Bros.—V. & B.—M. J. A.—R. M. P.—S. C.—S.—M.—A. C. P.—G. H. T.—C. & Son.—J. J. W.—R. W.—J. H.—U. & Co.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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VOL. XLIII. No. 2061. SATURDAY, AUGUST 5, 1882.

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The Working Man's Home Question again and the Railways.

FEW things tend more directly to oppose the progress of improvements in fine, and even more notably in mechanical, art, than the common idea of the natural opposition between theory and practice. That the two differ, of course, no one denies. But the point to bear in mind is, that they differ as do two constituent parts of one machine, in the absence of either of which the remaining action, though not quite arrested, is wasteful and imperfect. When a man is spoken of as a man of theory, the fact may be that he is a bookish man: as such the field in which he can do most service to his plans is that of abstract work. Put a De Morgan to drive a locomotive, and he will probably drive his train to a smash. Ask the most experienced engine-driver to solve an elementary mathematical question as to the proportions of his engine, and he will be simply dumbfounded. But if it should happen that the great mathematician should not only speak with contempt of the ignorance of the wary and experienced driver, but should further proceed to instruct him as to the way to drive a train, the result would be as unfortunate as if the driver were to say, "You may be all very well in your study, professor, but you know nothing practical about engine-driving, and I think it a waste of time to listen to anything that you may say about the steam-engine." It is obvious that by taking either of these courses true progress is hindered. It is by the outcome of careful experience, under the control of science, that the best results are to be attained. But they will no more be obtained by the latter apart from the former, than by the former apart from the latter.

It is, however, a marked feature of the English character to show impatience of this scientific control. The "unreadiness" which has been of old laid at our door is a result. When we came out of the Crimean War we were fitter to conduct such an operation than when we went into it. We had been beaten into form. This shows extraordinary pith and pluck of character. But it is a great waste of national resources.

This want of scientific control has been signally illustrated by the proceedings of two Parliamentary Committees during the past week. Matters which, we do not hesitate to say, any competent man who, like Robert Stephenson and Isambard Brunel, gained his experience by practice under the guidance of science, could determine on sound principles, have been fiercely debated, and compromised on terms that only ensure the renewal of the struggle. One of these relates to the important social and building question of the provision of workmen's trains on the North Kent line. We have before now called attention to the cardinal element which railway communication forms in the distribution of house accommodation. Here is an instance that presses for settlement. The claim that, if a railway company occupies for its stations the site of the former homes of many of the industrial classes, it ought in some way to repair the injustice by affording them transport on the line on favourable terms, is one of which the justice is palpable. What is required for a fair discussion of the subject? Just this; to know exactly the cost of such transport. It will then be comparatively easy to determine the amount of net profit upon it (taking into account the interest of capital specially laid out for that end), that the company should receive or should waive. Has this been ever attempted? On the contrary, the decision has been handed over to the Board of Trade, which is entirely without the requisite *data* on which to come to any conclusion on the subject. And, to mark still more forcibly the unpractical character of the compromise, it is to hold for two years! Where will the workman be, either during the two years of suspense, or when the whole matter would be fought over again, at the end of the term of truce?

If we deserve in any way the commendation of a Manchester writer, as "a journal well known for its clear and trenchant articles on questions affecting transit," it is mainly for the following reasons. First, we regard the whole question of transit as one of supreme importance. It vitally affects the welfare of the productive classes. As regards the trades connected with building, it has the double importance, first, of affecting the price of materials and of labour, by the cost of transport, both of goods and of passengers; secondly, of affecting the distribution of building in various localities. Therefore, the subject demands profound study. Then, it is certain that there are mechanical rules that determine the *maxima* and *minima* of cost, of speed, and of convenience of arrangement. No sound views can be arrived at without these rules are clearly ascertained. Thirdly, comes the practical question of the wants of any particular locality, or class of men. These last questions are not to be settled by the scientific writer, but by the practical and experienced manager. But they will be only guessed at by him, unless he is first provided, by the man of science, with those economic limits within which he must work, as to which practice alone can tell him little or nothing.

Without attempting more than an indication of the rough limits within which such a discussion must be confined, we would point out, first, that a load of third-class passengers, full in number, regular in time, loading and unloading itself, and walking away from the station, each man, moreover, provided with an annual ticket, so that he makes no demand on the time of the ticket-takers, is at once the cheapest and most remunerative load that a railway can carry. A third-class carriage, nine yards long, will contain fifty passengers, and weigh, with them, 11 tons 14 cwt. The percentage of paying load to gross load is 28·7 per cent., a little more than one quarter. A mineral wagon, six yards long, will carry, on the average, if quite full, 8 tons of coal, which, with the weight of the wagon itself, makes 12 tons 9 cwt. This gives a percentage of 64·26 paying load to 100 gross load. But the mineral wagon has almost invariably to return empty. This alters the proportion to 47 per cent. paying load, and, in fact, the average of the wagons of the great trunk lines gives 44 per cent. paying load of coal out of 100 tons gross load. Equal weights of train, then, will carry 28·7 tons or hundredweights of passengers, and 44 tons or hundredweights of coal. So that if the ton of coal is carried for ½d., the ton of passengers (subject to certain minor corrections into which we will not now enter) can be carried for ¾d.; which comes to one-twentieth of a penny per mile per passenger. We do not assert that this is the actual cost, but the figures are approximately reliable.

On the other hand, it is left too much out of sight how great is the cost of stoppages. On the Metropolitan Railway it has been calculated that the cost of propelling a train from Moorgate-street to Praed-street, a distance of four miles, with seven intermediate sudden halts, is as much as would take the same train without a stop for more than five times the distance. Thus if, on the one hand, it be inferred, from the low mineral tariff, that the workman can be carried in full trains for 1-20th of a penny per mile, the mere fact of interposing seven stations in four miles to pick up or to drop the men as convenient, brings up the cost to upwards of a penny. This, however, is a statement in excess, as it is not the whole cost of transport that is increased by the stoppages; but mainly the two items of locomotion and wear and tear of way, which make together 40 per cent. of total cost. At all events, the 20th of a penny, which would be applicable over a long and unbroken run, is raised to nearly one halfpenny by the numerous stoppages.

It must not be supposed that we are now attempting to lay down the law, and to say that such and such is the exact cost of the conveyance of such a load of passengers. We have taken, for instance, every seat as filled. In point of fact, there are usually three empty seats out of four provided. The economy of the workmen's trains mainly lies in their being full. But we wish to point out how questions of this kind come under the control of distinct

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mechanical laws, at which it is possible to arrive with precision, and that in ignorance of such laws, any discussion of the cost at which the North Kent Company can be justly expected to carry workmen is little more than puerile.

This view of the case is remarkably illustrated by the long delay and frequent divisions, turned often by a casting vote, of the Select Committee of the House of Commons on railway rates and fares. Very unfortunately, more than one prominent railway director sits on that Committee; a fact that tends to deprive the report, whatever it may be, of the character (at all events, in the general public esteem,) of impartiality. Nor will much weight attach to the decision of a majority of one or two out of twenty-three members. But it is hardly to be credited that during the sittings of this Committee in 1881 (which fill a Blue Book of 800 pages, besides a supplement of 350 more) but one engineer has been examined, and that to this gentleman, who appeared on behalf of a canal company, not a single engineering question was put by the Committee.

Not only is that so, but the evidence of the railway managers, so far as it goes, was directed to the positive discrediting of that scientific control to which the managers of foreign railways attach, properly, so much importance. Mr. Rendel's analysis of the working charges of the Indian railways was produced by a member of the Committee, who cited the testimony of Mr. Crawford, the chairman of the East India Railway Company, as to the practical improvements that had been introduced in the working of their line, owing to "the method which the companies now had of ascertaining the exact cost of doing every item of the work." The manager of the Great Western Railway only regards that as "a curious calculation, but I do not see how it would enable you either to get more profit, or to reduce your expenses, or to increase your trade." The manager of the London and North-Western Railway disdained any knowledge of Indian railways, thinking that "there is no fair comparison to be drawn between Indian and English railways." So far does this gentleman carry his view as to the inutility of the comparative study as to the working of railways, that he actually stated the net returns on the French railways at 4, instead of 5½, per cent. on capital. In the same way, he says about American railways:—"I know nothing about them specifically." Thus, so far from eliciting that clear, scientific evidence, in the light of which the vexed problems as to terminals, preference rates, and the other matters discussed by the Committee, would almost settle themselves, the teaching of the evidence is to discourage that scientific knowledge, and thus further to perplex a question which, if dealt with in the manner that a true comprehension of its character would indicate, is by no means one of great complexity.

In saying this we do not for a moment undervalue the immense amount of detail which presses on the attention of the railway managers, and with which nothing short of immense practical experience will allow any one to deal. We cannot but admit the practical impossibility of setting forth, *à priori* and in a book, the details of those rates and charges which the managers tell us amount to *millions*. But it is one thing to give to the practical man full rule and discrimination as to practical details, and another to furnish him with those scientific and mathematical data within the limits of which all profitable work must lie. "It clearly cannot be in the interest of the public that a railway company is to be compelled to do a certain portion of its work at a loss, and therefore to handicap the other traders with a higher charge in order to make up that loss." By the alteration of one word, in this very just remark, the witness, Mr. Grierson, would at once make himself the spokesman of the great body of railway freighters. He should only say, "allowed," instead of "compelled," and we are altogether at one with him. But how does this fit with the statements by the same witness, "I know, speaking for myself, that we are carrying some of the traffic for Mr. Taylor at rates which do not more than pay our working expenses." "I think it is clearly to the interest of the public that they," the railways, "should compete with the sea." "We must either charge a competitive rate with the sea traffic, or give up the traffic altogether." This is said in explanation of a charge from London to Exeter of 33s. 4d., and of a charge for the same class of goods, of 24s. 2d. from London to Plymouth, which is fifty miles further.

For very much of the comfort of life in this country we are indebted to the engineers who designed, and carried out, our railways; to the bold traders who advanced the capital; to the careful managers who direct the details. At the same time, it cannot be contended that the administration is incapable of improvement. The rates of fare and freight we are now paying are from 14 to 16 per cent. higher than is the case in France, and France is on the point of a great reduction. In punctuality, and even in safety, there is great room for improvement. On the other hand, the remuneration enjoyed by the shareholders is wretchedly low,—only 4¼ per cent.,—against 5½ per cent. on the cheaper-rated railways of France. And connected with this is a general discontent, on the part of the principal freighters, as to irregular charges. It may well be the case, as is argued by some who have watched the railway system from its cradle, and analysed the returns not only of English but of foreign railways, that it is possible at once to content the freighters and to improve the property of the shareholders. That may be too good to be true, but, at all events, it is a statement which, backed as it is, demands adequate investigation. What we lament is, that when inquiry is instituted into a part of the subject, as in the case of the North Kent Bill, and of the Railway Rates Committee, sound judgment should not even be attempted. A party fight, *pro* or *con.*, freely takes place in Committee. Men of the special science that must determine the question of profit and loss, in the last resort, are not even asked to appear before the Committee, or, in the rare exceptional cases, are not asked any scientific questions. We have abundant evidence, more especially from the manufacturing parts of England, that this mode of dealing with the complaints of the freighters will not satisfy the country.

Since this was in type, the Committee on Railway Rates have agreed on their Report. We have not time to analyse it to-day, but as far as the six recommendations which are reported in the daily press go, they seem to be fair and reasonable. But we have the means of knowing that the independent members of the Committee are disappointed with the result of their labours.

THE BOOLAK MUSEUM.

LITTLE did we suspect when some few weeks since we spoke of the scheme which had been determined on to explore the Delta of the Nile,* that the march of political events would render any such undertaking impossible, perhaps for many years to come; and now it seems that it is not alone the further researches of the archæologist that will by recent events be arrested. The collections of a generation of diligent antiquaries are threatened, if not with absolute destruction, with the scarcely better fate of dispersion. The announcement has gone the round of the artistic world that it is the intention of Arabi Pasha to dispose of the Boolak Museum. Stories have reached us of the courageous conduct of the director, M. Maspero (who succeeded, it will be remembered, the late lamented Mariette Bey), and who, in the midst of the utmost danger, has, captain-like, refused to abandon his ship. All who are aware of the exceptional value of the contents of the museum must have trembled to hear of the imminent danger which the collected treasures of twenty years' toil are at present running. Coupled with the threatened fate of that storehouse of Arabic art, the city of Cairo, the dispersion of the Boolak Museum, which has revealed so many secrets of the unknown past, adds only a further horror to the many that have accompanied the recent outbreak in Egypt. Should such a thing occur at Cairo, nothing can replace its treasures of architecture and decorative art, as delicate as any that flourished contemporaneously with our exquisite Gothic. Some knowledge of the pecuniary value of the contents of the Boolak Museum promises, it would appear, to prove the safety of the collection, and in this hope we must thankfully trust.

The story of the formation of the Boolak Museum affords in itself a not unrepresentative chapter of modern Egyptian history; the indifference and apathy with which the collection has at all times been regarded by the natives, by the late Khedive Ismail Pasha himself,—without whose aid, however, it is frankly admitted the museum could never have been formed,—are only too characteristic of the nation among which the late lamented Mariette Bey passed so many years of his life in the organisation of the museum which remains a monument that will do more to honour his memory than even the costly statue which, within a few days past, has been unveiled in his native town of Boulogne. The museum, installed in a series of warehouses, is far from being lodged in a suitable manner. Ismail Pasha had, it would appear, originally intended that it should be sumptuously housed, and many thousands of francs,—bondholders' francs, we suppose,—were expended some years ago in the erection of a house for the museum; a mass of ruined walls, lying on the road from Cairo to the Pyramids, is the sole result of this expenditure. In its present quarters the museum is, it appears, in dangerous proximity to the Nile, and had not recent changes been made with a view to raising the floor-level, the annual inundations of the Nile could not have failed in time to have seriously injured the collection. As it is, the objects are much affected by the prevailing dampness. There seems, however, a certain fitness in the situation of the museum, the Nile floating majestically by, as it has done century after century, with its river life the same that the Egyptians of the days of the Pharoahs and the Israelites saw. Those who have visited the spot all agree in speaking in unmeasured terms of the beauty of the situation of the museum, pleasantly removed from the bustle, the noise, and the luxury of Cairo, the city of the Thousand-and-One Nights.

It is the especial feature of the Boolak Museum that it differs materially in its character from every other museum of Egyptian antiquities. It is a museum organised specially with a view to aid the study of Egyptology.* The mode in which the collection was formed gives it this special character. Apart from a small gathering purchased by Said Pasha, it is entirely the result of the excavations conducted during twenty years past under the direction of the late Mariette Bey. The European museums, as every one knows, have mostly been formed in a far from consecutive manner. The Boolak Museum, on the other hand, is the result of a series of researches made on a regularly organised plan, directed by one man, and that man Mariette Bey. Of each period of history the museum contains all the information which research has been able to gather. In his invaluable catalogue, Mariette Bey has shown how the greater part of the European museums have been formed by the purchase of collections gathered largely without any coherence. No idea can be formed, he urges, of the Egyptian excavations, if it be imagined that their sole result has been the collections that form the pride of the European museums. For every relic there exhibited, twenty others have been left behind, as imperfect or too difficult to move. At Boolak, on the contrary, all the fragments found have been specially studied, and, however mutilated, are regarded as worthy of being placed in the museum. The result may be found by the general public to be somewhat solemn and severe, but to the student the collection is invaluable.

Not long since great changes were made in the museum with a view to ensuring its greater security from the possibilities of inundation. The interval was taken advantage of to rearrange many of the objects, in spite of the very restricted and inadequate quarters in which the museum is lodged. With the laudable desire of arousing in the native mind a proper interest in the productions of their ancestors, Mariette Bey arranged his gathering in a popular rather than exactly scientific order, but the changes were taken advantage of to effect a re-arrangement. Great difficulties had to be grappled with in the organisation, according to a chronological order; even greater difficulties presented themselves in the way of dividing the collection, as is the case in Paris, and more particularly in Berlin, into separate "civil," "religious," and "funerary" rooms. The largest gallery is filled with thousands of the statuettes, bronze objects, gold and silver vases, and various other relics such as are to be

* See *Builder*, vol. xlii., p. 476.

* Before going further, we would desire to express our indebtedness to the interesting notes of M. Gabriel Charmes on the Boolak Museum, published in the pages of the *Revue des Deux Mondes* in September, 1880.

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found in every public collection; but, it may be observed, nowhere in such profusion or in such a state of preservation as here. In two other rooms are disposed a series of mummies, scarabæi, amulets, arms, &c., found in the tombs, the *bric-à-brac* of a civilisation whose every relic possesses to us its value. The real interest of Boolak is not centred in these objects, specimens of which every museum possesses. The collection of busts and statues is one of the features of the greatest originality.

We possess, it is evident to all students, but very indifferent specimens of the sculptor's art in Egypt. Herodotus and Diodorus Siculus assure us that the Egyptians did not produce their statues as Greek traditions have directed. They divided the figure into twenty-one and a quarter different portions, the execution of which was confided each to a different workman. The result was so precise that the parts when put together exactly corresponded. Where the work was of exceptional importance, the different parts would be executed in precious metals, the head in gold or ivory, the rest of the body in bronze or alabaster. All traces of such statues have, it can easily be understood, long since vanished, or what few have been spared are but very inferior specimens. Many of the statues discovered possess the strong evidence of being portraits, some so markedly that a foreign type is recognisable in the features. Egypt we know was never entirely a self-governed country; its national life in the past, as in the present, was continually subjected to foreign influence. Too rich and beautiful not to excite the envy of neighbouring nations, it has ever been a prey to foreign invasion, but while under alien rule the people, it is to be remarked, none the less preserved unchanged their marked character.

One of the heads of the Boolak Museum,—a fragment detached from its trunk,—M. Mariette has not hesitated to regard as the portrait of Menephtah, the son of Ramses II., the Pharaoh who perished in the Red Sea. The bust of his father serves as a pendant, while round these two are clustered the granite features of Thotmes III., Queen Taia, and many other interesting Egyptian rulers. It would, indeed, be a task beyond the limits of our space to describe all the curious relics of the Boolak Museum. The jewels of the Queen Hah-Hotep have been often described; of the scarabæi there is but little to be said; they rarely possess interest except when bearing some historic name. Of the papyri of the Boolak Museum it requires a *savant* to speak; some are in a marvellous state of preservation, and are decorated with all the delicacy of skill and colour that give such a beauty to the Mediæval missals of Europe. The Egyptian Pantheon is, of course, represented at Boolak by an immense collection of gods and goddesses, in bronze, granite, porphyry, wood, and porcelain, facts which give some idea of the condition of the industrial arts in Egypt. The technical skill of the workmen, we have evidence, was great; of their processes,—they enamelled in a manner which, if it has been equalled, has never been surpassed, —as of their tools, we know nothing. All this portion of the museum, however, may be said to possess only a secondary interest, though it is impossible to pass over in silence the table of Saqquarah, which confirmed, on its discovery, in so remarkable a manner, the dynastic lists of Manetho, or, again, the stèle of Sân or Tanis, a "document" scarcely less precious than our own treasured Rosetta stone.

Perhaps the chief interest of the Boolak Museum may be said to centre in the two rooms,—devoted, one to the relics of the Ancient Empire, the second to those of the Hycsos or Shepherds.

The "Salle de l'Ancien Empire" is in itself a museum, containing, as it does, the oldest relics, perhaps, of human art. Twenty years ago the ancient empire was almost completely unknown. The studies of the Egyptologists stopped short at a great distance from this far-distant past. M. Mariette may be looked on as the Columbus of this new old world,—the oldest, perhaps, of which we possess any traces. His researches brought to light a series of "documents," as our French neighbours would say, of the utmost interest. To judge by the specimens we so far possess, civilisation under the ancient empire had no infancy. Like Topsy (if so flippant a comparison may be permitted), it seems, 6,000 or 7,000 years ago, to have "growed" on the banks of the Nile with the rapidity of the river-plants which come to perfection in a few years and then die down. From its first commencement this civilisation seems to have arrived at perfection; but it disappears as it came. At the end of the sixth dynasty Egyptian civilisation collapses suddenly, only to reappear, four centuries and a-half later, in the eleventh dynasty. During this long lapse not a relic or a fragment shows us the existence of the Egyptians. It would seem as if the Nile had, during those long generations, unintermittently covered the country up, as it does for the few months annually. Nothing is stranger than this long interlude in the history of a people, the most industrious builders of the whole of mankind. No invasion explains the gap, for no ruined buildings of an earlier date attest the passage of an enemy. "Egyptian civilisation," as Mariette puts it, "sank in a cataclysm only the more inexplicable as it has left nothing standing, not even ruins." When, four centuries later, civilisation holds up again its head, its character is deeply changed, it is no longer the genial spirit of the earlier days; in its artistic creations we can trace the grimness of the new ideal. After the representation of the happy scenes of earthly life, we have brought before us the painful travels of the soul in its journey to immortality. Mystery, therefore, it will be seen, shrouds the origin and the close of the so-called ancient empire.

It is strangely characteristic the art of this period as we see it at Boolak; it is essentially what we have come to call realistic; it is the crude representation of facts robbed of any of that high-souled ideal that forms the characteristic of Greek art; and this is the reason of the indifference with which so many regard all Egyptian art. In no manner can its inferiority be shown more strikingly than when by luck one may chance to light upon some creation even only feebly influenced by Greek teaching. Egyptian art is not beautiful in the ideal sense of the word. We are astonished at its creations, it is, as it has been described, "seen" art—not "thought" art. But the antiquity of its creations, and the spell that time throws round all it touches, place Egyptian art beyond the reach of criticism. In these rooms at Boolak it requires but a feeble gift of imagination to picture the sixty centuries that are gathered about one, and to imagine the gods those distant people adored, the poems they learned, the arms with which they fought, the wives and daughters they loved and wept for.

The more closely the creations of this mysterious ancient empire are studied, the more clearly it becomes evident that they were far from being the products of a civilisation in its infancy. Plato would seem to have been aware of this when he spoke of seeing paintings and sculptures executed, he states distinctly, 10,000 years previous to his time. But all is conjecture. Our prehistoric studies are too uncertain to allow of any positive statements respecting a period of which we possess such few remains. Perhaps it is to these distant days that belongs the Sphinx, and beside it the equally mysterious temple which in form resembles no other building in Egypt. It is simply an enormous cube of masonry formed of blocks such as even in Egypt have no equals. The mode in which this mysterious temple is built is an enigma; the stones are laid without order, and the interior seems to have been hewn out. It has been suggested that the work is the production of the period of transition between the time when man inhabited the caves, and that in which architecture first makes it appearance. In the days of Cheops, we learn from a stèle, the temple required restoration. The oldest monument, the date of which is known, is the stepped pyramid of Saqquarah of the first dynasty; it bears, however, no trace of being the production of a half-fledged civilisation. The "Salle de l'Ancien Empire" is certainly by far the most interesting portion of the Boolak Museum, it shows us a glimpse into the history of a world undreamt of till within a few years.

The "Salle des Hycsos" is scarcely less interesting. The fate of Egypt, as has been justly remarked, has been inevitably to find itself under foreign rule. The researches of archæology only tend further to prove this fact, at the same time that it becomes evident how surely and completely their conquerors were absorbed by the Egyptians and their civilisation. Thus it is with the great invasion of the Hycsos, who, on the authority of Manetho, spread over the land at the close of the fourteenth dynasty devastating everything, the Huns and Vandals of ancient Egypt. Twenty years ago this character given to the Shepherd invaders was accepted implicitly, in spite of the evident exaggeration of the historian, whose statement that the invaders destroyed everything before them is amply disproved by the existence to this day of numerous monuments erected long before the advent of the Hycsos. These pretended iconoclasts, research proves were humble worshippers at the Egyptian shrines.

It is in the "Salle des Hycsos," in the Boolak Museum, that the story of these Shepherd conquerors can best be followed. There we learn that, like their captives, they erected huge monuments. At Tanis, Mariette discovered numerous remains of the work of their day, and more than one strongly stamped with the peculiar character of the foreign race.

The importance attached to the two rooms containing the relics of the ancient empire and the rule of the Hycsos will be at once seen. It was in the arrangement of these rooms that the most important modifications were introduced at the time of the recent changes made at Boolak just previous to the death of the late director. Mariette gathered in the former of the two rooms everything connected with the mysterious epoch in which civilisation made its first appearance on the banks of the Nile, and, perhaps, in the world. In the second room he gathered together the relics of a period which till recently has been utterly misrepresented.

The Boolak Museum is not, it will be understood, merely a collection of archæological objects gathered without an aim and shown without system; it is the result of a long period of learned and earnest research, doggedly followed out and amidst the most trying difficulties, the work of a single man who, in twenty years brought to light these treasures, buried for so many centuries under the dust of time. It is scarcely remarkable that the collection should bear a strong idiosyncrasy. And yet the Boolak Museum is but a small portion of Mariette's labours scattered over the length and breadth of the land. Mariette Bey was, indeed, a true archæologist.

Historic archæology is a science, which, as he plainly showed, requires followers not alone merely intellectually strong, but gifted with exceptional energy of character and firmness of will. Egyptology is a branch of archæological research which demands in a large measure these qualities; it is the study of a history which carries us back further than the researches of the Indian, the Assyrian, the Chaldean, and the Sanskrit scholars. But much yet remains to be discovered. It is only in its general features that the subject has been so far approached, the details are each day being filled in. Even those historical periods with which the Egyptologists are comparatively familiar, contain many an unfilled gap. Egyptian art, religion, and philosophy only offer so far a series of unsolved problems. The elements of the science exist, the foundations have been laid, the process of erection is determined on, but that is all; there yet remains much to be done before Egyptology can venture to place itself beside the great discoveries of the century. It is, perhaps, alone in Egypt, on the spot, that the subject can be fairly studied in all its bearings, and it is in such a museum as that at Boolak that more can learned in the course of a few hours' study than elsewhere could be acquired after much laborious research.

Placed as it is at Cairo, on the banks of the solemn Nile, the Boolak Museum is a bond which unites the living present with the distant past. It is an institution, though of foreign organisation, purely Egyptian. It contains the history of a land interesting to every civilised nation. The refined portion of the world would deeply regret to see the Boolak Museum dispersed. Years ago its fate caused constant pangs of fear to its director; but of this fact we may be sure, that should Boolak lose its museum, Cairo, with all its romance, its beauty, and prestige, would lose one of its brightest gems. Beside the grandeur of its mosques, its shady picturesque streets, and its over-towering historic Pyramids, Cairo would be wanting in one of its greatest features were the city of the Thousand-and-One Nights to lose its museum at Boolak.

Sunderland.—Messrs. J. & T. Tillman have been appointed architects for the erection of the new buildings of the Sunderland and Durham County Institute for the Blind, which are to be erected in Villiers-street.

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THE PRELIMINARY REPORT OF THE INSTITUTE COMMITTEE ON THE LAW OF LIGHT.

The Committee of the Royal Institute of British Architects, which was appointed in April, 1881, to inquire into the question of the law of light and air as it affects buildings, and to make such practical suggestions with respect thereto, as may seem expedient, has just issued a short Preliminary report, prefaced by some remarks from the members of the Committee on the scope and aim of the inquiry. Considering that it is more than a year and a quarter since this Committee was appointed, it is somewhat disappointing after the lapse of this time to be presented with no more than the merest outline of a report. As members of the Institute and others are requested to forward further suggestions on the subject, it will evidently be a long time before any final report is in the hands of the profession, and longer still before any practical steps can be taken to obtain an alteration in the law consequent upon any such report. As we said, this preliminary report is prefaced by observations from members of the Committee. Since, however, an important discussion took place at the Institute before the Committee was appointed, upon which we commented at the time, it appears unnecessary to consider these individual opinions at length, or the able historical summary of Mr. Goddard, the author of a deservedly well-known legal work on easements. In may not be out of place, however, to consider the draft report which we assume, so far as it goes, represents the collective opinion of the Committee.

The first head of the report states that "the Prescription Act requires modification, more especially in respect of its conferring an inalienable (indefeasible?) title to light" against reversioners and persons under disability. From this it is evident that, speaking generally, the Committee do not propose any abolition of the Prescription Act so far as it affects the right to light, or, we may assume, of the common law either, which, it may be well to point out, was not abrogated by the Prescription Act, but only supplemented by it, as was decided in the well-known case of Aynsley *v.* Glover, in the Court of Appeal (Roscoe's "Digest of the Law of Light," p. 9). As we stated when the Committee was appointed, we do not believe that any substantial change in the principle of this law can be brought about, especially as the tendency of the Legislature is to shorten existing periods of prescription. That reversioners and persons under disability should be disregarded in this matter of the law of light has always appeared strange, not to say unjust, and therefore we see no reason why this suggested modification should not take place. But it is after all a very small change.

The second head of the report is to the effect that an owner of a dominant tenement should give notice to adjoining owners of all new lights opened or increased by him. That is, we presume, of all new lights and old ones increased. Thereupon the servient owner may register his objection to the light in question. But the criticism suggests itself, why should such a notice and objection not apply to all lights which have not yet existed for the regular statutory period. Again, this objection should, in the opinion of the Committee, be registered in a County Court, and should have the same effect as a physical obstruction to the light itself, in preventing the creation of an indefeasible right to the light. In regard to this latter notice, which we should prefer to call a "notice of interruption," for an objection without an interruption has no legal force, we do not see why the owner of the servient tenement should not take care of himself, and why the owner of the dominant tenement should be obliged to give notice of a new or of an enlarged light. As long as the owner of the servient tenement can prevent the right accruing in a less barbarous manner than the present, the main object is attained. If persons begin to walk across a man's field, so as to commence the creation of a right of way, he can stop them by obstructing their path or by putting up a notice; the trespasser is not required to give notice that he is about to commence the habit of walking across a certain field. As long as a man has the means of protecting himself, it is his own fault if he does not do so, the law should not treat him as a mere child. Subject to this criticism, the suggestion seems to be a reasonable one, but whether the County Court is a fitting place for the registry seems doubtful. We should prefer the local District Registry of the High Court. But if ever we get to registering titles to land the proper place would clearly be such a land registry. The scheme, however, would require much working out, for it is obvious that plans must be deposited with every notice of interruption, accurate verbal description of the light must be given, and all this would cause expense, and would require a special clerk in every registry. That it is, however, a change which is not only feasible, but might be useful, seems hardly open to doubt.

With the third proposal, however, we are wholly unable to agree. It is that a special tribunal should be created to deal with all questions of light. Such a suggestion has been made before, in regard to cases arising under the Building Acts, but it has never been found practicable. With regard to such special tribunal to try questions of light there is one cardinal objection, that it is impossible to have a different tribunal to deal with every different branch of law, especially of a branch of law which does not create so much litigation as some other branches. For example, more disputes arise annually out of charter-parties and policies of assurance than there do out of alleged infringements of the right to light. There is no special tribunal, again, for patent cases, nor for disputes between builders and building-owners. The proposal is, in fact, absolutely and clearly impossible. Moreover, we are not satisfied that the present tribunal is an unsatisfactory one. There is no question that interlocutory injunctions can be obtained with great rapidity, and as the existing block of Chancery cases is dealt with this Division will be able to proceed even more quickly with such cases. Moreover, we may point out that such cases may now equally well be brought in the Common Law Division. The expenses are less there than in the Chancery Division, and all the remedies, either by injunctions or damages, are equally within the jurisdiction of a common law judge. It is, in fact, quite unreasonable that so-called light-and-air cases should be so largely tried in the Chancery Division. We think, however, that a move in the right direction would be the appointment of a rota of professional assessors, one or two of whom might sit with the judge during the trial of such questions to give him the benefit of a professional knowledge. In the Admiralty Court, and in the Wreck Commissioners' Court, such assistants constantly sit. Their province is not to decide or give a judgment, but to assist the judge and to elucidate technical questions during the hearing of the case. Naturally, however, the opinion of the assessors has very great weight with the judge in regard to his ultimate decision.

Again, we do not think that it would be advisable to adopt any absolute angle in regard to the amount of light, though that of 45° often furnishes a useful test. If a man has a right to light, it is obvious that he should be able to recover if he is deprived of a substantial amount of such light, so that he is thereby injured. It is true that it often is a matter which requires prolonged and careful investigation and weighing of conflicting evidence, but once this has been done a satisfactory decision is usually the result.

A change which would, we think, improve the existing law, but which is not suggested by the Committee, is that in no case shall a judge either order a building to be pulled down or prevent it from being completed, even though it infringes a right to light, if the owner of the dominant tenement can be fairly compensated by damages. Since Lord Cairns' Act (21 and 22 Vict., c. 27) was passed a judge of the Chancery Division can give damages, or can grant an injunction, and a judge of either Division of the High Court has, since the passing of the Judicature Act, still more undoubted discretion. But what is desirable is the laying down of the principle that where damages are a reasonable recompense for the infringement of a right of light, they should in all cases be given rather than that an injunction should be issued. The result of the judicial decisions on this point is that the Court will generally award damages if it can, but the decisions are unfortunately by no means uniform on this point (see "Digest of the Law of Light," p. 44). Therefore, there should be an enunciation in the Statute Book of the principle which has been indicated above, so that less discretion would be left to the judges. These are the chief criticisms which occur to us in regard to this preliminary report. We should have been glad, we confess, if the Committee had followed the course of procedure adopted by the Legislature, and have taken evidence not only from England and Scotland, but from America and the Continent. If they had occupied the past year by so doing, and then, as is frequently done by Parliamentary committees, have reported so much evidence as was taken before making a final report, it would have been more satisfactory than the present issue of individual opinions,—preliminary observations, in fact, of members of the Committee, accompanied by a very meagre preliminary report not based, so far as we can discover, on any independent evidence. We can but hope, for the credit of the Institute, that a final report will be issued with the least possible delay, though it is clear from this preliminary report that no great or important change in the existing law will result from the deliberations of this Committee.

SHORING AND UNDERPINNING.

In producing a small and compact essay (it hardly can claim to be called a "Treatise") on the above-named subject,* Mr. Stock has done something to supply a manifest want in the literature of practical architecture and surveying. His little book, however, though well and sensibly written, is not quite so important as it at first appears, since it is in reality rather a statement of what is usually done in ordinary cases, and of what has been done in some cases of special difficulty, than an attempt to show what is the best method of procedure on a definite principle. The book is, in fact, a compilation to a great extent. The author quotes at some length, for instance, Sir G. G. Scott's remarks on his work in shoring and restoring St. Mary's at Stafford, and reprints almost, if not quite, at full length, Mr. Seddon's interesting and valuable description of the shoring of Grosmont Church tower, with the illustrations, both these being apparently taken word for word from the "Transactions of the Institute of Architects," from which also an account of M. Flachat's treatment of Bayeux Cathedral is extracted. These extracts come under the head of "Shoring of Mediæval Structures"; but to one of the most remarkable and important pieces of work of that kind, the shoring and lifting of the nave wall of St. Alban's Abbey, of which there is no account in the "Transactions" aforesaid, no reference whatever is made; a curious omission in a book written for the present day, seeing that the operation in question was the largest and most important of the kind that has been carried out in this country, and that some useful lessons might have been deduced from it. We gave a short but careful account, from notes on the spot, of the manner in which the shoring had been constructed and the lifting force applied (in the *Builder* for 1878, p. 465). The author does not seem to have been aware of this; but he does name at the head of his list of references "The *Builder*, March 15, 1861." There is no number of the *Builder* of that date; a publishing-day fell on March 16th of that year, which number, however, contains no reference to the subject in hand. The volume for 1861 contains more than one report of lectures and discussions on the subject, relative to Bayeux and Chichester; whether it is to any of these the author refers we do not know. The *Builder* for 1859 also contains (p. 341) some account of "a new method of shoring," with an illustration. As one professed object of Mr. Stock's book is to put together information which otherwise is only to be found scattered about in different places, this explains and justifies to some extent the large amount of quotation in the book; but it is a pity in that case that his very first reference should be wrong, and that he should have omitted all mention of what we believe is the only published account by an eye-witness of so important a piece of work as the shoring of St. Alban's Abbey.

In treating of the shoring of Mediæval structures the author has, however, given good authorities, though at second-hand. In the first portion of the book, on the shoring and under-

* A Treatise on Shoring and Underpinning, and generally dealing with ruinous and dangerous structures. By Cecil Haden Stock, Architect and Surveyor. With illustrations. London: B. T. Batsford. 1882.

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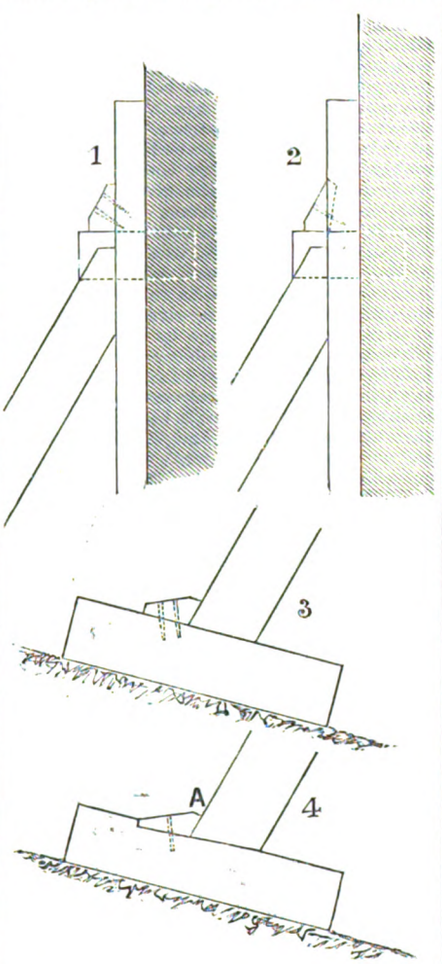
pinning of ordinary buildings, such as street houses, the descriptions are clear and well written, and the illustrations well executed, though a little too small for the best practical purposes of reference. But it appears to us, from internal evidence, that here again the author has been working a good deal at second-hand, and that his authorities in this case have not been eminent architects applying special consideration and knowledge to the matter, but that he has gone upon the ordinary practice of contractors, and upon what is currently approved or allowed by district surveyors. We imply no slight against the practical and scientific knowledge of the latter body of professional men, whose average of knowledge and ability in London is certainly high; but every one knows that a surveyor may, and often does, passively permit a method of construction as legally sufficient and not calling for his actual interference, which he might, nevertheless, by no means actively direct as the best possible way of doing the work. The author frankly admits that he "has been greatly assisted by the kind co-operation of Messrs. J. & J. Greenwood, the contractors for the shoring executed by the Metropolitan Board of Works." If this means anything, we presume it means that his recommendations are more or less founded on the actual practice of the said contractors, who, no doubt, have had a great deal of practical experience. Mr. Stock also dwells largely, and not, perhaps, quite wisely, on the great opportunities presented in London for studying shoring in actual operation. In London, he says, the student has only to turn "sharply round the corner of a street, and he will run against a huge obstruction in the middle of the footpath, the feet and sole-piece of a system of raking shores. He will doubtless at once take out his note-book and rule, and jot down the scantlings and position of the separate struts," &c. If he does, he will occasionally note down some queer things; but, on the whole, he will find the occupation somewhat monotonous, as, in fact, there is, for the most, one accepted practice of doing these things, which is repeated over and over again with little or no variation. This, however, the author says, "is the best way to gain practical knowledge upon anything: see the work begun and carried out to the end, go into its object, criticise it if possible, and consider whether, from your knowledge of the subject, it could not have been better done some other way." Only he says, and very truly, that the student who goes to get information from talking with workmen must go "well armed with terms," for, as a rule, the workman takes it for granted that you understand the phrases he uses, and will vouchsafe no explanation concerning them. This peculiar inability to describe anything except in the usual phraseology of the craft is characteristic of the operative in almost every branch of labour, and is one of the distinctions between the craftsman and the man of science: the latter can give you intelligible equivalents for technical terms; the workman not only cannot do so, but cannot even understand why words intelligible to him should not be intelligible to every one.

There is no doubt the author is right in the importance which he attaches to the actual study of a system of construction in operation, as opposed to mere book knowledge. But the study and recognition of principles in the first instance is a very important preliminary to the study of the operation itself, and to the acquisition of that kind of knowledge which can be obtained from interviewing the workman or the contractor. There seems to be too much indication, in the present work, of putting the cart before the horse in this respect: of the author having accepted the prevailing practice as the rule to go by. It is only on this supposition that we can account for some of the criticisms and recommendations which we meet with in Mr. Stock's pages. For instance, in describing the manner of placing a rider shore, which is made to spring from the back of the next lower shore when the building is too high for the top to be reached by a raking shore in one length, he says:—"In some cases the foot of this rider is made to rest upon a large cleat nailed to the back of the shore below; but the best method is to let it rest on another piece of timber of the same scantling, which, secured to the back of the shore below, goes down to the sole-piece." The best method! It is the only allowable method: the contractor who rested a riding-shore on a cleat depending merely upon nails ought to be rated as incompetent to be trusted with such work, and the surveyor who should permit it as coming *à fortiori* under the same condemnation. The idea of allowing the highest shore of the system to depend solely on the cross-strain of the nails driven through a cleat, and of only mildly suggesting that it is "better" not to do this, is really too absurd for serious criticism.* Then we are told that when an upper shore is too long to be trusted to bear stiffly without strutting, it is strutted from the lower shore or from the wall-piece by planks nailed on side of the two pieces of timber. So it is, as a matter of fact; it may be seen in every street in London where shoring is being carried on, and a more clumsy, unscientific, makeshift dodge could hardly be imagined. Mr. Stock will not find *that* in "Tredgold," to whom he refers as one of his authorities. Of course the shore should be strutted, where strutting seems necessary, by a solid piece inserted between the two shores; that is the only proper and workmanlike way of doing it. No doubt the planks and nails are used constantly, and in ninety cases out a hundred there may be no failure; but it is the business of a didactic work on such a subject to show the best way of doing it, not to record the save-trouble contrivances of contractors and workmen. The faith of the average contractor in cleats and nails is exhibited in other points with a simplicity which is quite touching. The author describes



the manner of abutting the raking shore against the wall-piece, by bringing its upper end to bear on a short needle let through the wall-piece and into the wall, and projecting to take the head of the shore, which, as he rightly points out, should be forked to receive it, in order to guard against the possible fall of the shore in a high wind, should any movement of the wall have left it loose enough to fall. So far, good; then he adds that for further security a cleat is nailed on to the wall-piece immediately above the needle (as shown in fig. 1 in the accompanying diagram). This also is usually done, and it may produce satisfaction to the eye of the workman, and, perhaps, of a surveyor who is the slave of custom; but the cleat when thus applied is absolutely useless, it is a mere piece of nonsense. If, from a new subsidence of the wall, any strain came upon the shore sufficient to bend the needle upwards or make it give way, that same strain would be sufficient to tear away the cleat from its nailings or to bend the nails. If the cleat were placed as in fig. 2, let partially into the wall-piece, it would then be of real use in such a case, bringing the strain on a new portion of the wall-piece; but for any such failure to occur, the needle must either have been unsound or of too thin scantling to begin with. Again, we are told that a cleat is to be nailed on the sole-piece (fig. 3) to prevent the shore from slipping. If the shore means to slip, the nailed cleat *may* prevent it if the strain is not very great, but it is quite a chance, and a most unscientific construction, trusting to the mere power of the nails to resist shearing stress. The firmest construction of all, of course, would be to let the foot of the shore into the sole-piece, as a principal is let into the tie-beam, and then wedge up under the sole-piece; but the author gives a valid reason against wedging, at least in the case of a decidedly rotten and insecure wall, as tending to shake the wall in driving the wedges, and bring about the very catastrophe which the shoring is intended to prevent. It is for this reason that the system of levering the shore up to its bearing with a crowbar is in such cases preferable to driving wedges. But this system may be combined with a more satisfactory method of securing the foot of the shore, by notching the sole-piece as shown in fig. 4, sufficiently far back from the intended position of the shore to allow the heel of the shore to clear the notch when it is first put in position, and after it is levered up to its bearing the cleat can be inserted as shown, and if necessary, tightened up by a slip of hard word inserted at A. It will then be a really firm construction, not depending on nails for its security.

It may not be necessary to take this trouble in small jobs; but in large ones nothing ought to depend on the transverse strength of nails, or the capability of the wood-fibre to resist being torn by them; and a book of this kind should seek to recommend the best and most trustworthy system, not merely that which may be actually in practice. For the same reason we object to the statement that needles, in preparation for underpinning, may be placed at from 6 ft. to 7 ft. apart. That is practically done, but it is the extreme of safety limit; 4 ft. to 5 ft. is the preferable limit to recommend.

The author deserves every credit for having been the first, we believe, to produce a separate work on this subject, which is so important at present when so much rebuilding of old streets is going on; and there is no doubt that his book will be of practical use in calling the attention of young architects especially to the subject, and also as an assistance to them in preparing—

"For the pass-examination at the In—sti—tute."

(to adapt a line from a well-known operetta) as the methods described are those which are in vogue with the metropolitan surveyors at present, and represent therefore exactly what the aspirant for a surveyorship is required to learn. It is one thing, however, to recommend what will "do," and to bring together useful information as to common practice; and another thing to point out the best methods, and the defects of those sanctioned by common practice. The latter should be the object of a complete treatise on the subject, and the present work does not fulfil it, and therefore cannot be regarded as permanently a text-book on shoring, though it is unquestionably useful, as far as it goes. If it reaches a second edition the author may be able in the mean time to consider the subject from a more general and scientific point of view, as well as to enlarge the number of examples, and thereby increase its value materially. A good many, however, will thank him for the information which he has brought together in the present small volume, the rather as there was nothing hitherto in a compendious form.

* Almost equally curious is the recommendation by Sir G. Scott, in his remarks before referred to, not on any account to trust to the floor of the church as a base for heavy shoring. Is it supposed that the members of the Institute of Architects really required such a recommendation as that?

Birmingham Borough Asylum.—A very handsome brass eagle lectern has just been presented to this asylum in memory of the late medical superintendent. The work is from Messrs. Jones & Willis.

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FIFE HOUSE:

A RETROSPECT AT WHITEHALL.

Sir,

You must no more call it York-place. That is past;
For, since the cardinal fell, that title's lost:
'Tis now the king's, and call'd Whitehall.

"PROPOSALS for taking this Land on Lease will be received by the Commissioners of Her Majesty's Woods." Such is the announcement which, at this juncture, thrusts itself upon one who may seek for a quiet half-hour within the shadow of Inigo Jones's masterpiece in the western quarter of the town. Passing through some fine old gates with railings on a dwarf wall, which it is a comfort to know have already excited the acquisitiveness of more than one connoisseur, one enters a large neglected waste lying between Whitehall-place on the north, the Embankment Gardens on the east, and Middle Scotland-yard with Whitehall-yard on the west and south. Containing fine old trees, massed shrubs and gentle declivities here and there, its former propinquity to the river when Boards of Works and Embankments were not, is sufficiently indicated by the ghost of a lifeboat which rests upon its keel in the midst. Two or three children are at play, innumerable birds chirp their evensong, but all else, even to the squared stones scattered about, speaks of a time that is gone for ever. Readers of this journal will be familiar with the site, if not with the actual garden, in connexion with the much-vexed question of the Government Offices Bill.* We do not propose here to touch upon a matter which is fully treated of elsewhere in these columns. Still, with the ominous inscription, "Site for the Hotel Metropole," standing up from what was the neighbouring garden of Northumberland House, it may be well ere its every trace is obliterated by the combined labours of surveyors, architects, and builders, to devote a few words to the historical associations whose memory lingers around.

Whitehall-yard itself is the survival of the court that lay within the entrance-gate of King Henry VIII.'s "Palace at Westminster," as he by statute (28th Henry VIII., cap. 12) named the palace which he established on and around the York-place of the fallen cardinal. The existing residence he so improved and enlarged, in the Tudor style, as in a manner to rebuild it. Upon the accession of King James I., Whitehall, with its neighbour "Scotland," the present Scotland-yard, underwent further changes. It is readily conceivable that King James VI. of Scotland cared little to perpetuate an abode which proved a standing monument of a homage due, and sometimes paid, to the Emperor of Britain by the sovereigns of what is now the north-western part of Scotland. But with Whitehall the case was different, and there he employed the constructive genius of an Inigo Jones. Of his plan nothing was carried out but the Banqueting-house, which balanced, though it did not harmonise therewith in design, Holbein's gate across the thoroughfare which led southwards into King-street.† The troublous times of King Charles I.'s reign prevented him from resuming his father's proposals. Of his sons, the one expended what little he could spare from less worthy objects upon a palace at Winchester, the other had neither inclination nor opportunity to promote the new scheme. In William III.'s reign the palace was twice attacked by fire,—in 1691, and again in 1698,—on each occasion in consequence of a maid-servant's negligence, the later fire raging for upwards of seventeen hours spared hardly anything but the Banqueting-house, and the finest out-door statue that London possesses. There are three or four sets, all diverse, of Inigo Jones's plans. One will be found in Campbell's "Vitruvius Britannicus," 1717; another was published by Kent in 1727; and another, showing the four fronts, by Lord Burlington, in 1748-9. There is also a set at Worcester College, Oxford. Those in the "Vitruvius" are considered by some not to be genuine. Wren drew up plans for furthering the conception. One set he made for King Charles II., and two others, after the later fire for King William III.

Taking the palace as it appears in Fisher's drawing of 1680, we see that the principal court was entered by the gate that stood between the recent hideous addition to the northern side of the banqueting-house and Lord Carrington's house, the site of the former Wardrobe. Towards the river the court extended as far as the wine-cellars, beyond which a passage led to the public stairs, having upon its right the pantry and kitchen, upon its left the great hall and chapel. At this date the cellars, hall, and chapel are replaced with the office of the Medical Board, and Nos. 4, 5, and 6, Whitehall-yard. The white house on the northern side of the yard between what was Lord Stuart de Rothesay's house, now the museum of the United Service Institution, and an entrance to Lord Carrington's stables, was the Confectionary. The offices, opposite, of the Board of Trade, having an elegant doorway of George II.'s time, stand over the old Exchequer Office, and retain in their basement some fine old stonework. By the side of Viscount Gage's, No. 4 in the yard, may yet be seen a piece of old wall. To the south of the Banqueting-house was the extensive privy garden, stretching as far as Montague House and Richmond-terrace. In it were set up the famous dial constructed by Francis Hall in 1669, and the bronze figure of King James II., carved by Grinling Gibbons in 1686. The latter, which now faces the entrance of the Board of Trade, is vulgarly but erroneously believed to point to the spot where King Charles I. suffered martyrdom.* The remaining space, bounded on the south by the bowling-green of King Henry VIII., on the north by a further court and Scotland-yard, on the east by the river, and on the west by the cockpit, tennis-court, the tilt-yard and its gallery, was taken up with about sixty sets of apartments, whose occupants are named in Fisher's plan. Lady Villiers, for instance, lived in the rooms east of the gate at the northern end of King-street; the Duchess of Cleveland had lodgings by the privy stairs. Here, as on one memorable evening spoken of by Pepys, she was exposed to inundations from the Thames. With a lively recollection of such mishaps King Charles II. begged the House that his expected wife "might not find Whitehall surrounded by water." It was no uncommon thing, indeed, for the Treasury chambers over against King-street to suffer from flooding even at a more recent period. The Dukes of Monmouth, Ormond, and Albemarle had chambers between the tennis-court,—where now stands the Privy Council Office,—and the tilt-yard, where was until lately the Adjutant-General's Office, Horse Guards. The old Treasury chambers were behind Gwydyr House, the office of the Charity Commission. The rooms of James, duke of York, occupied the site of the house in which Sir Robert Peel died, in Whitehall-gardens. Lord Fife's house was erected over the "small beer cellar" of Hollar's print, No. IV., a little to the east of the United Service Museum. Here, singularly enough, one stands not upon English ground, but on the very soil of Scotland. The story runs that that nobleman was at great pains to cover all the land with earth, &c., which he caused to be brought in vessels from the further side of the Tweed. His executors leased the house to Lord Liverpool, who died here in the year 1828. Fife House, which was subsequently used for the purposes of the India Museum, together with Little Fife House adjoining it, were pulled down soon after the expiration of the crown lease in April, 1864. Their gates, opening into Middle Scotland-yard, with the stables along the southern side of the garden, are all that remains of them at Whitehall, though part of the staircase of Fife House is preserved in the South Kensington Museum. To the east of their site still stand two old buildings, which are well worthy of inspection. They are the ancient "Beer Buttery" of the Palace. The ground floor, built of stone, contains one or two good doorways, and in the southern of the two,—the Almonry Office,—is a fine Perpendicular window. Before Fife House was built, the water flowed up to a walled terrace that ran along the riverside from the buttery as far as the public stairs. The archway beneath the northern of the two houses,—the Queen's Treasury,—formerly opened upon this walk from York-place and Scotland-yard. Upon the building of Fife House some of the foreshore was reclaimed, as far east as the inner paling of the Embankment-gardens extending to the stairs. The causeway, blocked with refuse and rubbish, may yet be traced. The house known as the Queen's Treasury had been given over for the use of Queen Caroline, wife to King George II., and afterwards for that of the Consort of his successor. The Almonry Office had been the treasury of the Princess Dowager of Wales. In the year 1805 it was granted to Queen Charlotte for the offices of her secretary and comptroller. This building will have to make room for the forthcoming building operations. Sir John Vanburgh's house, the "Goose-pie" of Swift's satirical lines, and which he had built for himself from the ruins of Whitehall, was situated to the south-west of Fife House. Hollar, Vertue, E. Rooker, J. T. Smith, with other artists, made many interesting pictures of most of the places I have here mentioned. One of the finest views ever presented in London was that from the western end of Whitehall-place, looking due east across the low wall which stood at the further end, to St. Paul's in the distance, a vista since destroyed by the interposition of the monstrous South-Eastern Railway bridge.

Walking around this garden, one's thoughts naturally revert to some of the scenes and events of which it is a mute survivor. Summoning to the sessions of sweet silent thought the remembrance of things passed, we may conjure up for a few moments the magnificent "full-blown dignity" of Wolsey, the feasts with which he would entertain his sovereign at York-place, and one of which, described by his faithful Cavendish, yet lives as of yesterday in the pages of Shakspeare; we see him, deserted and dishonoured, take boat at the stairs for the home at Esher, which he had established near his other palace upon the opposite bank of the river; by-and-by Anne Boleyn, all rejoicing, is welcomed to a palace from which she is shortly to be hurried to the Tower Green. Seated at a window by the Exchequer, the weakly son of Jane Seymour listens to Ridley preaching in the privy garden beneath. Soon the tournaments and passages-at-arms, in which his right royal sister so much delighted, give place to the drunken revelries of her successor on the throne; these varied, it is true, by the exquisite masques upon which Jonson bestowed all the resources of his fancy and Inigo Jones the efforts of his taste and skill. One episode stands forth, horrible, beyond all the rest. A king comporting himself with "the placid courage that has half-redeemed his fame," and which inspired the pen of even such an opponent as Andrew Marvell, is beheaded in the open street before the Banqueting-house, the populace sending up to Heaven such a cry as had never been heard before! Passing by the affected austerities of the Puritans, we linger awhile in the company of those who crowd the pages of Pepys, Evelyn, and Grammont. We may smile at the first-named relating with what pleasure he saw the laced petticoats of my Lady Castlemaine hanging in her garden, or recall the description that Evelyn gives of how King Charles spent his last days at Whitehall. More anxious times are near at hand. A young queen and her infant son are sent away by stealth one winter's night in a coach to the ferry at Millbank; with the child asleep in her arms she stands for hours by the tower of Lambeth church seeking its small shelter from the rain. The next day she is followed by the king who, in the impotency of his flight, takes boat at the privy stairs and drops the Great Seal into the river. Not long after, his daughter Mary returns as a royal consort to the home of her childhood, going about from room to room in the ease of security and the pride of possession, but with no regard for the occurrences which must have been present to her mind, or for the father whom both she and her sister had deserted. Reflections like these are awakened by the prospect which just now lies around the site of Fife House, a prospect that adds yet one more example, were, indeed, such an addition needed, to the mutability of human affairs, in which our sovereigns, in common with the meanest of their favourites, have had their appointed share.

* See the *Builder* for August, 1877, *et post.*

† This gate was taken down in 1750. William, duke of Cumberland, intended to set it up, with two wings, in the Long Walk at Windsor, where he was ranger. His project failing, parts of the gate were incorporated in some of the keepers' lodges. Of the eight bust-medallions, in terra-cotta, the work of Torregiano, which adorned its two fronts, two are preserved at Hampton Court, three (retouched by Flaxman when a youth) at Hatfield Priory, near Witham, in Essex, and two in lodges at Windsor. The King-street gate, at the end of Downing-street, was pulled down in 1723.

* The inventor published an account of the dial in a scarce pamphlet printed at Liege in 1673. A view of "The grand Pyramidical and Multiform Dial" is in the Crace collection at the British Museum.

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A FEW REMARKS ON THE "HOLY PICTURES" IN HOLY RUSSIA.

If the ecclesiastical architecture of Russia appears to a visitor as being the most remarkable of the sights that meet his eye in that assemblage of all that is odd and incongruous, the idols or pictures of saints with which some of them abound, and all are supplied, must strike an Englishman as certainly the most extraordinary objects which have yet presented themselves to his gaze. The joss-houses of China, the weird and wonderful temples with their idols in India, from Bombay to Delhi, hardly seem to the observer so strange as the holy pictures in the churches of Russia. In Asia we see the results of some very ancient systems of symbols in which the life has gone out, and left a dead form now surrounded with other attributes than it ever possessed when living. Thus we know that the many-armed idol of Brahma simply represented the infinity of his power, by no means pretending to be the portrait of a monster. For all this a little study prepares us; a little reflection helps us to trace the grand ideas of the old primæval faith in the grotesquerie of later Brahminism. But we are not prepared to understand the reduction of Christianity to a level below that of Brahminism. It is, however, if painful, instructive to watch the decline of the pure and simple faith of the early Christianity, until we come to the virtual polytheism of the orthodox church.

But it may be objected, what has the holy picture to do with the *Builder*? The reply is, "Everything, in Russia, at least"; and to prove the truth of this assertion we must begin from the beginning.

It is hardly necessary to remark that there are many saints in the Russian calendar, in fact, there are so many that the year has not days enough to accommodate them, so that several have to be crowded into one day. The 22nd of February, for example, does duty for twelve different saints; nor is this an isolated case. When a child is born into this land of saints, one of those whose day happens to coincide with that of his birth, is chosen from the crowd who would, any of them, be happy to stand sponsor or patron saint. The saint being chosen, the child is called after him or her, and a picture is bought of the said saint or saintess (guaranteed *like*), and hung in the eastern corner of the room where the child lies. Before this picture, called an obrass, a little glass vessel is suspended, filled with sacred oil, feeding a wick which burns before the picture on Saturday evenings and on the evenings of all church festivals. In the higher grades of society, this picture takes either larger or smaller dimensions, but *no* room in *any* Russian house is without one. Some of the more learned or refined reduce the picture to a very minute miniature; some, again, and especially the rich merchants, have the most obtrusive saints imaginable all over their houses.

We have supposed a boy born into Holy Russia, and his godfathers and godmothers provide him with a patron saint or good angel, who will see him safely through all the chances and changes of this mortal life, who will *say prayers for him*, if the patronised boy perform the required ko-too to the saint, and in every important event of his life he will play the patron's part. On building his house the picture is brought to the site contemplated and invoked to aid the work. When the roof is finished a large (very large) garland, bigger than Jack-in-the-green, is raised on the apex of the roof. Within that garland, snugly ensconced, sits the patron saint in miniature. When the rooms are finished, the holy pictures are hung with their lamps in the proper corner, and impart safety from evil influences of all kinds. The possessor grows rich, lets his house, and builds another, to which he retires with his penates. Suddenly there is a cry of "Fire!" The pojarniks, or firemen, are sent for, but before they can reach the spot an act of touching faith is performed. The proprietor sends for the priest, deacon, and some interior power in the church, who arrive on the scene of destruction in full canonicals, with the obrass! This picture is presented to the fire, held up, high up, in the hands of the priest, so that the fire shall have no excuse about not being aware of its presence, and if the flames be extinguished, then it is the work of the Saint, whose irresistible picture came, was seen, and then conquered. The result may never be ascribed, save inasmuch as they were passive instruments of the picture, to the pojarniks.

When the pious Russian marries, his obrass and that of the bride are introduced to each other, and are freshly blessed by the priest. They occupy stations on the same screen in the marital chamber, while a fresh one is executed for the cabinet of the master of the house, and when he dies his obrass is carried by some trusty servant or friend at the head of the funeral procession, after which it becomes the property of his eldest son, and is never left, by will, out of the family.

The mujik has his obrass, which he invokes for a good harvest, and occasionally chastises for neglecting to listen to his prayers. The merchant on leaving home for "town" in the morning bows bareheaded to the east, crossing himself devoutly before beginning the business of the day. He goes to his shop or office or store, and there his patron saint is found in glory, surrounded with a superfluity of gilding, often adorned with expensive flowers, being also at certain times propitiated by a little wax taper, for which all the saints seem to have a weakness.

In the homes of the wealthy merchants, besides the saints in the corner, the lady of the house frequently has a picture-gallery, not of portraits of her children but of their saints. These are generally set in frames of massive gilding, and for the most part their surface is covered over with plates of silver or gold, with apertures left, through which the faces peep out. All these pictures are set into one gorgeous, golden frame, and being so overladen with gold and lver and other ornaments, the effect, especially when the lamps and little tapers are lighted up, is very startling. Before this screen a good mother says her prayers, prostrating herself, and touching the floor with her forehead, in her passionate appeals to each saint separately, on behalf of the son or daughter who may be specially under the tutelage of such saint or saintess.

Such being the influence of the saint in private life, and such his connexion with a family, it is no matter of surprise that churches should be raised to special saints in districts under their immediate protection, while a reference to the calendar with its overcrowded population of holy men and women, will at once explain the mystery of the number of churches in the large towns, especially in Holy Moscow. Often the picture of the saint in whose honour a church is built is placed over the chief entrance outside the church over the porch; but whether this be the case or not it is generally well known to whom the edifice spiritually belongs; thus, in driving through Moscow, a visitor is apt to be startled by his driver suddenly seizing his hat, and violently crossing himself, ejaculating the whole time in a manner that recalls vividly Shakspeare's,—

"Swears a prayer or two and sleeps again."

Two men may be in animated conversation or altercation in the street, when one of them recognises a church to his saint, suddenly stops short, pulls off his cap, and bursts into a variety of gestures, bowing, rapid crossing, and sometimes even prostration, before a church, while his companion regards the whole scene with supreme indifference. It is not *his* saint. At last this extreme devotion comes to an abrupt end, and he resumes the dispute which it had interrupted with all the vigour he had shown in the beginning of the contest, and at the precise point at which it had been dropped.

Again, if the houses be thus sanctified by the presence of these holy pictures, and the sleeping-rooms and cabinets of the wealthy be thus profusely decorated, we should be led to expect something very magnificent, as far as carving and gilding are concerned, in the interiors of the churches; nor are we disappointed. The grand feature of most Russian churches is a screen with three doors partitioning off the high altar from the body of the church. This screen is gorgeous to the highest degree, being overlaid with elaborate carvings, sumptuously gilt, and bearing many pictures. When those of the four Evangelists preponderate, the arrangement is often that one picture covers each door, the centre door being double, like the folding-doors of our drawing-rooms, would naturally require two pictures, one on each leaf or fold. There is an ascent of some steps from the body of the church to the screen, and at the top of these steps a railing, behind which are three desks,—one in the centre for the priest, another on his right hand for the deacon, and the third for the precentor, who leads the chorus and gives the key-note in various parts of the service, which is *all singing*. At a certain part of the ceremony the folding-doors are thrown open, revealing the Holy of Holies, magnificently, gorgeously decorated, and invariably provided with a dove of white in a blaze of golden glory. In the midst of this imposing scene stands a richly-ornamented altar, covered with an embroidered cloth all sparkling with gold and silver lace. The priest has assumed a purple cap bound with gold, something between an imperial crown and a mitre; his dress is of silver tissue or cloth of gold, richly ornamented; he wears a rich gold chain (gilt) with a massive cross. At the end of the Mass all persons present are expected to kiss another, a larger cross, which he extends to them.

The interior of the church is filled with pictures hanging round the walls, sometimes painted in fresco on them, and occasionally, but rarely, possessing artistic merit. They often represent passages from Scripture history, but more frequently scenes from the lives of Russian saints. We have been told that no good painter will paint a saint, not from any contempt of the holy character of the canonised gentleman or lady whose portrait may be required; on the contrary, the painters themselves are often devotees also, and believe in the pictures as much as the most illiterate mujik. The reason for not wishing artists of fame to produce holy pictures is a sacred fear lest the idolon should become the idol (which, however, it has most emphatically done), lest the attention of the worshipper should be drawn to the excellence of the picture rather than to the higher excellences of the saint; consequently, most of the precious pictures are what would be irreverently pronounced "precious daubs" by the uninitiated. The holy picture, like holy water, must be blessed by the priest before it can be efficacious, and owes none of its efficacy to its style or execution. In short, the less merit the picture possesses the more merit have the priests.

In all early mythology the female element in the human soul has been represented under the forms of various goddesses. We need not refer to all the names of the ladies of the Pantheon or in Valhalla, but one in each system seems to have been better known than the rest: in the Hellenic system, Venus and the Teutonic Freya. In both races the want was supplied in the new regime by "Our Lady," the "Mother of God," in which form and under which latter appellation the Virgin Mary is to be found all over Russia. Sometimes she is represented with the infant Saviour, sometimes as adoring the risen Christ, but of all saints and saintesses she is certainly the favourite. Some pictures of her, exhibited in one of the churches in the Kemlin, are so holy as to be considered useful in certain diseases, and numbers of people press to them to kiss portions of the canvas left bare of gold or silver plating for that purpose.

One of these pictures of the "Bojemat," or Mother of God, at a sort of chapel built before, or rather in, the Iversky gate, near the Kremlin, has a very exalted reputation for sanctity. If any one be very ill or dying, she is sometimes sent for to the house of the sufferer, but as she never travels without six horses and attendants (clerical and lay) in proportion, this is an expensive remedy, and is said not always to be successful. When the carriage with the sacred picture inside, with priests in full canonicals, drawn by six black horses, with bareheaded riders, drivers, and attendants, drives through Moscow, then all people take their hats off, all bow low as the carriage passes, many kneel on the ground, and some fling themselves down on the track of the wheels and touch the earth with their foreheads. The excitement throughout Moscow is universal, and the picture's progress is a triumph.

But far more touching is the sight of the picture on a visit to another, or receiving another picture at the Iversky. When this solemnity occurs, the priests are in high feather; the Bojemat is gently lifted from her place and put *vis-à-vis* with her visitor, rather close to the visitor, and all present retire to a distance leaving them, from motives of delicacy, in undisturbed communion. When so solemn an occurrence takes place, mounted *gens-d'armes* keep the ground that the press of the piously-minded may not interfere with the decorous

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and solemn stillness which prevails until, at the end of the interview, high mass is celebrated, and then the visiting picture drives home to her convent.

On the same side of the Kremlin, but at the remote extremity of the long wall fronting the Gostinnie Dvoer, or bazaar of the town, is another gate, one actually leading into the Kremlin itself, while the Iversky only leads into the grand ploshad, or platz, or place, before the northern wall, over which another picture stands, of such miraculous antecedents as to deserve rather more respectful treatment than any of the rest, and until a few years back soldiers belonging to the fire brigade were posted to compel all such as were not "devoutly and religiously disposed" to take their hats off, if belonging to the harsher division of humanity, or to lower their parasols if of the softer sex, when passing under this Spaskie Vorot, or "St. Saviour's Gate." Non-compliance with this requirement would have been punished by transportation to Siberia in the old time, but now that the pojarniks are removed, there is no danger in going under with your hat on, save that of being stoned to death by the pious mujiks. There are two legends about this picture, both referring to one epoch of history, and to the one grand event in the picture's existence.

When Napoleon I. visited Moscow, he was bent on destroying this picture; and on being told that it was indestructible became the more resolute in making an end of it. He ordered a party of men to advance on the gate and tear down the picture by main force, but it was impossible. Some of the men fell down, others tumbled over them, the officer commanding the party was stricken with blindness, and so time was lost until the evening, when all these efforts were discontinued. In the morning the Emperor was told that the picture was still hanging in its place. Full of rage, *more suo*, he ordered up a gun to blow the thing to pieces. In those days artillery was not so perfect as now, and guns were fired by a linstock having a burning match affixed to one end, which, igniting the powder used as priming, discharged the piece. When the "gunner held his linstock yare," down came such a torrent of rain as extinguished the match and Napoleon's ire at the same time, sending him to seek shelter, where fresh events soon caused him to forget gate, gun, and picture.

The second version of the same story is more characteristically Russian. It tells how, when Napoleon came to destroy the world-famed picture, various obstacles presented themselves, until at last he ordered scaling-ladders to be brought, and the picture taken down. While the ladders were being brought, a thick fog set in, and when it cleared away the picture had "cleared away" too! It had vanished as neatly as though it had never been there. Full of rage, Napoleon caused great search to be made, and offered immense rewards for it. In vain! At last he left Moscow, and some time elapsed, what with the rebuilding of the wooden town, and various other occupations of the Muscovites, before attention was directed to the vacant space where the picture ought to have been, and where its absence was regarded as a disgrace to Moscow. Large rewards were offered by the ecclesiastical authorities, as had before been done by Napoleon for the discovery of the whereabouts of the picture. Still all in vain! At last it was resolved to have another picture painted to replace it. The new effort of art was brought on a certain day, when in the presence of great masses of the people the priests were to consecrate and bless it as soon as it should be placed *in situ*. All was ready. An immense concourse was assembled to witness the imposing ceremony; the priests had begun their solemn chaunt, and workmen ascended ladders to draw up the new inmate to the niche, when, lo! the old picture was discovered calmly placed as before the advent of Napoleon, and as cool as if nothing had happened.

But there is an under-plot to the legend. Not far from the gate, a monastery during Napoleon's visit became the scene of a most unheard-of transaction. The monks were startled at prayers by seeing in their church, without being aware of how it got there, the picture from the Spaskie gate. Of course, they said nothing about it, and no rewards on the part of Napoleon or any other person could bribe them into the betrayal of the confidence placed in them. After Napoleon's departure, when rewards again were offered, the monks still maintained a discreet silence, probably thinking (and the event showed how correctly) that a picture that knew where to hide would know when to leave cover. On the day that the picture reappeared over the gate, it had disappeared rather abruptly and shabbily, without a sign of gratitude for the asylum which the monks had granted and kept secret, without a word of adieu even to the good monks, she was off. It is said that the convent became very rich. Here, however, a little too much is said in winding up the story, giving it a strong flavour of that other land of miracles, the "Emerald Isle," the final observation being that "the monks grew rich, their monastery flourished, but as they never divulged the name of the place where the picture sought sanctuary, *nobody knows where that monastery is to this very day.*"

Of course these are not isolated stories, there are numerous tales, as startling, of cures wrought by pictures, of the miraculous escape of pictures from the perils of water, fire, and thieves, of a picture turning the fury of the Tartars upon themselves, diverting it from a monastery; but our purpose is not to hold a religious feeling or belief up to ridicule. It is a natural law in religious history that a phase of simple faith should degenerate into irrational superstition, to be succeeded, very often, by infidelity before actual truth is arrived at. The Russian peasant is simple and ignorant; his mental condition would not enable him to grasp any more abstract faith; hence, in all probability, that of the present system is the best adapted to his mental state, and is, doubtless, preparing the way for something higher.

There are no pictures older than the beginning of the seventeenth century, the majority being imitations of a very late style, itself an imitation of an ancient one. The attitudes and drawing remind one of the execution of the Bayeux tapestry, and some figures in Anglo-Saxon MSS. They are usually extremely dingy in colour, save the brand-new paintings in the more modern churches, which are glaring in blue, scarlet, and gold.

With so many demands on the powers of the saints, it is only natural that the trade in holy pictures should be brisk. Whole lines of shops in the Gostinnoi Dvoer or bazaar, answering to streets in any other town, are devoted to the sale of these works of art (?), and to the frames and decorations belonging to them. Also the various articles for the splendid service of the Russian Church are to be found here in profusion. Sometimes the metal coverings, which conceal every part of the picture except those meant to represent flesh of the face and hands, are of boldly-executed plated ware, sometimes of solid sterling silver, sometimes of fine ducat-gold, consequently the price of such armour varies greatly. The size of the pictures also varies from the unobtrusive obrass of the polished noble, not more than 2 in. by 1¼ in. in surface, to the ostentatious display of piety, characteristic of the merchant, manifested in a holy picture 3 ft. by 2 ft. 6 in., blazing in gold. Again, for the humbler classes, cheaper forms of pictorial sanctity may be observed, so that in this portion of the bazaar prices for saints range from a kopek (about a farthing) to 5,000 or 6,000 roubles, or as many hundred pounds.

Mention has been made of the tapers burnt in honour of the saints before their pictures. They deserve, perhaps, more respectful treatment than the very slight notice we can bestow upon them. They are a source of very considerable revenue to the church, the lower officials of which are allowed to sell the tapers, which the priests are paid to bless. The consumption of wax throughout Russia is something enormous, and the sizes of the candles consumed vary from the thinnest possible taper, as thick as an ordinary drawing pencil, to the majestic columns of wax burnt on high holidays in honour of such important members of the community of saints as St. George, St. Nicolas, St. John, and a few others. These latter are as thick as a stout man's arm, and are set in massive silver candlesticks standing free on the floor of the church. Round the tops of these candlesticks are small holes into which the little tapers of the poorer worshippers are inserted. In the same way there are occasionally narrow pieces of wood with similar holes affixed to the lower portion of the more popular picture for the reception of small tapers. Not only does the church profit by the sale of the candles, and enrich herself by the fees for their receiving the requisite blessing prior to their illumination before a picture, but the butt ends of the burnt-out tapers, and the drippings of wax from the many candles and tapers all over the church, are carefully collected and melted down again to form fresh candles to be resold to the public.

These candles represent, very frequently, the prayers and desires of persons far remote from the church in which the holy picture is enshrined. Thus it is not unusual for a friend in some distant town to write to another at Moscow with a request that he may buy for him a candle, and burn it in his name before the picture of St. Dmitri at Moscow; he will indicate the size and price, feeling sure that all will be as he wishes, for no Russian would decline or neglect so sacred a duty. Before proceeding on a journey, the Russians propitiate their saints with these holy tapers, and feel sure that they will be duly watched for and taken care of. Nor is it only for good purposes that holy pictures are invoked by means of holy candles. Thieves and other evildoers bribe their attendant "angels" (?) to help them in all sorts of swindles, robberies, and other crimes, by lighting candles at their pictures. A case is on record of a clerk intending to rob his master of 10,000 roubles, at Moscow, sending an accomplice to Kazan to light a candle worth 3 roubles, before the celebrated picture of the "Mother of God" there, while he performed the same rite in Moscow before a well-known picture to the same holy individual in a church in the latter city. The time was well calculated; the crime was committed while the two candles were burning, the Kazan scoundrel praying for the success of his accomplice. The robbery was eminently successful, having been completed before either candle burnt out, and, of course, the "Bojemat" became highly popular for thus aiding her devoted adorers through thick and thin.

It is difficult to arrive at the actual statistics of the consumption of wax in Russia, but it must be enormous. The bees of Little Russia and the Ukraine supply the greater part of the demand.

The private picture, sanctifying the home and every room belonging to a Russian, is called technically the obrass, while the more public picture, such as we find in churches, monasteries, and convents, are termed ikons. The screen to which we have alluded as dividing the Holy of Holies from the body of the church, is the iconostas. The door in the centre, called the Imperial gate, is sacred, and no one, save the Emperor and the officiating priest, are ever allowed to pass through it. The deacons, decatchock (or under deacon), and the chorus, pass through the doors to the right and left, but not through this holy door. At the celebration of high mass, it is flung open, disclosing the altar with the high priest before it, just at the moment when the transubstantiation of the elements is supposed to have taken place, and then the high priest, elevating the host, stands under the arch. This is solemn and picturesque, while the solemnity and picturesqueness are increased by the simultaneous prostration of all the worshippers there present.

The Christian Church throughout the world professes to abhor idolatry, but there are some observances in forms of Christianity, nearer home than Russia, that tread so closely upon image worship as to cause pain, and perhaps even anger, in the hearts of other Christians, and, if it were possible in these days of perfection, to give rise to a feeling of contempt for their erring brothers. We sincerely hope that these remarks may be productive of no such feeling. We are not writing a discussion on the tenets of the Greek Church, nor do we aim at anything beyond an unvarnished tale of what the value of the holy picture is in the eyes of the orthodox believer. We may be pardoned for adding that the more learned priests justify the use of pictures as not being "graven images," and therefore not coming within the letter of the prohibition in the Decalogue. They are, they say, necessary on account of the constant want in the untutored peasant to be reminded, by some external symbol,—something tangible,—of the existence of a higher life within. We believe this argument of the Russian priest to be the key to the external and symbolical religion, the remnants of which we term mythology. Nothing is despised by the wise, and it may be that valuable teaching for our more advanced position, as we naturally regard it to be, may still be extracted by careful hands even from the holy pictures of Russia.

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THE GERMAN ARCHITECTURAL AND ENGINEERING UNION.

On the third Monday in August, the 21st inst., the Fifth Annual Congress of German Architects and Engineers will assemble in the city of Hanover. From the programme which is lying before us, it is evident that this will be one of the most enjoyable *réunions* which the members of these professions in Germany have ever had the opportunity of attending. We recently gave in the columns of the *Builder* the names of the various societies belonging to the Union, whose members, as we then pointed out, number upwards of 6,000. It is expected that more than one-tenth of these will be present at the coming Congress. Most of the chief railways of the German Empire,—from Tilsit, on the borders of Russia, to Strasburg, on the frontiers of France,—have willingly agreed to reduce their fares, and to make other concessions to gentlemen proceeding to the Congress. In Hanover itself, the local society has appointed a special committee to receive guests, and supply them with such information as to apartments, &c., as they may require. The office of the Reception Committee will open on the 18th of August, in Hartman's Tunnel, opposite the railway station at Hanover. The General Inquiry Office will be in the Old Rathhaus, Köbelinger Strasse. The general meetings will be held in the large hall of the Old Rathhaus. The sittings of the Architectural sections take place in the same hall, while those of the Engineering sections will be held in the smaller hall of the same building. The preliminary public reception of the visitors is arranged for the evening of Sunday, the 20th inst., at eight o'clock, in the Old Rathhaus, when the guests will be entertained at the expense of the municipality of Hanover. At nine o'clock on Monday morning the opening general meeting takes place. Among the agenda we find a paper by Herr Kyllmann, on "The Value of Exhibitions for the Technical Arts." This will be followed by reports on the following questions:—(1) Improved methods of supplying and employing water for agricultural, manufacturing, and commercial purposes; (2) the practical training of technicians after the completion of their academical studies; and (3) subdivision of the Government examinations in architecture. The first sitting will wind up with the discussion of new proposals for improving the organisation of the Union. At eleven o'clock the members adjourn, when they will be entertained at a *déjeûner* in the extensive saloon in the basement of the Rathhaus, known as the Rathskeller. At twelve o'clock noon the sectional sittings will commence. In the Architectural Department the subjects to be dealt with are:—(1) The restoration of Mediæval monuments; (2) report on measures for securing theatres against dangers from fire; and (3) the construction of fire-proof buildings. In the Engineering Department the subjects are:—(1) On the correction of the tidal sections of rivers with special reference to the Lower Weser, by Herr Franzius; (2) report on the employment of steel in architectural structures; and (3) report on the measurements of flexion in iron bridges. At two o'clock the members will proceed to inspect some of the most interesting buildings in the city according to a special programme. At six in the evening a banquet will take place in the saloon of the charming Tivoli Gardens. The first day will conclude with a *soirée* at nine p.m. in the saloons of the Artists' Club, attached to the museum. On Tuesday, the 22nd inst, the sectional sittings commence at nine a.m. At noon a special train will convey the members on an excursion to Brunswick, for which the Architects' Club of that city have arranged a special programme. After inspecting the chief buildings of interest, the party will be entertained at a banquet, and return to Hanover by special train, leaving at eleven at night. On Wednesday, the 23rd, the sectional sittings commence at ten o'clock, and conclude with a general review of the results arrived at. The rest of the time will be spent in festivities and excursions. At two o'clock a banquet takes place in the Palm Gardens. At five p.m. there will be a *corso*, or festive procession of carriages through the city of Hanover to the suburb of Herrenhausen, till recently the residential palace of the kings of Hanover. At nine in the evening the members will be entertained by the Artists' Club, and in various other places in the city. Thursday, the 24th inst., the last day of the Congress, will be devoted to a grand excursion to Bremen and Bremerhafen. The special train leaves Hanover at six o'clock in the morning, arriving in Bremen at half-past eight, when breakfast will be served in the restaurant attached to the railway. The members will then divide into two bodies. The architects will inspect the chief new public and private buildings of this important Hanseatic port, ander the guidance of the Bremen Architects' Club, who will entertain them in the city. The engineers will proceed to the outlying ports of Geestemünde and Bremerhafen, where they will inspect the important new works on the docks and quays. At half-past two they will take luncheon at the Logirhalle, returning to Bremen at half-past three. At five o'clock both sections of the excursionists will re-assemble at the railway station, and will proceed for a drive through the city. At half-past seven they will be entertained at a final banquet at the Artists' Club, after which they will spend a convivial hour in the celebrated Rathskeller of Bremen Town-hall, returning to Hanover at midnight. We have entered thus minutely into the programme of this meeting, because we think it cannot fail to be of interest to English architects to know how their German contemporaries conduct their Annual Congress. There is a happy mixture of festivity and business which can hardly fail to make such a reunion one of the most agreeable character.

DR. SCHLIEMANN'S NEW EXCAVATIONS AT TROY.

The wife of Dr. Schliemann, a Greek lady, who is an intelligent and enthusiastic assistant of her husband in his archæological researches, has just described in a letter, addressed in Greek, to the Athens journal *Hestia*, some of the results of that explorer's latest excavations on site of ancient Troy. The writer says, "Close to the spot which we consider to be the site of Troy there are the remains of two buildings, which, in the opinion of our two architects, Dr. Dörpfeld and Herr Ofler, represent two temples. The appearance of the two buildings is so different that they cannot be said to resemble any of the well-known ancient temples with the exception of that of Hera at Olympia. This, according to Pausanias, was erected probably about 1100 B.C. The first of our two temples at Troy is 30 mètres in length and 13 mètres in width, while the walls are 1·4 mètres in thickness. The other temple is 20 mètres long and 7 mètres broad, the walls being 1·2 metres in thickness. It is noticeable that the walls are built in a different manner. In the first there are no joinings of clay, but in the second there are large commissures filled with clay, which is also slightly burnt. The inference is that the two temples were built at different periods, and that that first described is older than the second. As I have above mentioned, the breadth of the first temple is 13 mètres and the length 30 mètres, it is scarcely credible that the roof could be solid and without any supports, though of the latter, at any rate, there is nothing now to be found. Throughout the entire "Iliad" of Homer we find no mention of such supports; while in the "Odyssey" where they are spoken of they are described as being of wood. Assuming now that there had been wooden supports in the first temple, they could not have stood on a floor of clay. There must have been a stone foundation beneath them; yet nothing of the kind is now to be discovered on the spot. The internal arrangement of these temples is very interesting. They both have a forecourt on the south-west side. In the first temple this is 13 mètres long and 10 mètres wide. It is separated from the sacred part by two high walls, forming a majestic entrance. In the middle of this sanctuary there is a circular layer of clay 4 mètres in diameter and 0·6 in thickness, upon which, probably, a seated image was placed. Close to the two temples, in the north-east, there is a third temple which, so far as concerns the style of its construction, is like the two others. It has a forecourt, and it seems was surrounded by a corridor. Our two well-informed architects think that these three buildings were temples; but my husband thinks, since they present great similarity to the houses mentioned in the "Iliad" (VI. 316), that they really were only houses, and that they were perhaps built, by command of Paris, by the best architects of the Troas. In this city, destroyed by fire, we see Pergamos with its splendid edifices, that being, according to Homer's description, the same as sacred Ilios. Of gold articles we have here found but few, among them being a very thin diadem and a set of earrings, which are of the same sort as those we dug up some years ago. The nails we have here met with appear to be of quite a different description. They cannot possibly be taken for keys. We have also found some vertebræ, bolts, and spindles, as well as vessels with owls' heads. None of these objects, however, have any great value. The most valuable of all our discoveries is to be found in the three temples or houses themselves, which are quite novel in their style of construction. It is perfectly established that the Troas of Homer was situated at the spot now called Hissarlik, as my husband contended some years ago. Through the kind intercession of the German embassy at Constantinople we also received permission to conduct a series of excavations at Bunabarsi, which some philologists still think was the site of the Homeric Ilios. This place is three hours' walk from the Hellespont. At that place, too, we found bolts and Greek vessels as in Hissarlik. We believe that that place was the site of the ancient Gergi, which at one time is said to have had 2,000 inhabitants."

THEATRES ABROAD.

The catastrophes of Nice and Vienna have led to official examinations in several parts of the Continent as to the safety of theatres in their present condition. Amongst the improvements being made for the purpose of greater security are the extensive alterations in the internal construction of several leading Hamburg theatres. At the Carl Schultze Theatre two massive stone staircases have been added to the previous accommodation in this respect. They are each 6 ft. 6 in. wide, with an easy ascent, and lead to doors capable of affording nearly instantaneous egress to a large number of people. The stage is cut off from the auditorium, the iron curtain being so arranged that it can be let down in a few seconds by even one man, and iron doors are so placed as to shut off the stage from the dressing-rooms, &c. The cloak-rooms have also direct egress into the open air, so that under no circumstances should any stoppage of the means of egress be occasioned, however quickly the audience should be leaving the building. In order to avoid the dangers incidental to stoves behind the scenes, the hot-water system of heating is applied to that as well as to the other parts of the house. The stage and the body of the theatre have separate gas communications, the gas meters being outside the building in each case. There has been in some parts of the house a reduction of the number of available seats, in order that the circulation of the audience may be less impeded. There is a fire-telegraph on the stage, and the system of hydrants is on the most complete scale. The auditorium and refreshment-rooms are being completely renovated against the re-opening, which takes place on September the 1st.

The Thalia Theatre at Hamburg has been provided with a new iron curtain, the trials of which have been eminently satisfactory. Its light weight (30 cwt.) contributes to the ease of its working. The curtain is not left in its rough state (as is done in some instances) but is artistically painted.

The Stadt Theatre is also getting a new iron curtain, and the works at the Variété Theatre are stated to be in a very forward condition, so that its opening has been fixed for the 15th inst.

A new theatre is projected in Warsaw to replace the present small building which has been sold to be transformed into a market. The plans are ready and the site has been presented by the municipal authorities. The cost of the work is estimated at upwards of 30,000*l*.

The Theatre de los Recreos Matritenses at Madrid (destroyed by fire about a month ago), is described as having been a structure which by no means fulfilled the requirements as to safety now so universally admitted as being necessary. Some neighbouring buildings were also destroyed. No doubt this occurrence will cause official attention to be still more closely directed in Spain to the protective measures which have been found necessary in other parts of Europe. In this instance the theatre had

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been, it seems, disapproved of by the authorities.

Some further particulars have been received of the burning down of the theatre at Montevideo on the 11th of June last. The occasion was a festival performance in honour of a former resident in the country, the departed hero of Italy, General Garibaldi. The *Imparcial* now reports that not only was the theatre entirely destroyed by the conflagration which took place on that day, but that there was likewise a terrible loss of life. No fewer than twenty-one persons were burnt or crushed to death in the fatal stampede, while as many as 103 of the spectators received burns or other injuries of a more or less severe description.

THE ARCHITECTURAL ASSOCIATION'S THIRTEENTH EXCURSION.

The Architectural Association's excursion this year will be to Kettering and neighbourhood, and will commence on Monday, August 14th, and terminate on Saturday, the 19th. The President, Mr. Edward G. Hayes, will generally conduct the excursion, and the various buildings visited will be described by him, by Mr. James Fowler, by Mr. J. A. Gotch, and by other gentlemen. The head-quarters of the excursion will be at the Royal Hotel, Kettering.

On Monday, August 14th, Oakham (Church, County Hall, &c.), Burley-on-the-Hill (Hall), Exton (Church and Hall), Wing (Church), and Lyddington (Church and Bede House), will be visited.

For Tuesday, the 15th, Loddington (Church and Manor House), Rothwell (Church, Market, and Manor Houses, &c.), Stoke Albany (Manor House), and Wilbarston (Church), are on the programme.

On Wednesday, the 16th, visits are to be paid to Warkton (Church), Weekley (Church and Hospital), Boughton House, Geddington (Church and Cross), Newton-in-the-Willows (Church), and Rushton (Hall, Church, and Triangular Lodge).

On Thursday, the 17th, Drayton House, Lowick (Church, &c.), Lyveden ("Old and New Buildings"), Brigstock (Church, Manor House, &c.), will be visited.

Friday, the 18th, will be spent in visiting Rockingham Castle, Gretton (Farmhouses), Kirby Hall, and Stanion (Church).

On the concluding day, Saturday, the 19th, the members will meet at the Old Church at half-past nine, and after luncheon at the Royal Hotel the party will break up.

Mr. C. R. Pink, of Castle-hill, Winchester, is the hon. sec. to the Excursion Committee.

OVER-BUILDING IN THE METROPOLIS.

Among the items in the report which was read at the annual meeting of the shareholders in the Northern and Eastern Suburban Industrial Dwellings Company, held last week at the offices, in Finsbury-pavement, reference was made to the over-building which had been going on all round London, leading to a falling off in the income of the company from rents during the year. In consequence of this falling off, the directors recommended that a dividend at the rate of 5 per cent. only be declared. In moving the adoption of the report, the chairman observed that the shareholders of that, as well as those of other companies which dealt with property were aware of the large amount of over-building which had been going forward in various directions around London during the past year or more. Hence the company found that it had not been so easy to let their houses as formerly. Tottenham had suffered in this respect like other districts, and in order to keep their tenants the company had reduced their rents, which accounted for the decreased income during the year. He added, however, that they had one satisfaction, and that was, that their estates were better occupied than many others in the same locality, and in other neighbourhoods. During the last few months their lettings had been considerably on the increase. He believed the depression from which they had suffered was but temporary, and that they were passing through one of those periods of fluctuation that all estates had to experience at one time or another. The directors had not engaged in any new purchase during the year. The cottages that were now nearly completed under the last contract were about being taken over, and beyond that the company only had a small portion of freehold land, which they would probably let or sell. A dividend at the rate of five per cent. was declared in accordance with the recommendation of the directors.

HOLBORN FIRE BRIGADE STATION.

A stately building erected in Bloomsbury by the Metropolitan Board of Works, to supersede the Holborn Station of the Metropolitan Fire Brigade, is now completed. It occupies a good position, and has an unobstructed approach and "get out,"—an exceedingly important matter in a building devoted to such uses.

The piece of ground upon which the station is built is irregular in form, and is open all round. The principal front faces Hart-street, close to the intersection of that street by Southampton-row, near the south side of Bloomsbury-square, and at the point where Hart-street runs into Theobald's-road. Orange-street, leading from Hart-street to Red Lion-square, is on one side of the building, Theobald's-road on the other, the rear boundary of the buildings and yard being in Drake-street. It may thus be seen that, by Hart-street, Southampton-row, and Theobald's-road, there will be ready access to Oxford-street, Holborn, Gray's-inn-road, and thoroughfares leading to all parts of London. There is a wide open area on the west front of the station.

The station has a total frontage of about 340 ft. The principal features in the west front are an effective gable, with a large three-light window, and a square tower 80 ft. high; on the ridge behind the gable is a tall *flèche*, covered with lead, that crowns the ventilating-shaft. From the top of the tower the view commanded is, practically, over all London, and if a conflagration is considerable, and either the fire or smoke proceeding from it can be seen, the men will know, before they start, by what route they are likely to reach it soonest, and be comparatively independent of directions on the way. The front to Theobald's-road is curved and scarcely secondary in effectiveness to the entrance elevation.

The foundations are about 20 ft. below the ground-level, and upon concrete laid upon the natural gravel. Some rubbish, but no "made ground," had to be removed. The principal wall is 3 ft. thick at the bottom diminishing upward. The walls are on concrete all round.

The building has a basement, and four floors over it. The basement is used for stores of various kinds. The establishment, for whom accommodation is provided, embraces two engines (room provided for four), thirteen married and four single men firemen, and one coachman, two fire-escapes, one curricle carrying apparatus for extinguishing chimneys on fire, four horses with stabling, fodder store, &c. The engine-room is 34 ft. by 27 ft., and has two entrances, each 9 ft. wide, with segmental heads. It is lined with enamelled bricks, and is a good example of that kind of work. It has three courses of blue Staffordshire bricks at the base, followed by six courses in chocolate colour; a dado, of 2 ft. 6 in., in buff, and a string of brown, above which the bricks are white enamelled. A watch-room, 15 ft. by 14 ft., adjoins the engine-room. This room has means of telegraphic communication with all the fire and police stations of London. On the first floor the officer in charge has three rooms; the remainder of that floor, and the second and third floors are appropriated in pairs of kitchens and bedrooms for the men. Each of the kitchens is provided with a dresser, cupboard, and sink. There is a washhouse, fitted with coppers and troughs, at the top of the building, and the coachman's house and stables, in the rear of the main building, are roofed flat, and asphalted, providing an area of 800 ft. super. as laundry drying-ground. The ventilating shaft is utilised for drying the hose after service. They are suspended loose from the top of the shaft.

The principal external walls are of Teynham red bricks, and the copes, sills, facings, and dressings, of red Mansfield and Portland stone; the walls have a plinth, 3 ft. deep, of blue Staffordshire bricks. Two friezes of ornamental bricks are carried round the walls between the floors. The walls stand 40 ft. above the ground level, and are finished with a cornice of red Mansfield stone. The high-pitched roof is covered with Broseley tiles, and crowned with a ridge of the same material. The dormers, clustered chimney-stacks, and gables are very effective features in the elevations.

The building is from the designs of Mr. George Vulliamy, Superintending Architect of the Metropolitan Board of Works; Mr. Estall is clerk of the works; Mr. C. W. Reading, of Pimlico, contractor; Mr. Thrush, contractor's representative.

A PORTION OF THE PRINCIPAL ENTRANCE, TARRAGONA CATHEDRAL.

The Cathedral of Tarragona, of which we have gathered a few particulars, is considered to possess much interest on account of the history of its foundation and its antiquity. It was commenced in 1124 by St. Olaguer, and in 1282 Archbishop Olivella added to it the present baptistry chapel and the existing central portion of the front in the Romanesque style, and which, it is supposed, was formerly the door from which entrance was gained by the cloisters. The central part of the front contains, amongst other works of the sculptor's art, a large carved rose and a terminal in the upper portion, and in the lower a projected gallery of four pointed concentrical arches, resting on eight dosserets devoid of pinnacles, surmounting as many gigantic statues of apostles and prophets placed in an array facing those dosserets and statues set in their turn on buttresses terminating in needle-like pyramids and flanking the entrance. This gallery rests upon a base of small ogive arches and pillarets.

The lintel, cut of one block of marble, measures 22 ft. 4 in. The pillar supporting it in the centre is 19 ft. 5 in. high, and is surmounted by the image of the Virgin. The jambs of the portal are solid pieces of marble, and profusely carved throughout. The tympanum is open-work, filled with stained glass, containing the figure of Jesus, seated between the sun and moon, with hands raised, blessing two angels in the act of worshipping. The frieze represents the resurrection of the body through a series of sepulchres giving forth their dead at the sound of trumpets blown by angels, and between them and the lintel are displayed the torments suffered by the wicked. The figure of the Virgin, upon the pillar which divides the porch, is an interesting work, its most attractive features being the arrangement of the drapery, the necklace, and its graceful attitude. The image is slightly mutilated. The figures of the apostles and prophets, like the figure of the Virgin, are of white marble, nine of them being by Joan Bartomeu, and the others by Jaume Castails. They were completed in 1375. There has been want of skill in placing them, and which has failed to insure their perfect preservation. It is a popular tradition in Spain that each century has dislocated one statue, but matter-of-fact history does not appear to bear out tradition. The large doors which close the porch are of oak, strongly lined on both sides with iron of a floral pattern, and adorned with locks of splendid finish, making the whole decoration look more like needlework than the handiwork of the smith. The whole is a valuable specimen of the locksmith's art, and was executed at the expense of Archbishop Don Gonzalo Heredia (1510). We give an illustration of a portion of the porch.

Monument to Sir E. Landseer.—A mural tablet of marble, sculptured by Mr. Woolner, has been placed about twenty paces from the grave of Sir Edwin Landseer, in a bay on the south side of the crypt of St. Paul's Cathedral, in which is John Rennie's tomb, and next to that where Sir Christopher Wren was buried. In the upper part of the monument is a medallion portrait in profile, supported, as it were, by corbels,' on which appear copies of the heads of the lions in Trafalgar-square. Above the medallion is a moulding enriched with fern-leaves, and over this a painter's palette and brushes. The lower part of the monument is a bas-relief from one of the painter's works,—"The Shepherd's Chief Mourner." Beneath, on a bracket, is the family crest,—the head of an eagle holding a key in the beak. The inscription, in small incised and gilded letters, reads:—"Sir Edwin Landseer, R.A., son of John Landseer, A.R.A. Born March 7, 1802. Died October 1, 1873. This monument is erected by his surviving brothers and sisters. 'He hath made everything beautiful in his time.'"

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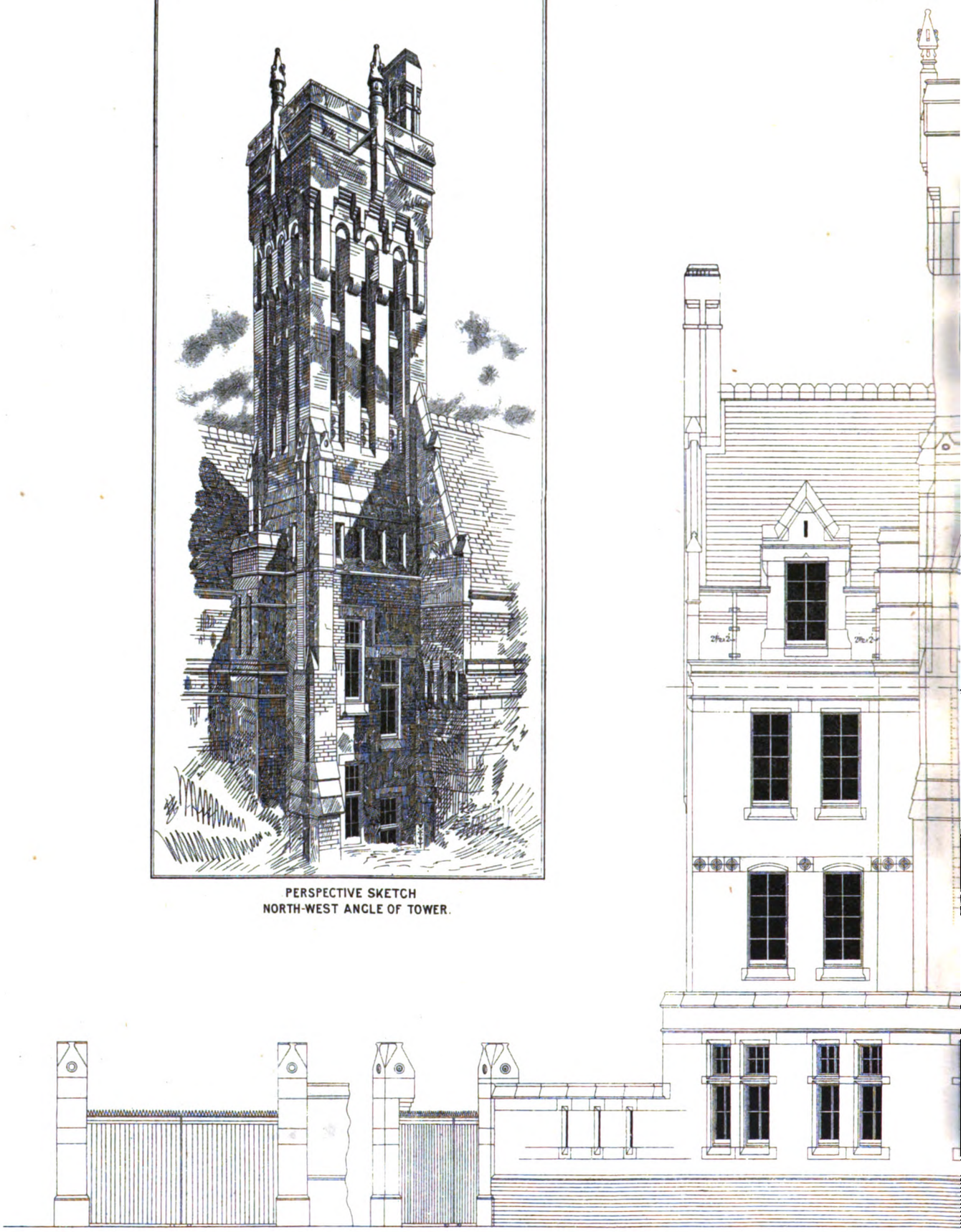
PERSPECTIVE SKETCH
NORTH-WEST ANGLE OF TOWER.



TRUE ELEVATION OF
YARD GATES.

Whiteman & Bass, *Photo-Litho* 236, High Holborn.

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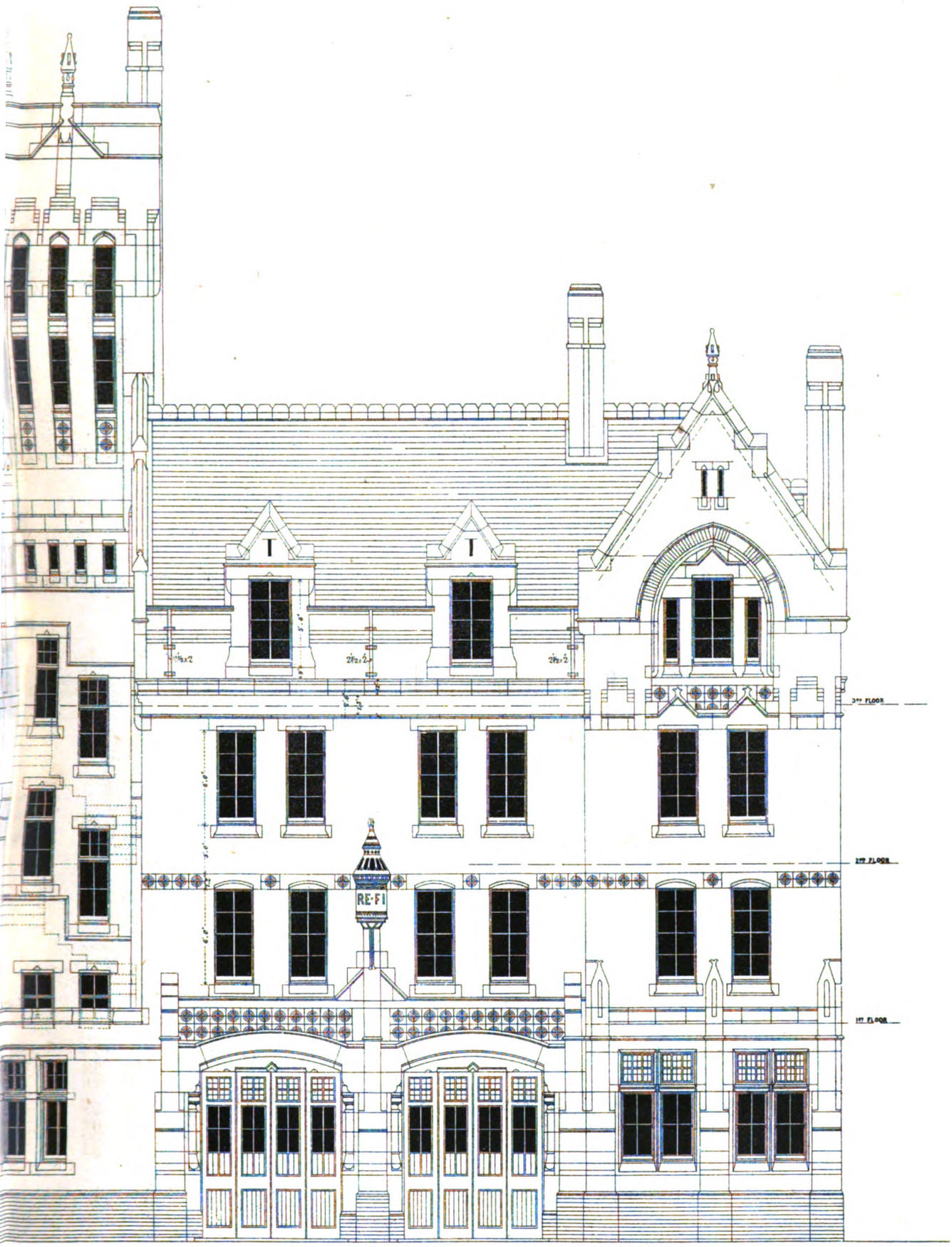

FRONT ELEVATION

SCALE OF FEET.

Wyman & Sons, Printers, 74 Queen St

HEOBALD'S ROAD, HOLBORN.

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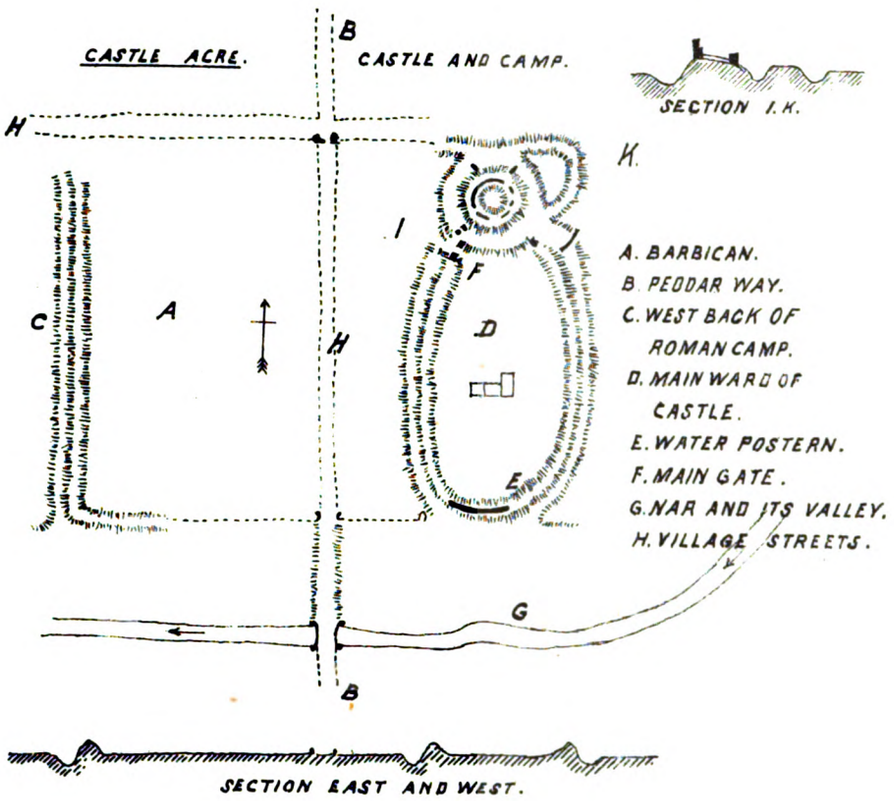

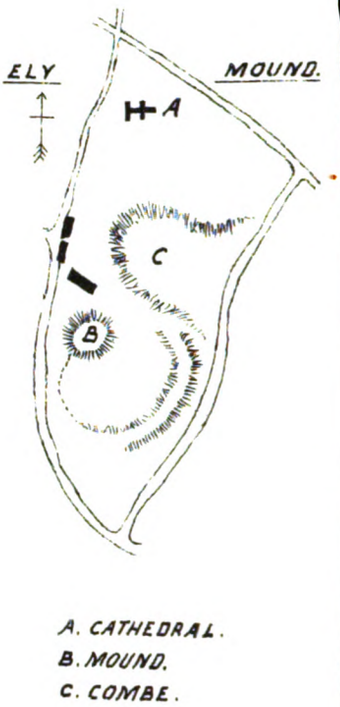

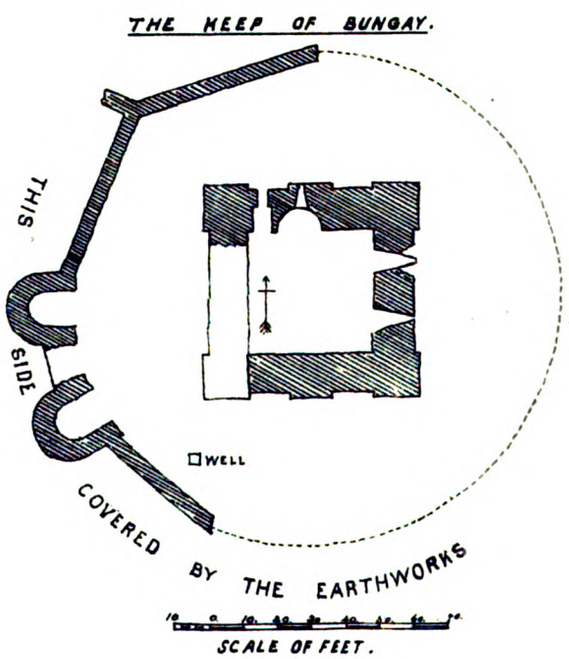

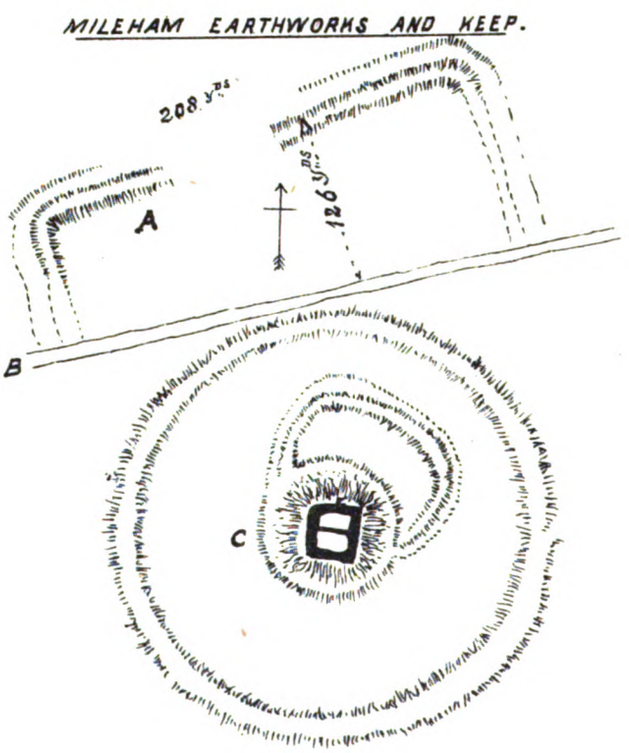

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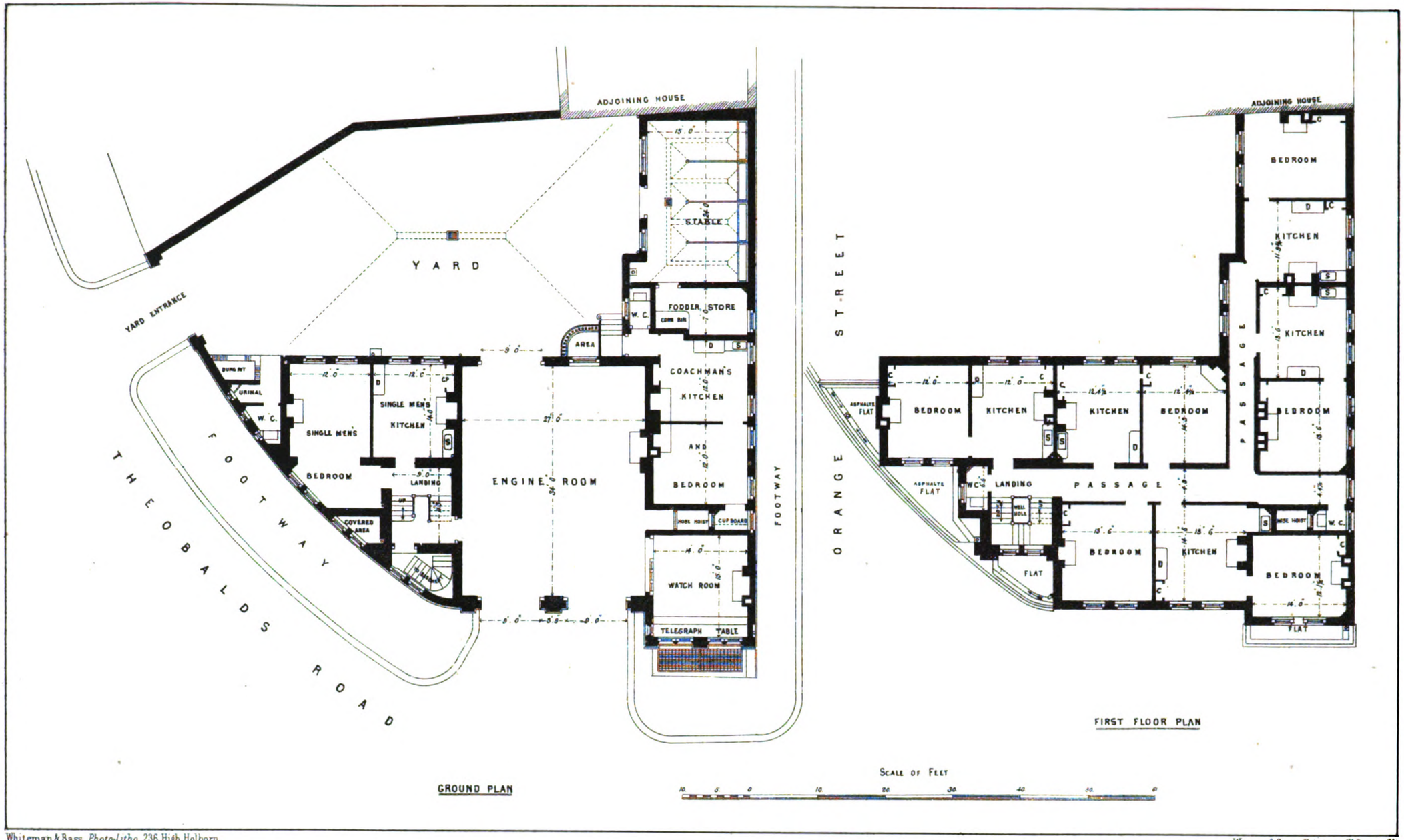

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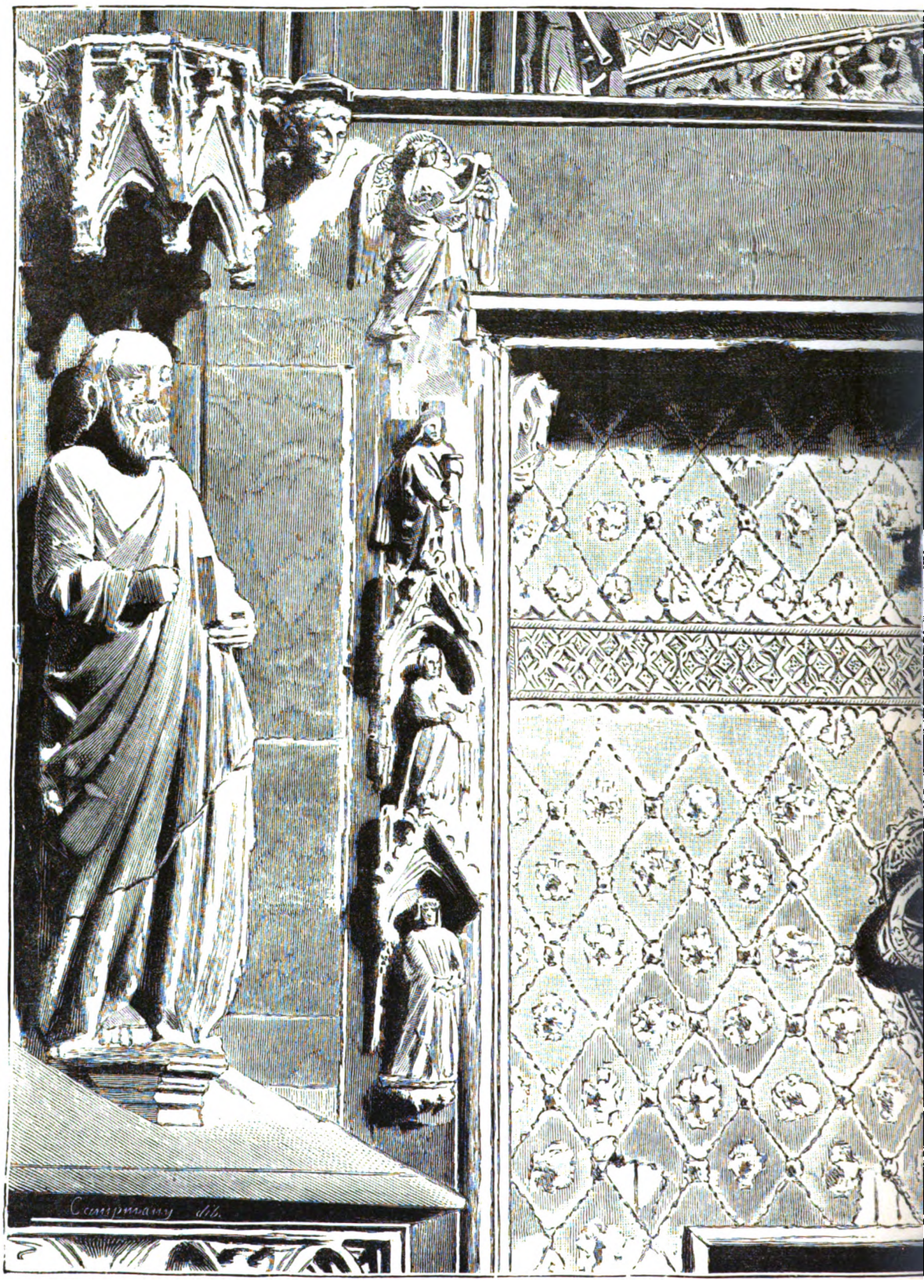

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ON SOME EAST ANGLIAN EARTHWORKS.

CASTLE ACRE, ELY, MILEHAM, BUNGAY.

BY G. T. C.

CASTLE ACRE.

Castle Acre, the castle on the cultivated land, the Acre of Domesday and the succeeding century, is a place of some historic and very great archæologic interest: historic, as a strong castle of the great Earls of Warren, and archæologic because its earthworks are on a large scale and of a composite character, concerning the date and origin of one part of which there has existed great difference of opinion.

Castle Acre stands upon sloping ground, on the right or north bank of the river Nar, which there flows down a broad and rather steep-sided valley, across a meadow of irregular breadth, which at one time must have been an impracticable morass, and is now irrigated as a water-meadow. The village is placed upon the Peddar-way, a road, the directness of which indicates a Roman origin, and which leads from Norwich to Castle Acre, and thence, twenty miles in a straight line, to Holme, on the Wash, where is a small Roman camp, and near to which was Brannodunum (Brancaster) a well-known Roman station.

It is evident that the original encampment was a Roman work upon the Peddar-way. Much of this remains, and a part of it is little changed. It was in plan roughly rectangular, about 350 yards north and south, by perhaps 420 yards east and west, but its southern side being governed by the course of the river, is irregular, and the eastern side may have been somewhat shorter than the western. The western bank is the most perfect. It is steep and straight, about 12 ft. high on its inner and 20 ft. on its outer face, which is guarded by a deep and broad ditch. It is formed of chalky gravel, very firm, and extends from the village street on the high ground down to the margin of the river-meadow. At the lower end it turns parallel to the river, eastward, nearly or quite at a right angle. A few yards at the upper end are wanting, having been levelled for the formation of the village street. It is evident that the north bank lay along the course of the present street. At its west end it has been levelled and its site built upon, but toward its east end a part remains, though somewhat altered, and near, or quite in its centre, a later gateway, of about the reign of Henry III., marks the place of the original entrance, exactly on the line of the Peddar-way.

Opposite to this, in the centre of the southern face, are traces of another gateway, denoting the original southern entrance, and in front of this a causeway, and at present a bridge, carrying the road which points to Norwich and to the Roman Castor. The eastern bank of the camp remains, but has been altered considerably, and somewhat diverted by later operations. This was the Roman encampment, placed, as was not unusual, on a sloping ground, with one side to the river, which also, curving northwards, covers, to some extent, the adjacent end. There is no trace of Roman masonry, nor have any considerable Roman remains been found here. Probably the camp was used to protect the party engaged upon the construction of the road, and this made, it ceased to be of importance.

The western half of the camp, that west of the Peddar-way, seems to have been left unaltered; but the eastern part has been so altered as to present traces only of its former condition. In its north-eastern quarter has been dug a large and deep circular ditch above 180 yards diameter, and 30 ft. to 40 ft. deep. The contents of this ditch having been thrown inwards, form a conical mound 25 ft. to 30 ft. high, and 40 yards across at its table-top. This top, however, is not level, but slopes considerably towards the south-east, falling as much as 15 ft., as the ditch also falls; this makes little or no difference in the height of the mound, measured from the bottom of the ditch. This, the proper ditch of the mound, coincides at its northernmost point with the general line of the north bank of the encampment. From the outer side or counterscarp of the ditch at the north-west quarter, is seen a trace of a bank and ditch, passing westward, which no doubt are a part of the defences of the old camp; and opposite, to the north-east of the mound, is a sort of triangular work placed on the outer side of the ditch of the mound, and having a ditch of its own which communicates at either end with the circular ditch. This earthwork is, very evidently, the original north-east angle of the camp, somewhat altered to accommodate it to the later castle. These two outworks cover very nearly the northern part of the mound. Towards the south is a much larger area, forming the principal ward or court of the new fortress. This is enclosed within two very broad and lofty banks which spring from the outer edge of the circular ditch at about 80 yards apart, covering about a fifth of the circumference of the mound. These descend southwards and are slightly rounded so as to meet in a flattish side upon the river bank, and thus include an area about 100 yards east and west by 110 yards north and south. Outside these banks is a ditch of great depth and breadth, communicating at its northern ends with the ditch off the mound, and at its southern part dying out, being replaced by the steep bank of the river meadow.

It will be evident from the above description that we have here a burh such as Queen Æthelflaed threw up at Tamworth in 913, or as was formed in 921 at Towcester by Eadward the Elder, and such as was in common use among the Northmen, whether Angles, Saxons, or Jutes, in the tenth century, and probably much earlier. In this instance, as at Tamworth and many other places, the simple burh with its court or courts is complicated by the wish to turn to account an older earthwork. Here not only the two northern projections from the burh represent parts of the older camp, but also the eastern bank of its main court evidently represents the eastern bank of the encampment.

Mr. Harrod, one of the latest and most clear-sighted of East-Anglian antiquaries, takes, I am aware, a different view. He supposes the burh and its appendages to be the earlier work, due to the Britons, and the rectangular encampment to be later, modified by its Roman authors to suit the British defences. The question is an important one, since it bears upon nearly all the more considerable East-Anglian earthworks, besides many others in other parts of England and in Normandy.

Whatever may have been the origin of these earthworks, they were certainly occupied in East-Anglian times. Acre, under the Confessor, belonged to Toche, and was granted by the Conqueror to William Earl Warren, with a very large Norfolk property. What the earl found at Acre, beyond the earthwork, in the way of defences, is unknown; probably a timber structure, defended by strong palisades. He at once made it his chief Norfolk seat, proceeded to improve its defences, and, before the death of his wife in 1085, founded a priory for Cluniac monks a little lower down the river. The parish church, mentioned in Domesday, he gave to the Priory at Lewes. Also, he either found or established a chapel, with monks, within the castle, which was afterwards transferred to the new Priory. The first earl died in 1089. Possibly he began the castle; but it is scarcely probable that he lived to finish both that work and the Priory. Probably both were completed by his son, the second earl.

The first step was to establish a shell-keep upon the mound. This was a wall irregularly circular within, and irregularly polygonal without, and each angle was capped, after the Norman fashion, by a broad flat pilaster of about 6 in. projection, of which several remain. The wall was about 7 ft. thick and 12 ft. high inside to the rampart walk, outside it was carried 20 ft. or more, lower, as a revetment-wall, so that it there appeared full 30 ft. high. Much of this wall remains, on one side about 90 ft.; and in its northern part is an oblique passage, probably a gard-robe. The central part of the area is at present hollow, as though foundations had been removed. Mr. Harrod describes the keep as divided into two parts, with steps leading up from the lower or eastern part to the other. In the upper half he found the foundations of a rectangular tower, 50 ft. by 40 ft., with walls on one side 5 ft., and on the other 13 ft. thick. These would be about the dimensions of a small keep. But a rectangular keep upon a mound is unusual, and upon a mound within a shell-keep unheard of. At this time there is no visible trace of either steps or tower. From the wall of the keep three if not four walls radiated down the slope across the ditch, and thence were continued along the centre or ridge of the earth-banks, so as to include the two courts, and probably along the northern bank westward as far as the main and outer northern entrance. These walls not only protected the several wards, but prevented the besiegers, who might have gained the wards from circulating along the ditch of the keep. Of the wall of the south ward a considerable fragment remains towards the river, and there are indications that it extended as far as the south gate. It is sufficiently clear that the castle area included the whole eastern half of the Roman camp, the wall running from the north to the south gate, and including the road between them. This accounts for that part of the present village being still called the Bailey. The western half of the camp is called with less propriety the barbican, inasmuch as it cannot be said to have covered the entrance.

The entrance to the main ward was at its north-west corner, where its curtain joined the counterscarp of the ditch of the mound. Here are remains of a gatehouse which, in 1781, was flanked by two drum towers; and it is probable that here was the way to the keep by a flight of steps, as at Cardiff and Tickhill, built against the cross wall of the ditch. In front of this gate the main ditch is crossed by a causeway, which, no doubt, takes the place of a drawbridge. There may also have been a gateway at the opposite or north-east corner of the ward leading into the triangular ward. There also remains a fragment of a wall crossing the ditch between the main and the triangular ward, but this wall is far too slight to be of Norman date. In the main ward are traces of foundations,—probably of the hall, chapel, and lodgings. Besides the gateway into the south or main ward, the outer ward or bailey was entered by a north and south gate, corresponding to the entrances of the original encampment. Of these the north gate remains, and is a poor specimen of Early English or Early Decorated work. The gateway has a high Pointed arch, between two small half-round towers. The rest of the building and the lateral walls are gone. No well has been discovered in the castle; probably there were several, water lying at no great depth. Blomfield quotes from a charter of Stephen the signature of a witness as "Geoffrey de Balio, *ante portam castelli*." This refers to the inner gate, and shows that even then the space between the inner and outer gates was known as the Bailey.

Earl Warren's castle, though a formidable fortress, was not destined to stand the brunt of war; at least, there is no record of its having been actually besieged. The male line ended with the third Earl, whose daughter and heiress carried the castle, first to William of Blois, a natural son of King Stephen, who died childless in 1160; and, secondly, to Hameline Plantagenet, a natural son of Geoffrey of Anjou, who died 1201. Both husbands bore the title of Earl of Surrey, which Isabel's descendants by Hameline continued to bear until 1347, when Castle-Acre passed with an heiress to the Fitzalans, Earls of Arundel and Surrey, whose heiress married a Howard; but just before the change Castle Acre was sold to Sir Thomas Gresham, who probably was attracted by the fact that the advowson of the church of Gresham was held to be a member of the manor of Castle Acre. It had for a long time been a mere ruin. In 1347 the herbage in the castle ditch was valued at 5s. per annum; 300 acres of arable land at 75s. 3d.; 8 acres of meadow at 12d. per acre; 15 acres of pasture at 4d. per acre; rents of assize at 13*l.* per annum; market and fair at 13s. 4d.; pleas of court at 60s. Grose gives a view of the keep taken in 1772, which shows the walls in a far more complete state than at present. The north gateway, which he also gives, is but little changed.

Edward I. was at Castle Acre several times, and finally in 1297, but whether he lodged at the priory or in the castle is unknown.

The castle is mentioned in 1135 in a charter by the second earl.

THE MOUND OF ELY.

Ely, or Elye, is described by Bede as a sort of island girdled by marshes or by waters, and deriving its name from the abundance of eels taken therein. Eels, indeed, may well have abounded in the sluggish and muddy waters by which Ely was formerly surrounded, though its present aspect is by no means suggestive of "moorish fen," or marsh ague. It is, or was, evidently enough an island, but it rises more than 100 ft. above the Fen level, and the ascent to the village-city is both long and steep. The surrounding fens and meres, now drained and

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cultivated, are separated from the centre of the isle by moderately high ground extending for considerable distances, and the bed of clay which forms its base is capped by a thick layer of dry sand and gravel.

A spot so advantageously placed for residence and defence must have been inhabited by the earliest settlers in that side of the country, and its value must have been much enhanced by the invasions to which the district was subjected, probably both during and before the Roman conquest, by those who gave name to the Saxon shore. The British Iceni had their capital on the hill of Norwich, and although their traces there or in the eastern shires generally, are very slight and scanty, Ely was, no doubt, occupied by them, and some of the more irregular of the raised roads or causeways connecting the higher lands and smaller islands of the Fen are supposed to be their work.

Under the Romans the station at Caistor separated the "Vesta Icenorum," and from thence roads radiated to Brannodunum (Brancaster) on the Wash, to Durobrovæ (Caistor) on the Nene, to Cumboritum (Cambridge or Granchester) on the Cam, to Camalodunum (Colchester) on the Coln, and to Sitomagus (Danwich), and Garianonum (Yarmouth or Burgh) on the sea-coast and at the mouth of the Yare. The great Akeman-street ran past Ely, and numerous rectangular earthworks, more or less obliterated, and with here and there fragments of Roman masonry, show the occupation of the territory from the Thames northwards to the Wash to have been complete.

It was the possesion of those Roman works that enabled the post-Roman Britons to make so gallant and long-continued a resistance against the freebooters from Engleland, and it was not till the middle of the sixth century that the Gyrwas, as they called themselves, gained full possession of the Fen country north and south of the inlet of the Wash. Of the Suth-Gyrwas, or that south of the Wash, Sudbury was probably the southern, and Norwich the northern, capitals, but Ely was certainly a place of importance, and the centre of a considerable private estate, as appears from what is related by Bede of the foundation of its earliest religious houses.

Towards the middle of the seventh century, Tunberht, "Princeps Australium Girviorum," an East-Saxon ealdorman, was the possessor of a large domain, of which Ely appears to have been the "caput," and which, upon his death, came to his widow, Æthelthwyth, daughter of Anna, king of the East Angles, who became the wife of Egfrid, afterwards king of Northumbria, and who founded a monastery at Ely before her death in 679. This monastery, which attained to a great reputation, was destroyed utterly by the Danes in 870, and again founded in 970. A second, or, perhaps, a third foundation, took place about a century later, and here the celebrated Byrhtnoth, who fell in the battle of Maldon in 991-3, was buried, having already given a large endowment to the church. Probably both Tunberht and Byrhtnoth had a residence at Ely, and there is but one place where this could have been situated; upon the large moated mound a few yards south of the church and within the precincts of the land conveyed to the monastery. This burh is thought to be that designated in Eligbyrig, one of the East-Saxon names of Ely, though it is held that byrig is usually applied to a collection of huts or houses, burh to a fortified mound. However that may be, there can be little doubt that the burh, which still remains, and is the property of the Dean and Chapter of the church, was the private residence of some great East-Saxon thane, at least as early as the beginning of the tenth century if not much earlier. That the burh is Saxon, that is, neither British nor Roman, is evident from its aspect and details.

This mound is a very distinguished feature in the place, and occupies the summit of one of the two natural summits of the isle, the other, a short furlong to the north, being covered by the cathedral. The mound is, as usual, a truncated cone, partly artificial, and placed upon the top of a natural hill. It is not above 40 ft. high, though said to be 120 ft. above the Fen level. Its table summit is 70 ft. diameter, but its slope is a less steep angle than usual, probably from the looseness of its material. Its base, therefore, covers a very considerable area.

As the ground to the east falls rapidly from its base, a ditch was scarcely necessary, but to the north the ground is high, and the ditch was probably deep, though, as the ground here is partly built upon and partly enclosed and laid out as a garden, it is impracticable to examine it closely. Probably the ditch, having long been unneeded as a defence, has been filled up. The court or area appended to the mound was of large extent, and lay to the south, on the sloping ground. It was included within a bank and an exterior ditch. The bank commenced on the north-east side of the mound and ended upon its south-east side, including rather more than half of the circumference, so that the mound, as at Castle Acre, formed part of the exterior line of defence. Between the mound and the cathedral is the head of a deep comb, which there commences and descends, opening towards the east. At this time the abbey barn stands a little to the west and almost upon the skirts of the mound, being built probably in part upon its ditch. A little to the north-west is the great gatehouse, "Ely Porta," in the place, probably, of the original entrance to the burh. The mound has always been the property of the Church of Ely, and is still included within its precinct. It is planted, and its top is reached by a winding walk. Locally it is known as Cherry Hill; but this is supposed to be a modern name.

It is remarkable that, although this mound is undoubtedly a Saxon burh, and intended for defence, it is never called "the Castle Hill," and seems never to have been so used by the bishops. There is no trace of masonry upon or in connexion with it, and it is never mentioned in the records as a castle or a moat, or in any other way. Even Bentham does not allude to it. The pipe-roll of 1st Henry I. mentions the bishop as accounting for certain of his knights who kept his ward in the Isle of Ely, as they were doing for Norwich Castle; but the Isle is not a castle, although it may be that its natural strength was found to make the castle unnecessary. That the burh was not employed as a fortification in the eleventh century is pretty clear from the fact that there is no mention of a castle in the various operations connected with the attack of the Isle of Ely by the Conqueror, and its defence by Hereward and the English in 1069 and 1070. Subsequent records, though they very frequently relate to Ely, make no mention of any castle there; but an inquisition taken in 1229 states the area of the priory close at sixteen acres, and adds that it contained a garden of six acres and a windmill. There can be but little doubt that the windmill stood upon the mound.

MILEHAM CASTLE.

In the northern part of Norfolk, in a district where the names of the parishes mostly terminate in "ham," upon the road between Elmham and Swaffham, or, more properly, between Norwich and Lynn, about six miles east of Castle Acre, is the village of Mileham: so called, it is supposed, from its mill. If this be so, the mill was probably worked by wind power; for Mileham stands high between the sources of the Nar and a tributary of the Wensam, and its streamlets are inconsiderable. Laundyke, or the Devil's Dyke,—no doubt one of the defensive earthworks, named originally from Woden,—runs north and south a little east of the village, gives name to the Hundred of Launditch, and may possibly be connected with its earthworks. This was probably one of the many lines of defence thrown up by the invading Angles to keep back the British Iceni, showing, according to Mr. Green, that there was a period when the former were content to retain what they had acquired, and to act upon the defensive only.

The Mileham earthworks, designated locally by the name,—no doubt, comparatively modern,—of Hall Yards, are somewhat peculiar in figure and fashion. A broad but very low mound, about 24 yards across at the top, and about 12 ft. in height, is surrounded by a light ditch, circular, and about 100 yards in diameter. On the outer side or counterscarp of this ditch, towards the north, is applied an oval, or rather an ear-shaped enclosure, about 120 yards by 80 yards, placed broadside against the ditch of the mound, of which it covers about a third of the circumference. This appendage is protected by a low bank and ditch, the latter communicating with the ditch of the mound.

Outside the works, forming a circle of about 600 yards diameter, is another bank and ditch, also of no great height or depth. The mound is nearly in the centre of this circle, or perhaps a little nearer to its south-west quarter.

In the centre of the mound are seen the foundations of a rectangular building, about 50 ft. square, and evidently the remains of a Norman keep. A cross wall, running nearly east and west, divides the interior into two parts. The material is flint rubble, the walls thick, and their present top a little below the level of the top of the mound. The work is evidently founded upon or below the natural surface of the soil, and probably what now remains was not intended to be seen. The curtain to the outer area is thought to be indicated by a fragment of masonry towards the north, upon the road, which, with the keep, are the only remains. Probably the outer circle was walled, but of this there is now no trace visible.

North of and beyond the road is a bank running in a straight line 208 yards east and west, and turning southward at each end for 126 yards, where it is cut off by the road. There is also an exterior ditch. This, it is evident, is the northern half of a Roman camp, intersected by the road, the southern half of which has been altered and superseded by the earthworks of the castle. It is pretty evident, from the relative position, no less than the character of the two sets of works, that the Roman work is the older, and that the mound and its appendages are later alterations of the fashion of those described in the "Anglo-Saxon Chronicle," and, in short, that we have here, as at Castle Acre, a burh, the work of the East Angle settlers. The masonry, especially the fragment of the keep, belongs to a later age and to the Norman lord.

It appears that Mileham was a part of the extensive private possessions of Archbishop Stigand, and as such was taken by the Conqueror, who held it at Domesday, its keeper being William de Noiers, a person much trusted by William for the care of forfeited estates. Mileham had been the capital manor of a large estate, and, no doubt, the residence of an English lord. Attached to it were several cervites, or sub-lordships, and those of the Hundreds of Launditch and South Greneho, with forty or fifty knights' fees. The property was granted, either by William or Henry I., to Alan the son of Flaald, lord of Oswestry, and progenitor of the earls of Arundel and of the Scottish house of Stewart. Alan, or his son William Fitz-Alan, built the castle, turning the English earthwork to account in the new works, if, indeed, the castle was ever finished. It is remarkable that, although the masonry shows that there actually was a keep, or the commencement of a keep, and although there is reason to believe that a castle was actually built, no mention of it occurs in any known record. Mileham was the seat of an Honour, and the place under which other lordships and many knight's fees were held for many centuries; but the place mentioned is the manor, and never the castle. The Fitz-Alans were powerful lords, and held several castles, as Arundel, Oswestry, Clun, and others, frequently named in their inquisition, but of Mileham Castle nothing is said. The manor occurs in all the later inquisitions down to the time of Henry, earl of Arundel, who sold it, in 1559, to Sir Thomas Gresham, who also purchased Castle Acre.

There was a sub-manor in Mileham called Burghwood, which is said to have given name to a family who acted as castellans to the castle for the earls of Arundel. The father of Sir Edward Coke held this manor, and Sir Edward himself was born at a house within or at no great distance from the castle.

There is a short and very indifferent account of Mileham in the *Gentleman's Magazine*, vol. lxxxix., part i., p. 513, with a pretty good plan and a very exaggerated elevation. Also in the "Transactions" of the Norfolk Archæological Society is an account of it by Mr. Carthew.

BUNGAY CASTLE.

On the borders of Norfolk and Suffolk, just within the latter county, the river Waveney, their boundary from the sea at Yarmouth for fifty miles, to its source near Redgrave, by one of the most remarkable of its many folds, embraces a broad and long peninsula of meadow containing above 400 acres, the neck or isthmus of which is of moderately high ground, and not above 450 yards broad. Completely to secure so valuable a pasture, advantage was taken of the position to throw up upon the isthmus a moated mound, between which and the river the ground is further occupied by a spacious base-court or ward, also protected by

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a lofty earth-bank and a deep exterior ditch. The works gave occasion to, and form the nucleus of, the town of Bungay, and are but a few yards distant from St. Mary's Church. The name of the town is thought to preserve that of "Bunna," its supposed founder: "gay," in East-Anglian nomenclature, is a "gate" or enclosure.

Bungay, under the Confessor, had become a considerable place, containing three churches within its limits and two outside them. The burh and manor had belonged to Godric, but the soke was the private estate of Archbishop Stigand, with much other Norfolk land. William seized upon it as his own demesne, and included it in the immense extent of territory given over to the care of William de Noiers. Soon after domesday, Bungay, with many Norfolk and Suffolk manors, was granted to Roger le Bigot, one of the Conqueror's most distinguished followers. The town itself was valuable, and there were productive water-mills and an important fishery.

Roger, no doubt, found here a strong place, as strong places were then understood in England and in Normandy, and either he or his son inclosed the mound within a revetment of masonry, and in its centre constructed a rectangular keep, a very unusual arrangement. Probably the mound was not considered high enough to form the base of a regular shell keep, and was merely revetted to carry a parapet as an additional defence, containing a sort of small inner ward round the keep. That the parapet, however, was more than a mere breastwork is evident from the height and strength of the two gate towers which still remain, and which, though later than the keep and the original revetment, must have been parts of a circuit corresponding to them in strength.

"The Castle of Bungay,
Hard by the river Waveney,"

became known as one of the strong places in eastern England, and was made much of by the house of Bigot. Norwich, which they often held, was, no doubt, a larger and stronger castle, but Norwich was a royal castle, of which they were but castellans, whereas Bungay was their own.

Hugh, the third baron, was created Earl of Norfolk by King Stephen in 1135, but having changed sides, Stephen attacked and took Bungay in 1140, at Pentecost, as related in the annals of Waverley. On the accession of Henry II., Earl Roger surrendered his castles, which, however, not being adulterine, were restored to him in 1163. Later in the reign, in 1175, the earl, being in rebellion, was defeated in the field by Hugh de Lacy, and his castles of Walton, Framlingham, and Bungay were taken. Walton was then destroyed. Richard I. restored Bungay to Roger, the earl's son, on a payment of 1,000 marks. During the reign of Henry III., Earl Roger was always in opposition and often in rebellion, and Bungay, falling into the king's hands, was destroyed, and appears so to have remained till the reign of Edward I., when, in 1293-4, Roger, the fifth and last earl, had a licence to embattle his house, "Mansum suum de Bungay." On his death, Bungay fell to the Crown, and in 1312, or earlier, was granted to Thomas of Brotherton, the king's fifth son, with the earldom of Norfolk. Edward de Montacute, who married Alice, Earl Thomas's daughter, held the castle as early as 1308, and with it four water-mills and two windmills. Montacute's daughter, Joan, married William de Ufford, earl of Suffolk, and the castle remained in the Uffords till 1381. In 1475, John de Mowbray, duke of Norfolk, had the castle by descent from the Brothertons, and finally it came to the Howards, and Jockey, of Norfolk, who fell at Bosworth, was lord of Bungay. The attainder of Thomas, duke of Norfolk, brought Bungay into the hands of the Crown; and it was afterwards granted by James I. to the Howards, earls of Suffolk. It was afterwards sold, but has been repurchased, so that the castle now belongs to the Duke of Norfolk.

The Benedictine nunnery, of which the ruins remain, attached to St. Mary's Church, was founded by Gundreda, widow of Roger le Bigot, and Roger de Glanville, her second husband.

The mound, motte, or burh of Bungay, stands on the edge of the present town, and is much obscured by buildings, enclosed yards, and gardens, placed against it; it is about 10 ft. high, and about 46 yards diameter on its level top. The original mound was evidently circular, but it has been enclosed all round by a revetment or retaining wall, which is said to be a polygon, and perhaps may be so, though of an irregular character. The parapet appears modern.

In the centre of the area is what remains of the keep. This is a mass of masonry, about 60 ft. square, with walls 12 ft. thick, once, perhaps, faced with ashlar, but now entirely composed of flint rubble, so that anything like close accuracy of measurement is impracticable. What remains is about 12 ft. high, and evidently composed the ground floor or basement; there was no underground chamber. The north and east walls are perfect, and nearly all the south wall; most of the west wall is gone. Each face seems to have been broken by three pilasters, 12 ft. broad, and 1 ft. projection, the flankers meeting over the angles, which are solid. The central pilaster is seen on the north and south faces, but is obscure on the east face. In the east wall are two loops, the splayed recesses of which are 6 ft. broad and 12 ft. apart. In the north wall is a semicircular recess, 13 ft. broad, with a loop. Close west of this is a small modern door, probably representing a loop; there are no openings in the south wall. The entrance was probably in the west face, inside the building; at the two eastern angles, are traces of ashlar.

The well remains open in the court about 18 ft. south-south-west of the south-west angle of the keep. It is about 3 ft. square, lined with rubble, and at present 20 ft. deep and dry. West-south-west of the keep, at about 40 ft. distant, is the gateway of the inner ward. The arch is gone, but there remain two half-round flanking towers, with prolonged sides. They are of 7 ft. internal diameter, with walls 7 ft. thick, and are open at the gorge. They are later than the keep, and probably of the time of Richard I. or John.

The outer or great ward of the castle lay to the south and west, and was evidently contained within a very broad and lofty bank and a deep ditch. The ditch seems to have opened at each end into the ditch of the mound, and to have covered from one-third to one-half of it. Much of the bank has been thrown back into the ditch, and houses built upon the site, but enough remains to show the magnitude and general direction of the whole. There is no visible trace of masonry on the bank, but it must certainly have carried a wall. The earthworks seem to indicate two courts, and there is a gap which may represent the outer gate on the west side.

A BAZAAR IN THE EAST.

Not the East of glowing sun and vivid colouring,—of opalescent sky, of gilded domes, and minarets,—where nature throws such a jewel-tinted mantle over the prosaic and sad attributes of poverty that they become almost poetical and picturesque,—but in that East of our great city, where too often, alas, we meet, in all its unredeemed ugliness, the grim scarecrow of dire distress. It is so often in the interest of progress,—of humanity,—we are obliged to show the darker shadows of the picture, that it is with positive relief and pleasure we exhibit now and then the brighter side.

In this East, a little army of good men and true are (with the same unflinching courage, the indomitable perseverance that animates our soldiers on land, our blue-jackets at sea) waging their war. With no grant from Government, no pomp or pageantry to nerve them to great deeds, no outward applause,—for they are mostly those who "do good by stealth, and blush to find it fame," a reason that prevents me alluding to them by name. They are men honourable in the church, in the medical profession, in the sister services, and there are others also, who, irrespective of position, are all zealous workers in the same good cause; men who, as Mr. Wilson remarked, are all united,—whatever their political opinions may be,—all "true blue," in fact, when the question is for the good of humanity; and they have their unflagging contingents, their ever-ready helpers of the other sex, and from all phases of society. The lady of fashion, the deaconesses who, though in the world are "not of the world," and the woman of less elevated rank, but who is yet more intimately acquainted with the actual wants and sorrows of those of her own status in society than we are. Then there are those who are seeking not only to elevate but to amuse. The fancy fairs in the West have been such a success this year, why should not the East have the gratification of seeing what it could do on a smaller scale? So the occasion of the distribution at the fifteenth annual flower show was eagerly seized to give them a "bazaar"—a *multum in parvo* affair—with prettily-decorated stalls, and bearing a family resemblance to its more full-blown sisters in the West. The spot chosen was the large school-rooms in Granby-row, in the parish of St. Mathias, Bethnal-green. The object was also that the money laid out by the visitors should be returned them, as it is to be expended in a heating apparatus for their church in the winter.

I have not a vague idea even yet of how, what with tunnels and changes of trains, and the traversing of a network of streets, I arrived at my destination, and, after a little jocular chaffing, but nothing in comparison to what I expected we should have to run the gauntlet of, found ourselves in our bazaar. No cross-legged Turks, no jewelled pipes, no, alas! no attar of roses, no glittering stuffs that look but garments fit for the lovely princesses of the "Arabian Nights"; but articles of solid utility in the way of clothing, and toys for the children, of whom there is always an astoundingly plentiful crop in Bethnal-green. There was a room where all the flowers were exhibited. One of the prizes, a fuschia of enormous size, trained by a bedridden person; then a little apple-tree raised from a pip, tobacco-plants, creepers of all kinds, &c. One of the prizes was won by one of our best velvet-weavers. In another room were cases with medals exhibited, several from the Peninsular War, some from the relics of bygone "braves," others from living owners, but all proving whatever their actual dwelling-place, Bethnal Green was evidently their nation. Pieces of chain-armour from India, snuff-boxes with pictures of Louis XVI. and others, evidently lent by some of the descendants of the Huguenot exiles of La Belle France. There were other pictures, too. The crowd grew denser towards eight o'clock in the evening, and then the doors were closed, whilst Mr. Briggs, their excellent and energetic rector, mounted the platform, and, with his sister, and Dr. Gills, and some other gentlemen, distributed the prizes. It was a sight to see the waves of upturned faces. Then, after the distribution, the good-natured crowd surged about and made their little purchases with much less chaffering than I have seen amongst finer folks. There might have been a good deal of noise, as the big drum was rather rashly entrusted to two sturdy young Britons; there might have been rather more hubbub than marks the calm repose of the Vere de Veres, but no one could go away without feeling he had never seen more forcibly illustrated the proverb "One touch of nature makes the whole world kin." Gentle and simple see in that small space how much there is of excellence in either, and can say of each other, as *Captain de Hatry* and *Sam Gerridge* do in "Caste," "Well, after all, there's *something* in him." Carleon.

THE BRIGHTON AND SUSSEX EYE INFIRMARY.

The building in which the work of this institution (founded half a century ago by the late Dr. Pickford) is carried on is being internally reconstructed. The old building in the Queen's-road has been entirely removed; and on the ground-floor, in the main body of the building, is being constructed a large ward for men, its dimensions being 38 ft. 6 in. long by 24 ft. wide, and 16 ft. high. This will give accommodation for twelve or fourteen in-patients. Immediately above will be a ward of the same dimensions, except as to height, which will be 2 ft. less, for women. To secure perfect ventilation, these wards are built upon arches, and ventilating shafts and flues, upon the most approved principles, are constructed in every available angle of the building, whilst the heating arrangements (by stoves) will be in the centre of each ward, both of which will be connected with the kitchen by a hydraulic lift. In the basement will be a sitting-room and bedroom for the caretaker, the dispensary and waiting-room for out-patients, the surgeon's room and "dark room" for examination of the diseased or injured eyes of those who may seek the assistance of the institution. With the exception of the last-mentioned room, all the apartments in the basement will be light and and airy,—the plans having been very carefully

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prepared by the architect, Mr. Somers Clarke, jun., of Dean's-yard, Westminster. They will be reached by a short and easy flight of steps at the southern (or right-hand) side of the building. On the ground-floor will be an entrance-hall (18 ft. 8 in. by 13 ft.) with matron's room, and spare ward for special cases on the right-hand side of the hall. On the opposite side will be the Board-room, 25 ft. long; with a male convalescent room over. At the rear of the entrance-hall will be the main wards already alluded to and described; and on the second floor, corresponding with those on the ground-floor, will be the nurses' room, and another spare ward for special cases. The present front elevation, which is of the Corinthian order of architecture, will remain standing, but the flight of long steps leading to the building will be reduced to three in number; the new "ground-line" being placed at that level. The massive fluted columns will be lengthened at the base to correspond with this alteration, thus giving the façade, which will be 36 ft. high to the eaves, and 46 ft. to the ridge, a loftier appearance.

The work in hand will (according to the *Brighton Herald*) be finished and the Institution ready for the reception of patients by the end of the present year, the contract (4,350*l.*) being in the hands of Messrs. Cheesman & Co., of Brighton.

ST. JOHN'S WOOD SYNAGOGUE.

The St. John's Wood Synagogue, just now consecrated, occupies a site at the corner of Abbey-road and Marlborough-place. The architectural character of the building is Byzantine, freely treated. The building is faced with red Fareham bricks, with terra-cotta and Dumfries stone dressings and ornamental details. The elevation facing the Abbey-road consists of a colonnade of arches, supported by red Dumfries stone columns, with enriched capitals. This colonnade is flanked by two turreted towers, with a gable between. The elevation to Marlborough-place is of a more simple character, but treated with the same architectural effects. The colonnade is approached by a broad flight of steps, leading into a vestibule 13 ft. wide by 27 ft. long. At each end of this vestibule is a staircase leading to the ladies' gallery, situated on the first-floor level. Under the stairs on one side is the secretary's office, and on the other side, gentlemen's cloak-rooms, retiring-rooms, &c.

The ground-floor of the synagogue is entered from the vestibule by three large doors, opening outwards, and can also be approached from the east end, where additional doors have been provided, so as to afford every facility for ingress or egress.

The first floor has been, as before mentioned, appropriated to the ladies' galleries, which are very wide, and have broad passages behind the seating, so arranged as to prevent crowding, to insure decorum, and, in the event of panic, to afford an easy means of egress. The galleries have no fewer than four doors devoted to their use. The west gallery is carried over the vestibule, and forms an architectural feature of the interior. Off the landings of the staircases are ladies' retiring-rooms, lavatories, &c.

On the second floor is a large committee-room, with lavatories and retiring-room attached.

The synagogue proper consists of a centre nave and two aisles, the galleries being supported upon coupled iron columns of ornamental design; these columns are carried up to the ceiling. An ornamental screen forms the gallery front, enriched with a vine-leaf running ornament, and ornamental iron panelling. The west end is formed by a series of arcadings in harmony with the other portions of the gallery, and the east end is devoted to the Ark or sanctuary, which is formed in a deep arched recess approached by a flight of marble steps. The chamber for the reception of the scrolls of the law, is approached from the sanctuary recess, and is of a very ornamental character, its entrance being flanked by marble columns with enriched capitals, supporting a tympanum, and decorated with symbolical enrichments. The windows are filled with stained glass from the architect's design, and executed by Mr. William Gibbs, of 397, Kingsland-road. The seating has been executed by Messrs. Cohen & Sons, of Curtain-road. The almemer, or reading-desk, is of pitch-pine, having the choir behind and the warden's seats in front. A pulpit has also been provided, and has been executed from the architect's design by Messrs. Cox, Son, Buckley, & Co., of 28, Southampton-street, Strand. The dimensions of the synagogue proper inside the walls, are 58 ft. by 45 ft. 6 in., and the height of the ceiling is 31 ft. 6 in.

Owing to the necessity for consecrating the building before the members of the congregation and their friends leave town, the time has been limited to complete the decorations of the building, but a portion has been executed by Mr. Rich, of Fortis-road, Kentish-town, under the direction of the architect, which, although simple in character, evidences an appreciation of harmony and colour.

The heating and ventilation have been carefully considered. Pure air is admitted into the building in a vertical direction, either at a cold or warm temperature, and the impure or vitiated air is carried off by means of ventilating ducts which have been provided over and under the galleries and in the main ceiling, an upward current being induced by means of Bunson's gas-burners. The heating is by means of Weeks & Co.'s (King's-road, Chelsea) new hydro-caloric coils, the furnaces, &c., being placed in a fireproof compartment in the basement. The gas has also been very carefully arranged, and the lighting of any portion of the building is under immediate control, and can be turned on or regulated at pleasure from the exterior, so that the congregation will not be disturbed during service by attendants entering the building for the purpose of lighting the burners. This portion of the work has been carried out by Mr. D. Cohen, of 8 & 9, Chiswell-street, Finsbury. The gasfittings throughout have been supplied by Messrs. Defries & Sons, Mr. Coleman Defries having presented the candelabra for the sanctuary. The memorial light was presented by Mr. Isodore Spielman.

The synagogue will accommodate, on the ground-floor, about 240 male worshippers, and in the galleries about 250 ladies.

A separate house has been built for the beadle, containing every convenience. The cost of the building, exclusive of the purchase of the site, furniture, &c., will be about 8,000*l.* The builders are Messrs. Kirk & Randall, Woolwich, and Mr. H. H. Collins, F.R.I.B.A., is the architect.

FROM ABROAD.

The Berlin Hygienic Exhibition.—At a recent meeting of the central body, it was recommended by the select committee charged with the question of reconstruction, that the new building should be of iron and glass, and should be erected upon the site of the one which was destroyed, the original plans being followed as far as possible. It was further stated that the work could be completed by May, 1883. The cost of the new building is estimated at equal to 10,000*l.* The Emperor and the municipal authorities of Berlin have sent contributions towards the expenses, which will be repaid, no doubt, out of the receipts, the amount calculated upon for exhibitors' space, entrance-money, being fully equal to meeting all cost of construction and maintenance.

Permanent Industrial and Art Exhibition at Cologne.—At Ehrenfeld, a suburb of Cologne, a building has just been completed, which is intended for a permanent exhibition. The structure is described as being executed in solid masonry on a large scale, and as having a tower which will render it an object of interest to any one looking from a slight distance at the general features of the city. The site occupies about 9,000 square yards, and further space has likewise been reserved for trials of agricultural implements. The building itself contains fifteen spacious rooms, six vaulted cellars, five covered halls, machinery annexe, with boiler-house, reading-room, concert and assembly rooms, &c. The wine and beer saloons, in the old German style, are, as might be expected, to be found amongst the features of the exhibition. The display of objects of interest is as yet on a small scale, but includes exhibits of machinery and furniture, as well as some *objets d'art*.

The Ruins at Rolandseck on the Rhine.—These interesting ruins are receiving skilful attention at the present moment, one of the arches having suffered considerably since it was partially restored in 1840. The expenses of the work are being borne by the present owner of the spot, a princess of Hesse. Under the direction of the Burgomaster of Remagen, the approaches have been improved, and basalt steps placed at spots where the ascent is particularly steep. Portions of the surrounding trees have been cleared, in order to allow of a better view being obtainable of the romantic scenery of the district.

LIVERPOOL ARCHITECTURAL SOCIETY.

By invitation of Mr. J. C. Edwards, a number of the members of the Liverpool Architectural Society paid a visit to the Pen-y-bont Terra-cotta Works at Ruabon, on Wednesday, the 26th of July. They were conducted over the works by Mr. J. C. Edwards, Mr. E. Lloyd Edwards, Mr. Richardson (chief of the designing department), and Mr. Bryan (general manager), who thoroughly explained the successive stages of manufacture. Commencing with the clay-getting, the party were conducted first to the huge pit from which the clay is obtained, and where clay-getting in its various forms was in operation (*en passant*, it may be said that the stock of clay is practically unlimited). Thence they were taken to the grinding and pugging-mills, through the engine-house, and from these in succession through the brick-making department, — "wire-cut," patent pressed, and moulded bricks of every type being in process of manufacture; next through the drying-sheds, where all the waste steam is made available for the purpose; and thence into the portion of the works where ordinary thick quarry-tiles are made, and through the terra-cotta department, where huge blocks, destined for the main cornice of the *Manchester Guardian* Offices, the Rainhill Lunatic Asylum, and other prominent buildings, were being turned out, together with every conceivable form of moulded work required throughout a building, including balustrading, heads and bases of columns and pilasters, carved panels, swags, pedestals, terminals, vases, ridge-tiles, &c., made to order for buildings in every part of the country. A visit was then paid to the modelling-rooms, where a number of men and boys were at work, modelling in plaster of Paris, from designs either made by Mr. Edwards, or sent to him by architects to be carried out. The foundation of this department was understood to be due to the energy of the general manager (Mr. Bryan), who gained his knowledge in the South Kensington Schools, and has here raised a school of modelling of which any man might be proud, the material upon which he has had to work being entirely local talent, in the shape of National School-boys, who have been trained to a pitch of excellence which is surprising. The party next went through the drawing office, where a number of draughtsmen were at work, presided over by Mr. Richardson (a pupil of Mr. Verity, architect). The drawings of works in hand were inspected, and then the roofing-tile department was gone over. Here the manufacture of roofing-tiles in all its branches was thoroughly explained, and the encaustic tile department entered. This portion of the works is under the management of Mr. Denny, who very clearly explained, in a practical manner, the entire process, which was generally pronounced to be of a most interesting character; then the clay-mixing rooms (for colours other than those of the natural clay), the fitter's shop, where the intricate patterns for encaustic tiles are made, the pattern-room, where thousands of patterns of moulded bricks, &c., are stored, and the tile store-room, were successively explored, and in the latter numerous entirely new samples were exhibited, which were very favourably commented upon. The tile-glazing process and firing were then explained, and finally several kilns just being drawn were entered and the contents examined.

Many acres of land are covered by the works, and they are a surprising instance of what can be done with capital and energy combined, the whole being the result of only ten years' work, and having been built up bit by bit as the trade was found to develop.

A shocking Accident has occurred at Gateshead. As the workers at Scott's brickyard were having their dinner a portion of a burning kiln fell upon them, killing two boys on the spot. The men received severe injuries in their efforts to rescue the boys.

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THE LONDON AND MIDDLESEX ARCHÆOLOGICAL SOCIETY.

A GENERAL meeting of this Society was held on Saturday last, when a visit was paid to the Church of St. Olave, Hart-street, Crutched Friars. There was a good attendance of members and visitors, amongst those present being Mr. Pitman, Mr. Garratt, Mr. Lambert, Mr. Goodman, Mr. W. Ash, Mr. Crace, Mr. Brabrook, Mr. Thrupp, Mr. Price, Mr. Edwin Nash, and Mr. G. H. Birch (one of the honorary secretaries). The Rev. A. Povah, rector, in a paper on the church, said there was a tradition about a cripple in France who dreamed that he saw a venerable old man who told him that if he went to St. Olave, in London, he would regain his strength. He proceeded on his way, and on his arrival was at length directed by a citizen to St. Olave's, Hart-street. The cripple, it is said, rolled his body over the threshold into the yard, and immediately rose up restored to strength. Whether that were true or not, the essayist said it was certainly true that King Olaf, after whom the church was named, was famous in his lifetime for his victories over the Danish invaders. The first account they had of the living was that in the year 1319,—the reign of Henry II.,—an inquiry was made about the monastery. The church, however, was not to be regarded as earlier than the reign of Henry IV. The foundations of the chancel consisted of unhewn stone, while the columns and arches were of Purbeck of an inferior quality. The ceiling was of oak, a part of it having been renewed in 1633. The vestry minutes contained some curious items. In the year 1713 instructions were given for the footmen to be placed in one of the galleries and the maid-servants in pews sufficiently remote for the purpose; also that none should be admitted to the ancient's gallery except parish officers. The old communion-table was placed in the church 121 years ago, having been obtained by voluntary subscription. The present reredos was designed by Sir George Gilbert Scott, and placed there by the present rector, the pulpit, a very fine old specimen of carving, having been brought from a neighbouring church. Amongst those who slept in the vaults beneath was the wife of Samuel Pepys, on whose monumental plate are written the following words:—"She would not bring any offspring because she could not bring forth any equal to herself." The registers date back to the year 1576, and amongst those who signed their names in them were Samuel Pepys and the celebrated Earl of Essex. Mr. H. B. Wheatley afterwards read an amusing paper on worthies connected with the church, referring chiefly to the curious gossip of the old diarist, Pepys, to whom, as we have lately mentioned, it is proposed to erect a monument in this church.

The visitors afterwards proceeded to the Church of All Hallows Barking, at the eastern end of Great Tower-street, a building which is much larger and much lighter in appearance than the church of St. Olave. Although it escaped the fire of 1666, not a large portion of it can be called ancient. The original church was in the Norman style, but nothing remains of that style now except the foundation; the rest is debased Gothic. The secretary read a paper prepared by the Rev. Joseph Maskell, who was travelling on the Continent, in which it was stated that the first grant in connexion with the church was made by Walter, the bishop in the reign of Stephen, the grant being afterwards confirmed by Henry II. The church existed under its present name as early as the Norman period of English history, and the nuns came thither from Barking, in Essex, up to the time of the demolition of the monasteries. Alderman John Cope founded the chancel, and amongst those who were interred in the vaults of the church was William Tim, the first collector and editor of Chaucer's poems. Many eminent men were born in this parish, including Bishop Andrews, William Penn, the founder of Pennsylvania, who first saw the light on Tower-hill, and the late Lord Chief-Justice Bovill, who was born in Catherine-court in the year 1810. The chantry of St. Mary was founded by Richard I., whose lion heart is still to be seen in a case at Rouen. Edward I. confirmed these privileges, and also set up in the church an image of the Virgin Mary, he having been told in a vision that by so doing he would conquer the Welsh and the Scotch and be victorious in all his battles. The pulpit and sounding-board were set up in the reign of James I.

BRISTOL AND GLOUCESTERSHIRE ARCHÆOLOGICAL SOCIETY.

On the 25th ult. this Society held its seventh annual meeting, at Stow-on-the-Wold, under the presidency of Sir John Maclean, F.S.A., the out-going President.

The report of the Council, which was submitted, stated that there were at present 446 annual members and 74 life members. The income of the society for the financial year 1881-2, including last year's balance, was 469*l.* 12s. 9d., and there was now a balance of 198*l.* 1s. 10d. in the treasurer's hands. Since the last report of the Council the society had held its annual summer meeting at Chepstow, its annual winter meeting at Gloucester, and three local meetings, two in the Forest of Dean, and one at Berkeley Castle. These meetings produced more than sufficient materials for the sixth volume of the society's transactions. The Council had to announce the loss of more than 700 volumes of the Transactions for the years 1877-81, owing to a disastrous fire at the printers. It was gratifying to be able to announce that during the last year Lord Fitzhardinge had very liberally and courteously given his consent to the very valuable MS. of John Smyth, the antiquarian, written in the early part of the seventeenth century, and the ancient MS. Register of the Abbey of St. Augustine at Bristol, which are preserved in the muniment-room at Berkeley Castle, being printed by the society for its members. During the present year a very valuable work, "Archæological Handbook of the County of Gloucester," would be privately printed by Mr. G. B. Watts, one of the members of the society and a member of the Council. By a careful personal survey of the whole county, Mr. Watts had been enabled to discover a great number of Roman and British camps, &c., which had hitherto been unknown. These were all shown in the maps which would accompany the work. The Council regretted that, with such a work on its hands as Smyth's MSS., it would be unable for the present to print the account of Flaxley Abbey, by Mr. A. Crawley Boevey. They deeply regretted the retirement of Mr. Palmer Hallett (as one of the general secretaries), whose eminent services entitled him to deep and lasting gratitude on the part of the members. The kind consent, however, of Dr. Caldicott, head-master of the Bristol Grammar School, to undertake the work of general secretary, had enabled the Council to accede to Mr. Hallett's wish to retire. With regret they announced the resignation of Mr. J. Reynolds as local secretary for Bristol, and desired to nominate Mr. E. Strickland in his room. The following members of the Council retired by rotation:—Mr. J. T. D. Niblett, Mr. G. B. Watts, the Rev. Canon H. A. Ellacombe, the Rev. W. B. Oakley, Mr. W. Cripps, and Dr. Paine. The Council also regretted the resignation of Mr. J. Bellows, and nominated in his room the Rev. S. E. Bartlett. In the room of Dr. Caldicott, Mr. H. J. Reynolds was nominated on the Council. The Council, having heard that it was in contemplation by the Dean and Chapter of Bristol to destroy the ancient Minster-house, had thought it proper to appoint a committee to protest against such destruction.

The retiring president then introduced the new president (Mr. E. Rhys Wingfield), who delivered an address.

The Rev. R. W. Hippisley, rector of Stow-on-the-Wold, proposed, and the Rev. D. Royce seconded, that the following gentlemen be requested to accept the position of members of the Council:—Messrs. J. D. T. Niblett, G. B. Watts, the Rev. Canon H. N. Ellacombe, the Rev. W. B. Oakley, Mr. W. Cripps, Dr. Paine, Mr. J. Reynolds, and Mr. R. Bramble. This was carried unanimously.

Sir W. Guise moved, and Mr. Niblett seconded, a vote of thanks to the retiring president (Sir J. Maclean).

The motion having been carried with acclamation, Sir John replied, saying that he had felt no difficulty in carrying out the duties of the office.

The members subsequently visited the parish church. On the south wall of the nave there is a large picture of the Crucifixion, by Casper de Crayer, the contemporary and friend of Rubens and Vandyck. The ancient cross in the Market-place was next visited. Originally it was a very fine piece of work, said the Rev. D. Royce, but till a few years ago it was used as a lamp-post. In 1878, however, the inhabitants of Stow restored it, to commemorate the munificence of the late Mr. J. C. Chamberlayne, who gave 2,000*l.* to obtain a supply of pure water for the town. Breaks being taken, the party proceeded to Nether Swell and Upper Slaughter Churches, and inspected some earthworks. The annual dinner took place in the evening, and afterwards some papers on local subjects were read.

On Wednesday, the 26th, the members proceeded in breaks to Icomb-place, a large and interesting old mansion, and the Manor-house of Icomb in former times. Here a paper was read by the Rev. D. Royce, of Nether Swell, one of the local secretaries of the association. The residence, which is quadrangular in plan, is thought to have been built in the middle of the fifteenth century, and it was for a long time the seat of Sir John Blacketts. In Icomb church there is a chantry, and the Icomb Manor estate (whose proprietors are traceable from the time of Edward III. to the present day) is still liable for the repair of that chantry. Mr. Royce and Mr. Waller, of Gloucester, conducted parties over the building, pointing out its most important features. Bledington Church was next visited, and was described by Mr. Cutts, who carried out the partial restoration which the edifice has recently undergone. It contains Norman, Transitional Norman, and Early English work, but is mostly later; the tower, as is the case at Upper Slaughter, is built within the church. A long drive took the members to Chastleton-house, a large early sixteenth-century residence, now belonging to Miss Whitmore-Jones. Chastleton Camp was next visited. The Rev. D. Royce was of opinion that this was originally a British camp, but it was afterwards altered and used by the Romans. Sir John Maclean doubted if it was ever a British camp. A *conversazione* was held in St. Edward's-hall, Stow-on-the-Wold, in the evening.

A concluding meeting was held on Thursday, the 27th, when it was decided that the next annual meeting of the society should be held at Bath. The choice of a president for the Bath meeting was left to the Council. Subsequently a large party took breaks for the third and last day's excursion. The first halt was at Salmonsbury Camp, near Bourton-on-the-Water, where a piece of wall was exposed. They next proceeded to Farmington, where they were met by the vicar, who pointed out the various features of the church. A few miles' further driving brought the party to Northleach, an old and decayed town, once a great centre for Cotswold woolstaplers, and afterwards the home of cloth-weaving. An inspection of the parish church followed, a descriptive paper being read by the Rev. D. Royce, of Nether Swell. The next place visited was Hampnett, where there is much Norman work and a fifteenth-century tower. At Notgrove the manor-house was visited. Here lived the Gloucestershire family of Whittingtons, from which the celebrated Dick Whittington came, and in the chancel of the church are two effigies of members of the family. Near to Notgrove Station a British barrow was inspected, and a paper by Mr. G. B. Watts was read.

THE ROYAL ARCHÆOLOGICAL INSTITUTE.

MEETING AT CARLISLE.

THE Royal Archæological Institute of Great Britain and Ireland commenced its annual meetings at Carlyle on Tuesday last. Lord Talbot de Malahide, president; Mr. Freeman, the historian of the Norman Conquest, who presides over the historical section; Mr. Evans, who presides over the antiquities section; and Mr. Beresford Hope, who will be president of the architectural section; the Bishop of Bath and Wells, Dr. Collingwood Bruce, Precentor Venables, Mr. Tucker (Somerset Herald) and other archæologists are among those attending the meeting. The opening address was delivered by the Bishop of Carlisle as president of the meeting. The address dwelt at length upon the interesting nature of the antiquarian and archæological associations of the city of Carlisle, which a high authority (Mr. Freeman) had said "stand out beyond those of almost any other English city on the surface of English history." The bishop observed that the time had gone by in which archæology could be confounded with antiquarianism of the Monkbarns type. We recognised that archæology, being in reality the science of past time, was the basis of history, of

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politics, even in a certain sense, of religion itself.

Lord Talbot, in moving a vote of thanks to the Bishop of Carlisle for his address, intimated his intention to retire from the presidency of the Institute. Having now occupied that position for about thirty years, he thought that he had earned his retirement.

Mr. Freeman expressed regret at this announcement, and hoped it was not too late for Lord Talbot to consider the matter.

His lordship replied that he would not desert the Institute in a pinch; but he asked them to take his case into consideration.

The proceedings of the meeting were thus brought to a close.

A perambulation of the city was afterwards made, and several places of interest visited. The Mayor of Carlisle, Mr. R. S. Ferguson, gave a *conversazione* in the evening, at which Mr. Freeman read an interesting paper upon the position of Carlisle in history.

On Wednesday there was an excursion to the Penrith district. A party, numbering nearly 300, inspected the objects of antiquarian interest with which the district abounds. Short addresses were delivered by Mr. Evans, President of the Antiquarian Section; Professor Stevens, of Copenhagen; and Mr. Clark, of Dowlais. In the evening the Antiquarian Section met under the presidency of Mr. Evans, when Lord Talbot de Malahide read a paper on the antiquities of Algeria.

THE ST. PANCRAS WORKHOUSE COMPETITION.

A meeting of the Board of Guardians of St. Pancras was held at the Vestry-hall, under the presidency of Mr. Commissioner Kerr, on the 27th ult., when the vexed question which has agitated the parish during the last four or five years, of whether an enlarged workhouse shall be erected on the site of the present workhouse or a new additional workhouse be erected elsewhere, was brought to a termination,—that is, if the Local Government Board do not further interpose. The arbitrating architect, Mr. Arthur Cates, pronounced in favour of the plans of Messrs. Young & Hall and of Mr. H. H. Bridgman, as being the only ones complying with the requirements of the Local Government Board, and recommended the guardians to select either of these competitors as architect for the new workhouse buildings. A report to this effect was now presented to the guardians, and on putting the names to a show of hands there were nine for Mr. Bridgman and seven for Messrs. Young & Hall. Mr. H. H. Bridgman was, therefore, declared elected, subject to his plans being accepted by the Local Government Board. It is believed the works will cost considerably over 100,000*l*. It will be remembered that the Guardians in the first instance, acting before they called in professional advice, selected the design sent in by Messrs. Wilson, Son, & Aldwinckle. Mr. Westacott moved that a cheque for 150 guineas be drawn for Mr. Arthur Cates, the consulting architect; and four cheques, for 75*l*. each, for each of the unsuccessful firms of architects who had competed. This was adopted.

THE NEW GRAMMAR SCHOOL BUILDINGS AT SHREWSBURY.

The new buildings at Kingsland, Shrewsbury, which have been occupied for some little time past by the boys of the famous Grammar School belonging to the town, were formally opened by Lord Cranbrook on the 28th ult. By the removal to the new site, which has been accomplished after much consideration, the school acquires advantages of residential comfort and playing space which were lamentably lacking in the historic buildings in Castle-street, passed by every visitor who enters the town from the railway station. Instead of the painfully apparent cramping character of the former situation, endeared to thousands by the proud associations of a distinguished public school, the new school and grounds occupy twenty-eight acres of beautifully picturesque land on an eminence overlooking the river Severn, and the work has been accomplished at a cost of upwards of 40,000*l*. The principal building has been constructed in what is recognised as the Queen Anne style of architecture, and the structure is one of the features of the town. Singularly enough the school is not an entirely new erection, but has been converted from a block which years ago fulfilled the purposes of the workhouse for the Atcham Union. It is superfluous to say that the conversion has been complete, and the provision for its future occupants of the most elaborate kind. The length of the school is 180 ft., with a breadth of 50 ft., and the three stories are chiefly devoted to class-rooms, the principal one in the second floor running two-thirds of the entire length of the building. To the west of the school is a house, built for the head-master, and in the rear of this are two houses for the accommodation of the second masters. In the grounds stands a commodious cricket pavilion, and a boat-house has been fitted up on the edge of the river.

Messrs. Treasure & Son, of Chester-street, Shrewsbury, executed the contracts for the school and head-master's house, the estimates for which were respectively 14,000*l*. and 11,000*l*., from the designs of Mr. Arthur W. Blomfield. Mr. W. White, F.S.A., was the architect for the under-master's houses, and the contract for 11,000*l*. was undertaken by Mr. Oliver Jones, of Shrewsbury. In our volume for the latter half of 1881 (xli., pp. 330, 332) we gave a view and plans of one of the under-master's houses.

THE NEW GRESHAM ALMSHOUSES AT BRIXTON.

In consequence of the ancient Gresham almshouses in Whitecross-street being required for City improvements, new almshouses in connexion with this charity are now in course of erection at Brixton by the Mercers' Company, acting as the Gresham Committee. The site of the new buildings is in immediate contiguity to the Corporation almshouses, in Shepherd's-lane, and has been purchased from the Corporation by the Gresham Committee for that purpose.

The foundation-stone of the buildings was laid a few weeks ago, by one of the Gresham Committee. The block, which consists of eight separate houses, is 180 ft. in length and 24 ft. in height, consisting of one floor only. The elevation is of red Suffolk brick, with Portland stone windows, entrances, and dressings. Each house has an arched entrance, with large two-light moulded mullion windows, above which there is a projecting cornice, the elevation being surmounted by eight gablets, and the roof is covered in with red Broseley tiles. In the centre of the elevation there is a slab in Portland stone, containing a carved representation of the Mercers' Company's arms, under which is an inscription recording the date of the erection of the houses.

Each house contains a living-room, 14 ft. by 12 ft., together with a bed-room, 14 ft. by 9 ft., and kitchen, coal-cellar, and other conveniences. At the rear of the buildings each house has a piece of garden-ground about 40 ft. in depth.

The buildings have been designed by Mr. G. Barnes Williams, architect to the Mercers' Company. Messrs. Ashby & Horner are the contractors, and Mr. Thomas Hopkins is foreman of the works.

"PEDAL" ACTION CLOSET.

A simple arrangement for actuating a closet with a pedal in place of a handle, has recently been patented by Mr. S. H. Terry, and is being manufactured by Messrs. J. Tylor & Sons, of No. 2, Newgate-street.

Amongst other advantages of this arrangement are claimed cleanliness, economy of time, and increased simplicity of construction, there being actually fewer moving parts than in a hand-action closet. The mechanism is entirely self-contained, consequently no extra skill is required in fixing it, as is the case with treadle-action closets, which require joints and fulcrums to be fixed beneath the floor. Treadle-action closets having inaccessible moving parts, subject to corrosion, are liable to derangement and consequent waste of water; the action of this closet being non-automatic, there can be no more waste of water than with the old-fashioned handle-closet, and when fitted with Messrs. J. Tylor's regulator-valve, which closes after the passage of a certain volume of water, whether the lever be held up or not, deserves the notice of corporations and water companies on the score of economy of water. In applying this action to valve-closets, the weight-lever is prolonged and carried through the riser,—the sunk brass dish, the handle, and its attachments, being done away with. This type of closet can be had with the pedal in front or at the side, as may be desired. The action is also being fitted to actuate "syphon," "waste-preventer-water-cistern-closets," earth-closets, as well as ship's "above water-line" closets, at a cost which is almost identical with that of handle-closets.

Mr. Edward Griffith, C.E., of 18, Abingdon-street, has adopted this type of closet, and, amongst other places, has put one into H.R.H. the Duke of Albany's house, Claremont. It has met with the approval of Mr. Robert Rawlinson, C.B., and others.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

3,340. A. Drummond, Edinburgh. Securing glass to astragals and sash-bars. July 14, 1882.

3,344. W. S. Laycock, Sheffield. Self-acting window-blind apparatus. July 14, 1882.

3,358. A. W. White and J. H. Evans, London. Bell-traps for drains. July 14, 1882.

3,361. T. Hughes, Market Drayton. Metallic glazing bars and fittings. July 15, 1882.

3,371. H. A. Williams, Lincoln. Pulleys for window-blind rollers. July 15, 1882.

3,416. T. J. Baker, Newark. Chimney-tops or ventilators. July 18, 1882.

3,444. E. L. Ransome, San Francisco, U.S.A. Artificial stone or concrete pavement, &c. July 20, 1882.

3,459. A. Dix and T. H. Dix, Rock Ferry. Apparatus for checking cords of blinds, &c. July 20, 1882.

3,461. J. Shank, Barrhead. Valvular details of domestic apparatus for the supply, &c., of water. July 21, 1882.

3,472. J. Solomon, London. Prevention of chimneys smoking. July 21, 1882.

3,486. J. Leather, Liverpool. Ventilating appliances. July 22, 1882.

3,487. E. Edwards, London. Apparatus for maintaining a constant draught in chimneys, &c. (Com. by A. Marques, Bordeaux.) July 22, 1882.

3,511. W. Wright, Plymouth. Flush cisterns, &c. July 24, 1882.

3,550. C. S. Beauchamp, London. Automatic apparatus to ensure safety in case of fire in theatres and buildings. July 26, 1882.

3,554. J. L. Thomasson, Worcester. Ventilators. July 26, 1882.

3,565. H. Morris, Manchester. Apparatus for adjusting ventilators, &c. July 27, 1882.

3,573. A. L. Liberty, London. Construction of ornamental windows, blinds, &c. July 27, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named:—

July 18, 1882

1,522. J. B. Denton, Westminster, and G. Butler, Turnham-green. Apparatus for flushing sewers, &c. June 29, 1882.

1,579. D. Summerfield, Aston. Locks and latches. March 31, 1882.

2,447. R. Henry, Edinburgh. Apparatus for opening and closing window-curtains. March 24, 1882.

July 21, 1882.

1,325. C. Slagg, Leeds. Drain and sewer pipes. March 18, 1882.

July 25, 1882.

1,351. J. Rettie, London. Binding for scaffolding. March 20, 1882.

1,357. J. Thom, Wolverhampton. Securing door-knobs to their spindles. March 21, 1882.

1,434. E. G. Banner, London. Sewers. March 24, 1882.

1,973. R. Boyle, London. Ventilators for buildings, &c. June 22, 1882.

3,049. R. Searle, London. Manufacture of artificial stone. June 28, 1882.

July 28, 1882.

1,432. W. Bartholomew, London. Flushing tanks, &c. March 24, 1882.

ABRIDGMENTS OF SPECIFICATIONS.

Published during the Week ending July 22, 1882.

5,351. T. Rowan, London. Warming and ventilating.

A lamp is placed in a tube or passage, one end of which is open to the outer air, and the other end terminates in a

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street.

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filtering box, in the bottom of which is water, while the rest of the box is filled with coke, &c. From this box the air is passed to the room to be ventilated. Dec. 7, 1881. Price 6d.

5,379. J. C. Baker, Liverpool. Ventilating ships and buildings, &c.

Instead of drawing the air out of ships, buildings, &c., at one point, the ventilating-pipe has numerous branches terminating in orifices all over the place to be ventilated. Dec. 9, 1881. Price 6d.

5,446. J. J. Royle, Manchester. Gasfittings, reading-lamps, &c.

This is an application and adaptation of the union joint described in Patent No. 2,350 of 1879 to a pipe attached to the usual burner, and turned downward so as to have a lighted burner nearer to the table or floor. Dec. 13, 1881. Price 6d.

5,466. W. Bash, S. Bash, and U. S. Damsa, Manchester. Locks and latches.

The "sliders" of the lock project through the case, and form the bolt or latch which secures the same. Steps are made in the catch to prevent the picking of the lock. Dec. 14, 1881. Price 6d.

5,503. J. Milne, Edinburgh. Fire-lighter.

This is made of asbestos in form of a ring, with a shallow metal vessel inside in which is paraffin oil and a wick. When this is lighted the apparatus is put inside the fire until the coals are kindled. (*Pro. Pro.*) Dec. 16, 1881. Price 2d.

5,510. L. H. Barnett, London. Castors for bedsteads, &c.

These have two wheels supported by a horizontal frame, pivoted on a vertical axis. (*Pro. Pro.*) Dec. 16, 1881. Price 2d.

5,515. J. D. Taylor, Halifax. Traps for sewers and drains.

These are syphon-traps, around the inlet-pipe of which is mercury to prevent the gases from escaping. (*Pro. Pro.*) Dec. 16, 1881. Price 2d.

5,526. T. Fletcher, Warrington. Plastic composition for fire-resisting purposes.

Instead of fitting fireplaces with bricks, a plastic compound is used, consisting of a mixture of solution of silicate of soda or potash with ordinary fire-clay. (*Pro. Pro.*) Dec. 17, 1881. Price 2d.

5,527. J. C. Millard, London. Cocks and valves.

This is chiefly applicable to ball-valves. The supply-pipe enters the body of the cock at the side, and rises up inside the same to the valve. The outlet is the annular space between this pipe and the outer case of the body. The valve fits on the top of the supply-pipe, and is actuated by the ball. (*Pro. Pro.*) Dec. 17, 1881.

Published during the Week ending July 29, 1882.

5,424. E. A. Rippingille, Aston. Gas-stoves.

This improves gas-stoves in a variety of minute details, which are shown in thirty-three figures in the drawings, but which are not capable of being condensed. Dec. 12, 1881. Price 8d.

5,554. B. C. Cross, Dewsbury. Apparatus for fastening, releasing, and preventing the rattling of window-sashes, &c.

A plate is fixed to the window-frame, behind which is a spring plate carrying a knob, which protrudes through a hole in the fixed plate, and engages a hole in the edge of the sash. A movable bar is arranged to withdraw the knob from the hole. This is actuated by a pedal lever inside the room. On the pressure of the foot on this lever the knob is withdrawn and the sash is free to move. Dec. 18, 1881. Price 6d.

5,571. A. M. Clark, London. Manufacture of floor coverings.

The canvas or other base of these floor coverings is covered with a mixture of ground animal fibre, mineral fibre, and a binding material such as varnish. Wood fibre may be used instead of animal fibre. (Com. by C. T. Meyer and V. E. Meyer, Jersey City, U.S.A.) Dec. 20, 1881. Price 6d.

5,572. E. A. Brydges, Berlin. Adjustable supports for small looking-glasses, &c.

These are formed of bent wire, the ends of which fix in sockets in the back of the glass, &c. (Com. by U. Wiederer, Furth, Germany.) Dec. 20, 1881. Price 2d.

5,576. H. S. Cregren, Bromley. Heads and gratings for air-inlets, &c., of soil-pipes and drains.

A box is fitted, through the bottom of which the pipe rises so that the box forms a trough round the pipe. On the top is a grating, but the part immediately above the pipe is solid, so that any stones or other solid matter falling down enters the trough and does not fall into the pipe. Dec. 20, 1881. Price 4d.

5,603. O. Trossin, London. Furnaces or fireplaces for the consumption of smoke.

The coal is coked in a hot chamber communicating with the fire before being burnt in the grate. The gas produced in this hot chamber is carried by pipes to the fire where it is burnt (*Pro. Pro.*). Dec. 22, 1881. Price 2d.

Mr. J. Pape Symes, who, for fourteen years, has superintended the engineering works of Messrs. Wailes & Robinson, of Euston-road, is about to sail for the Cape for the benefit of his health, accompanied by his wife and family. As a mark of the esteem in which he is held by the *employés* of the firm, he has been presented by them with a gold watch and an address, while another testimonial has been presented to him by the apprentices.

CLAIM UNDER THE EMPLOYERS' LIABILITY ACT.

ACTION AGAINST AN ARCHITECT.

Last week, at the Wandsworth County Court, a bricklayer's labourer, named Robinson, brought an action against Mr. Nunn, of Trinity-road, Wandsworth, claiming damages for injuries sustained by falling from a ladder while at work on premises belonging to the defendant, alleging that the injury was caused by the negligence of those in the defendant's employ.

On behalf of the plaintiff it was stated that on the 24th of March he was employed at some houses which were being built for the defendant in Trinity-road, Upper Tooting. It was part of his duty to assist the carpenters and bricklayers by taking up bricks and wood to them. A wall had been built to the height of 13 ft., when he was told to take up a piece of quartering. The ladder was only 3 ft. 4 in. above the scaffolding, instead of being the height of a man, and was consequently too short. It would not have reached the scaffold at all had it not been on a "horse." He carried the quartering in his right hand, and when he put out his left hand to reach the last rung of the ladder, as he thought, he missed his hold, and fell. He broke his right arm by the fall, and sustained other serious injuries, which compelled him to attend as an out-patient at St. George's Hospital between ten and eleven weeks, and he had not since been able to do any work. Some time after the accident he saw the defendant, who offered to pay him 17s. a week if he would sign a paper, which he refused to do. Amongst the witnesses called for the plaintiff was Mr. Walter Greenbrough, a builder and house decorator, who said he was acquainted with the building of scaffolding and the placing of ladders. He said that a ladder should be 5 ft. 6 in. or 6 ft. higher than the scaffolding or landing. No one of experience would go up a ladder only 3 ft. 4 in. above the level. It was stated in the course of the hearing that the foreman placed the ladder where it was.

On behalf of the defendant witnesses were called to prove that the ladder was about 5 ft. above the scaffolding. It was also stated that the plaintiff was not asked by any one in authority to take the quartering up, but took it up on his own account.

Mr. Nunn, the defendant, was called, and stated that he was an architect, and that he was building these houses for himself, and personally superintended the work. The height of the ladder above the scaffolding was between 4 ft. and 5 ft., which he considered sufficient for safety. The plaintiff was in the employment of the foreman of the bricklayers, and he (the defendant) had nothing to do with him. He explained, with regard to offering the plaintiff money, that he had been informed the men intended to subscribe 15s. a week for the plaintiff, and he thought he might do the same thing, and did so.

The Judge said that under the first sub section of the Act he must hold the defendant liable, owing to the omission in the placing of the ladder. He gave judgment for the plaintiff. Damages 50*l.* and costs.

GLASGOW MUNICIPAL BUILDINGS COMPETITION.

Sir,—For your further information, I beg to say that the Council of the Glasgow Institute of Architects has now received official notice that the Municipal Buildings Committee of the Town Council, having again considered their representation as to the exhibition of rejected sketches, unanimously adhere to their former decision.

Further, that they have resolved to recommend to the Town Council that all the designs submitted in the final stage be publicly exhibited; and also that either the Corporation Galleries or the City Hall be given to the Glasgow Institute of Architects for a fortnight free of charge, for the exhibition of the rejected designs. The course before the Institute, therefore, is now clear, and the success of the proposed exhibition will depend on the co-operation of competitors themselves.

It should be borne in mind that the Glasgow Institute is undertaking the trouble and responsibility of this exhibition entirely because it is thought that the interests of the profession demand it, and because they have been appealed to by architects in all parts of the country. It acts as an impartial professional society, not as a body of unsuccessful competitors. Neither the president nor the secretary, nor others on whom the burden of the work will chiefly fall, were competitors in either of the competitions. Some expressions in professional journals seem to make this explanation necessary.

William Maclean, Secretary.
Glasgow Institute of Architects.

"DEMAND" *VERSUS* TECHNICAL EDUCATION.

Sir,—I am glad to find that your correspondent, an "Old Art Workman," coincides with what I have repeatedly maintained in the *Builder* and elsewhere, "that it is the master who most requires technical education, and that in this country we begin things at the wrong end." Let us, however, rightly comprehend the due order and sequence of things in the production of the finer kinds of work. The masters would cast the onus of bad taste on the purchaser; "we," they would say, "respond to the demand." And this brings us to the head and front of the offending, and to my main contention. Can there be the slightest doubt that if, as in times past, there were again to be a great demand for wood-carving and art-workmanship of every kind, there would be an eager and effective response both from masters and workmen? Demand is the great technical educator. It was "the demand" that made the great art epochs. Without this demand, technically educate men as you will, it will be in vain.

W. Cave Thomas.

SAFETY IN THEATRES.

Sir,—Will you permit me the use of your columns to call attention to simple and efficient ventilators for roofs over the stage, which can be used either independently of, or in conjunction with, the curtain and hydraulic apparatus, explained in my letter on the subject of "Fireproof Curtains," published in your columns on the 11th of March last.

Ventilators of any required size open outwards at the apex of the roof into a perpendicular position by means of the same hydraulic arrangement that raises or lowers the curtain as therein explained. Attached to the ventilating-gear is a weight which gradually descends when hydraulic pressure is withdrawn, causing the ventilators to open into the position mentioned. The hydraulic main is always ready for an emergency. The ventilators cannot be closed, or, if in conjunction with the curtain, the latter cannot be drawn up in order to proceed with theatrical business unless the main is properly charged. Thus, in the event of fire it does not depend upon an official to charge the main in order to open the ventilators and lower the curtain. On the contrary, it is the discharge of the main by opening any one of the valves fixed for the purpose within or outside the building, as explained in my last letter, on which reliance is placed; this arrangement being preferable in consequence of its simple and certain action over any other known form of mechanical appliance; it is under the control of any one, and, unless wilfully, cannot be easily disarranged without all officials on duty being aware of it.

John H. Tyler.

Miscellanea.

Cooper's-hill Engineering College.—The distribution of prizes to the successful students in the eleventh session of Cooper's-hill Engineering College, took place on the 28th ult., in the presence of a large gathering. Lord Enfield, Under-Secretary of State for India, distributed the prizes. Messrs. H. B. Taylor and G. Wylie were appointed scholars of Cooper's-hill; Mr G. Wylie, third year student, was appointed Fellows scholar; Mr. H. M. J. Bacon gained a foundation scholarship in engineering; Mr. H. R. Hackman, the Argyll scholarship in natural science, given by the Marquis of Hartington; Mr. S. P. A. Dyson, the Public Works Committee of the Council of India scholarship in applied mechanics; and Mr. A. E. Orr, the president's scholarship in mathematics. Lord Enfield, who was received with cheers, said the report appeared to be everything that was satisfactory. The Secretary of State had agreed to sanction the expenditure of a sufficient sum of money to construct suitable laboratories, a new class-room, and a specimen room with proper machinery. The ranks of the students were about to be increased by the removal to Cooper's-hill from Nancy of half the students under training there for the Forestry Department in India.

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Social Science Association.—The annual business meeting of this association was held on the 19th ult., the treasurer, Mr. Joseph Brown, Q.C., in the chair. A report, dealing with the action of the council in regard to various questions taken up during the past twelve months, was presented and ordered to be circulated. These questions include copyright, married women's property, settled land and conveyancing bills, foreign marriage laws, Irish poor laws, administration of hospitals, and notification of infectious diseases. Lord O'Hagan was elected a permanent vice-president of the Association, and Mr. Hastings, M.P., was re-elected to the office of president of the council. The following were appointed secretaries of departments for the ensuing year:—(1) Jurisprudence and Amendment of the Law, Mr. H. N. Mozley, Mr. R. Denny-Urlin, and Mr. A. Herbert Safford; (2) Education, Mr. Rowland Hamilton; (3) Health, Mr. H. H. Collins, Mr. Edward Seaton, M.D.; (4) Economy and Trade, Mr. George Baden-Powell, M.A., Rev. S. A. Steinthal, Mr. Edward J. Watherston; (5) Art, Mr. H. C. Boyes, and Mr. P. H. Rathbone. Mr. Westlake, Q.C., was re-elected foreign secretary, Mr. Joseph Brown, Q.C., treasurer, and Mr. Andrew Dunn and Mr. A. Edgar, LL.D., were appointed auditors for the ensuing year. The standing committees of departments were also elected, and a financial statement was presented, showing a balance carried forward of 187*l.* 16s. 6d.

Crystal Palace.—The award of scholarships and prizes to students in the ladies' division of the Crystal Palace School of Art, Science, and Literature, was completed on Saturday, when Mr. Edwin Long, R.A., Mr. Joseph J. Jenkins, F.S.A., R. Soc. P.W.C., and Mr. G. Elgar Hicks, adjudicated on the work of the students in the art classes. The medal for water-colour painting (landscape, architecture, &c.) was given to Mrs. Edward Milner (née Hamilton), the certificate to Miss S. E. R. Horton, to whom the scholarship in art was adjudged; the medal for water-colour painting from the life to Miss Jane M. Bethune, the certificate to Miss Lina Newall; the prizes for drawing from the antique to Miss M. Flood Page; the certificate for drawing from the life to Miss E. S. Norton. The scholarship in music has been adjudged to Miss Alice Ferrier; the scholarship in modern languages, literature, &c., to Miss Elsie Atkins.

Regent's Park.—An influential deputation from the inhabitants of Marylebone has waited on the First Commissioner of Works to urge him to throw open to the public the fourteen acres of ground, extending by the ornamental water from Hanover-gate to York-gate, for more than half a mile, which is now enclosed and reserved for the use of key-holders. Mr. Shaw-Lefevre said that by the Act of 1851 the ground in question had passed from the Crown to the people, and he was himself of opinion that it would be most desirable to throw the piece of ground open. Hitherto the lessees of the Crown Estate had objected to this being done, alleging that if the ground were made public, their property would be depreciated in value. However, the question should now again engage his serious attention and that of the Government. He thought he saw his way to remove all difficulties, and by opening this ground to confer a great boon on the public.

Sudden Death of an Architect.—Mr. W. Carter, Coroner for East Surrey, has held an inquiry at the Coroner's Court, Lambeth-road, into the death of Mr. David Thomas Childs, aged fifty-one years, architect and surveyor, of Jermyn-street, Piccadilly, and Grove-crescent, Spring-grove, Kingston, Surrey, who was found dead in a second-class carriage on the London and South-Western Railway, near Raynes Park, on the morning of the 27th ult. The deceased left Surbiton at 9·50, and as the train neared Raynes Park, deceased became very ill. The train stopped at the station, where the officials were informed of the circumstances. The train, however, went on, and shortly afterwards Mr. Childs expired. The jury returned a verdict of "Death from natural causes."

Medals.—Messrs. Robert Boyle & Son's system of ventilation for buildings and ships was awarded the gold medal (highest prize) at the International Exhibition of Means and Appliances for the Protection and Preservation of Human Life, Alexandra Palace, London, July, 1882.

Monumental.—The committee for erecting a statue of the late Lord Frederick Cavendish have entrusted the commission for the work to Mr. Albert Bruce Joy.

Proposed Fine Art and Industrial Exhibition in Manchester.—The *Manchester Courier* says that suggestions have of late been thrown out in local art circles as to the desirability of holding an art exhibition in Manchester on a scale commensurate with the importance of the district. The multifarious forms in which art has of recent years found development, however, impose the condition that an art exhibition, if it is to be truly representative, must take a much more comprehensive range than that of paintings and water-colour drawings, and that to meet the expectations of the present generation it must include art in whatever form it may find expression, whether on the painter's canvas, in the embellishment and decoration of the mansion, the works of the sculptor and the potter, the skill of the carver and metal worker, or in any of the numerous other forms, to which of recent years it has been applied. The chief difficulty in the way of holding such an exhibition has been that of finding a suitable building for an exhibition of so comprehensive a nature, and it was not until recently that the gentlemen who have interested themselves in the matter could see their way to overcoming it. The erection of the St. James's Hall, however, has pointed the way out of the difficulty, and arrangements have been concluded for holding the exhibition in the above hall in the months of October and November next. Several of the best-known firms connected with art-manufactures have undertaken to become exhibitors. The services of Mr. Alfred Darbyshire have been secured as an art director, who will arrange and superintend the collection, and Mr. W. Ogden has been appointed to fulfil the duties of secretary.

The Ancient Monuments Bill. — In the House of Lords, on the motion for going into Committee on this Bill, the Marquis of Salisbury said that, as the Bill interfered very seriously with the rights of property, the House ought to have some assurance that the schedule had been framed by competent authority after due inquiry. The Lord Chancellor, in reply, said that the Bill had been for several years successively before Parliament, and had been very carefully considered by the Office of Works. He had reason to believe that the Bill was the result of an arrangement which had been come to by all persons interested in ancient monuments. Lord Talbot de Malahide expressed approval of the measure, which did not, however, go as far as he could wish. Most countries had a law for the protection of their ancient monuments. A few years since there was an attempt, which had proved most successful, to extend this law to Ireland. By this means pre-historic monuments, both lay and ecclesiastical, in Ireland had been secured from destruction. The Rock of Cashel he might mention as one of the relics of antiquity which had been preserved. The House then went into Committee on the Bill. The various clauses were agreed to with amendments. On the schedule, the Marquis of Salisbury moved to exclude from it an ancient monument, the property of the Duke of Richmond, who had expressed himself as perfectly willing and able to protect the relic from destruction. The Lord Chancellor opposed the amendment, which was negatived.

The Welding of Cast Steel.—At a meeting of the Royal Scottish Society of Arts, held on the 31st ult. in Edinburgh, Mr. Benjamin Aitken, foreman smith, read a paper on "The Welding of Cast Steel." The ordinary method, he remarked, of welding cast steel was to heat it a very little more than blood red; if heated much above that it would break off or crumble away, and thus become useless. In welding cast steel they must have some flux that would have an ameliorating influence on the steel, and allow it to be heated up to a welding heat, and at the same time retain its form and quality. After alluding to various compositions used for this purpose, including Drake's, which was sold at some 35s. per cwt., he said it had been discovered that stucco, which sold at 3s. 6d. per cwt., answered the purpose admirably. In using it they must be careful not to let the steel be too highly heated before applying the stucco, and always be careful to form the flux as early as possible. He had found that by this method steel not only retained, but in many instances improved, its quality. Several examples of steel welded in the manner described were produced and favourably commented on by the meeting, and a committee was appointed to report on the paper.

A Ship Canal through the Mull of Kintyre.—The Duke of Argyll was present on the 25th ult. in Glasgow at a large and influential meeting of gentlemen favourable to the improvements of the east and west lochs of Tarbet, in the county of Argyll, and to the formation of a canal between the two lochs. The proposal submitted to the meeting was to form a canal through the Mull of Kintyre, and thereby provide a direct outlet for shipping traffic from the Firth of Clyde to the west and north of Scotland. His Grace, who presided, explained that the canal would be two miles in length, and the saving it would effect for vessels going to the west and north of Scotland would be about 115 miles. The channel was proposed to be 50 ft. in width and upwards of 18 ft. in depth, and the cost was estimated at from 150,000*l.* to 200,000*l.* Calculations have been made showing that vessels to the amount of about 500,000 tons a year are expected to take advantage of the canal, and, estimating the charge for the use of the canal at 6d. per ton, this would give a revenue of 12,000*l.*, which was considered a good return upon the outlay. Resolutions were afterwards passed in favour of the formation of the canal, and a large and influential committee was formed to carry out the undertaking.

Opening of Wanstead Park.—On Tuesday afternoon Wanstead Park, lately acquired by the Corporation of the City of London, under circumstances which we have already mentioned, was formally and unostentatiously opened by the Epping Forest Committee. The park consists of 182 acres of low-lying wild common land, formerly the property of Lord Mornington's trustees, and is situated between the southern extremity of Epping Forest and the northern portion of Wanstead Flats, so that in point of fact it forms a southern continuation of the gigantic metropolitan playground opened in May last by her Majesty the Queen. It is not, however, intended that the unrestrained liberty enjoyed by the public in their use of the Forest shall be as completely extended to Wanstead Park, which is meant to be used simply towards the means of such enjoyments as may be found and permitted in the London parks.

Destruction of Pollok Castle by Fire.—On Monday night Pollok House, the residence of Sir Hew Crawford Pollok, at Newtonmearns, near Glasgow, was entirely destroyed by fire. The building, which was oblong in shape, was in the French Renaissance style of architecture, and was erected about 200 years ago. An addition was made to the structure by Sir Robert, and in 1856 a further addition was made by the late Sir Hew Pollok. The house was four stories in height. The fire is supposed to have originated in the loft which occupied the top of the house, and it is conjectured that it must have been caused by the ignition of several birds'-nests which had been built in the chimney leading to the dining-room. Owing to the inadequate supply of water, little could be done to arrest the progress of the fire. The loss, which has been roughly estimated at 30,000*l.*, is partially covered by insurance.

The "Heathen Chinee" Again.—In New Zealand, as in California, the Chinaman abounds, and there, too, he has to resort to strategy to make good his position. It is related that in Otago, where Scotchmen are in a majority of the colonists, a contract for grading a road was to be let, and the lowest bid was signed "M'Pherson." Notice was sent to the said M'Pherson to meet the Board and complete the contract. In due time they met, but behold! M'Pherson was yellow in hue, and had an unmistakable pigtail. "But," gasped the President, "your name can't be M'Pherson?" "Allee lightee," cheerfully answered John, "nobody catch um contlact in Otago unless he name Mac." The contract was signed, and the Mongolian M'Pherson, it is stated, did his work as well as if he had really hailed from Glasgow.

"Prizes" to Architects.—The Guardians of the Kidderminster Union, addressing architects and "builders," invite plans, with estimates of cost, for increasing the present workhouse premises at Blakebrook, Kidderminster, so as to accommodate 420 inmates. They say "Prizes of 25*l.* and 15*l.* respectively will be awarded for the first and second best plans, but no remuneration will be paid to any person competing beyond such prizes." Estimates are required. The cool impudence of the invitation [illegible] be justified by the fact that there will [illegible]rsons to respond to it.

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Progress of the Inner Circle Railway Completion.—On the 21st ult. a train was run for the first time on that portion of the Inner Circle Railway which lies between Aldgate Station and Trinity-square, Tower-hill, which is about a third of the whole line that is to be constructed to complete the Inner Circle. After the meeting of the Metropolitan Railway Company, at the Three Nuns Hotel, Aldgate, a special train was in waiting at the Aldgate Station, for the chairman and directors, the Lord Mayor, Mr. Alderman M'Arthur, M.P., and such of the shareholders who wished to inspect the line. The station at Trinity-square, which was reached in about two minutes, was gaily decorated with flags. On Tower-hill a marquee had been erected, in which luncheon was served. Sir Edward Watkin presided, supported on his right by the Lord Mayor, and on his left by Mr. M'Arthur, M.P.

Meeting of Bricklayers in Birmingham. A general meeting of bricklayers was held on Tuesday in the Temperance Hall, Birmingham, under the presidency of Councillor W. J. Davis, for the purpose of considering in what way the organisation connected with the trade might be improved. Among those who addressed the meeting was Mr. E. Coulson, general secretary of the Bricklayers' Society. On the motion of Mr. G. Harris, seconded by Mr. W. Nash, a resolution was adopted expressing belief that the principles of trade-unionism had conferred unlimited benefits on the bricklayers of the country, and conduced materially to their well-being, and urging the bricklayers of the district to unite with the bricklayers' societies in Birmingham.

Gateshead: Opening of New Board Schools.—A public meeting to inaugurate the opening of the new schools just completed in South-street, Durham-road, Gateshead, was held on the 20th ult. The new buildings stand in a densely-populated and rapidly-increasing district. The schools are arranged in three departments for 284 boys, 284 girls, and 310 infants, and in addition there are two rooms for pupil teachers' classes for thirty each, the total accommodation provided being for 940 children. The cost, as completed, has been 4,150*l.*, or near 4*l.* 10s. per scholar (the architects' estimate to the Board being 5*l.* 5s.), and the works have been finished in two months less than the specified time. Mr. Edington has acted as clerk of the works; the contractor being Mr. Alexander Thompson, of Gateshead; and the buildings have been erected from the designs and under the superintendence of Messrs. Oliver & Leeson, architects, Newcastle.

A Domestic Exhibition, which will include scientific apparatus and domestic appliances, grouped under the headings of the dwelling, foods, clothing, and water-supply, is fixed to be held at the Alexandra Palace during the autumn of the present year. It is announced that steps are being taken by a committee for the purpose of holding a Conference on Domestic Economy in connexion with the Exhibition.

The National Association of Master-Builders of Great Great Britain held its half-yearly meeting on Wednesday, the 26th July, at the George Hotel, Nottingham. The president, Mr. Stanley G. Bird, occupied the chair, and several matters of importance to the building trade were discussed. It was arranged to hold the next half-yearly meeting at Liverpool.

A Threatened Strike Averted.—Notices were posted on Saturday at Festiniog slate quarries, announcing the reduction of four hours weekly in the hours of labour. This is the result of a conference between a committee of the workmen and employers, and the compromise has averted a threatened strike of 9,000 men.

Exhibition at Trieste.—An Industrial and Agricultural Exhibition was opened at Trieste on Monday last by Archduke Charles Louis, who, in reply to an address read by the president of the exhibition, expressed the pleasure which it gave him to thus personally convince himself of the great progress made by Austrian products in recent years.

Reconstruction of the Philharmonic Theatre.—We understand that the plans prepared by Mr. Frank Matcham for the reconstruction of the Philharmonic Theatre at Islington have been passed without alteration both by the Metropolitan Board of Works and the Lord Chamberlain, and that the work is to be commenced forthwith.

Water Supply.—Mr. Stephen Harding Terry, C.E., an Inspector from the Local Government Board, has held an inquiry at St. Thomas the Apostle, near Exeter, relative to an application from the Local Board for sanction to borrow 600*l.* for works of water supply, viz., raising and covering the service reservoir. The plans were explained by Mr. Samuel Churchward, surveyor to the Local Board. No opposition was offered to the scheme, as to which the Inspector intimated he should report favourably. The Inspector then closed the inquiry, and proceeded to visit the reservoir and water-works in company with the chairman and surveyor.

Willenhall.—At the fortnightly meeting of the Local Board, on the 31st ult., a report was presented by the Sanitary Committee in which they stated that after thoroughly inspecting the land for the proposed sewage-farm, they had instructed the surveyor to make a plan in accordance with their views; and they further recommended the Board to empower the committee to take the necessary steps for the purpose of obtaining the land marked on the plan, containing 30 acres 3 roods and 35 perches, if possible by agreement.

TENDERS

For house at West End Lane, Kilburn, for Mr. Thomas Hobson. Mr. Henry John Hansom, architect. Quantities by Mr. H. Smith:—

Messrs. B. Cooke & Co.	£3,050 0 0
B. E. Nightingale	2,991 0 0
J. D. Hobson	2,783 0 0
Lathey Bros.	2,730 0 0
John Grover	2,724 0 0
William Smith	2,695 0 0
Stimpson & Co.	2,660 0 0
Thos. Gregory	2,642 0 0
H. J. Dainton	2,630 0 0
Richens & Mount	2,580 0 0
Turtle & Appleton (accepted)	2,550 0 0

For new roads, sewers, and surface water drains for the British Land Company, Limited, on their Tottenham estate. Mr. Henry B. Michell, surveyor:—

Rayner, Pinner	£3,743 0 0
Harris, Camberwell	2,885 0 0
Killingback, Camden Town	2,650 0 0
Dunmore, Hornsey	2,526 0 0
Pizzey, Hornsey	2,525 0 0
Keeble, Regent's Park	2,400 0 0
Jackson, Leyton	2,333 0 0
Wilson, Walthamstow	2,312 0 0
Peill & Sons, Bromley	2,295 0 0
Bloomfield, Tottenham (accepted)	2,100 0 0

For alterations and additions to Lolham House, Upper Clapton. Mr. H. Shaw, architect. Quantities by Messrs. Stoner & Sons:—

Dabbs	£465 0 0
Boyce	429 0 0
Barber & Lutwyche	390 0 0
Harper	375 0 0
Shurmur	360 0 0

For erection of new church, Aberaman, near Aberdare, for Sir George Elliot, Bart., M.P. (labour portion only). Mr. E. H. Lingen Barker, architect:—

Coleman Bros., Chaxhill	£1,348 0 0
Shepherd, Cardiff (accepted)	1,055 0 0
Wilkins & Williams, Aberaman	1,010 0 0

For the erection of a private residence, Chiswick. Mr E. J. May, 3, Great James-street, architect:—

Adamson & Sons (accepted)	£1,650 0 0

For the erection of a dwelling-house, with coachhouse and stable, at Rutland Park, Perry-hill. Mr. J. W. Garrood, architect:—

Hollidge & Stewart	£927 0 0
Clark	912 0 0
Ruffle	870 0 0
Kemp	840 8 0
Watson	750 0 0
Walker	733 0 0
Nicolls	718 0 0

For roads and sewers, South Park Estate, Wimbledon. Mr. George Pooley, surveyor:—

Wm. Carter, Anerley	£1,610 0 0
Edmund Iles, South Wimbledon	1,597 0 0
Wm. Nicholls, Wood-green	1,413 0 0
Jas. Bloomfield, Tottenham	1,412 0 0
Jas. Mildenhall, South Wimbledon	1,216 0 0

For additions to National Schools, Lee-common, Great Missenden. Mr. Arthur Vernon, architect, Great George-street, Westminster. Quantities by Mr. E. C. Richardson:—

Fincher	£755 0 0
Luckett	634 10 0
Silver	628 0 0
Swain	609 0 0
Taylor & Grist	563 10 0
Wallis	535 8 0
Cooper	518 0 0
Landon	500 0 0
Woollams	498 10 0
J. Ingram (accepted)	495 0 0
Johnson	471 19 4

For additions to Bower Dean Farmhouse, High Wycombe. Mr. Arthur Vernon, architect:—

Swain	£246 0 0
Loosby	217 0 0
Harris	210 0 0
Smith	208 10 0
Nash	204 10 0

For the erection of new premises in Abchurch-lane, King William-street, for the London and Provincial Fire Insurance Company, Limited. Messrs. Davis & Emanuel, architects:—

Foster & Dicksee	£8,988 0 0
Ashby & Horner	8,592 0 0
David King & Son	8,500 0 0
Colls & Sons	8,476 0 0
John Mowlem & Co.	8,393 0 0
Kirk & Randall	8,359 0 0
Lucas Bros.	8,324 0 0
Geo. Trollope & Sons	8,183 0 0
John Grover	8,163 0 0

For sewage purification and disposal works for the Leyton Local Board. Mr. J. C. Melliss, engineer:—

Botterill	£9,849 0 0
J. Bell	9,743 0 0
Saunders & Son	9,459 10 0
M. Gentry	8,250 0 0
Ford & Everett, Westminster*	7,912 15 11

* Accepted.

For the erection of dwelling-house for Mr. John Perry, Ramsgate. Mr. E. L. Elgar, architect:—

Smith & Son	£1,250 0 0
W. H. Port	1,185 0 0
H. Bowman	896 0 0
White Bros.	875 0 0
T. Elgar	850 0 0
Newby Bros.	827 0 0
W. Martin	824 0 0
C. Home	777 0 0
B. J. Cowell (accepted)	770 0 0

For the erection of new schools, &c., for the guardians of Thingoe Union, Bury St. Edmunds:—
Geo. Grimwood & Sons, Sudbury (accepted).

For additional single rooms, &c., Norfolk County Lunatic Asylum. Mr. R. Makilwaine Phipson, county surveyor. Quantities not supplied:—

	Rooms.	Water-closets, &c.
Barnard	£2,114 0 0	£182 0 0
Wilkins	2,104 0 0	187 0 0
Bailey	2,075 0 0	185 0 0
Newell	2,049 10 0	170 0 0
Hall	1,990 0 0	162 0 0
Hawes	1,900 0 0	160 0 0

For the second portion of the restoration of Lambston Church, Pembrokeshire. Mr. E. H. Lingen Barker, architect:—

G. R. Jones, Haverfordwest*	£175 0 0
T. Jenkins, Carnrose	168 0 0

* Accepted.

For two new shops, Gun-street, Reading, for Mr. T. Paget. Mr. W. Ravenscroft, architect, Reading. Quantities by Messrs. Cooper & Sons, Maidenhead and Reading:—

Rider & Son, London	£2,558 0 0
Margetts, Reading	2,417 10 0
Kimberley, Banbury	2,400 0 0
Higgs, Reading	2,280 0 0
Bottrill, Reading	2,215 11 0
East, Reading	2,214 10 0
Searle, Reading (accepted)	2,138 0 0

For rebuilding 214 and 215, Tottenham-court-road for Messrs. Hewetson & Milner. Messrs. Batterbury & Huxley, architects:—

M. & F. Smith	£2,526 0 0
Manley	2,467 0 0
Nightingale	2,192 0 0
Holliday & Greenwood (accepted)	2,169 0 0

For rebuilding 184, Hackney-road, for Mr. E. Jones. Quantities by Mr. R. Stark Wilkinson. Messrs. Gordon & Lowther, architects:—

Richardson Bros.	£1,989 0 0
Larter & Son	1,951 0 0
Jackson & Todd	1,849 0 0
Steele Bros.	1,794 0 0
Taylor & Parfitt (accepted)	1,639 0 0

For the erection of a pair of detached residences at Walton-on-Thames. Messrs. Giles & Gough, architects:—
W. T. Niblett, Benwell-road, Holloway (accepted).

For repairs and fittings, 69, Aldermanbury. Mr. R. Dexter, architect. Quantities by Mr. J. Sargeant:—

Forrest	£1,186 0 0
Gregar	1,137 0 0
Loveday	972 0 0
Gentry	959 0 0
C. Sharpe	900 0 0

For wall and sewers at the Kensington Cemetery at Hanwell, for the Kensington Burial Board. Mr. Edward Monson, jun., Grosvenor House, The Vale, Acton, Surveyor to the Board:—

	Contract No. 1.	Contract No. 2.
	£ s. d.	£ s. d.
Wilkinson, Bros., Finsbury Park	733 13 0	914 3 0
J. E. Baxter, Walham Green	800 0 0	700 0 0
Jenvey & Aldridge, Rotherhithe	723 4 0	728 2 0
Jesse Jackson, Leyton	770 0 0	670 0 0
Joseph Mears, Hammersmith	786 3 11	638 18 6
W. Crockett, St. Pancras	836 0 0	588 0 0
G. Torkington, Chelsea	836 16 0	577 18 0
Joseph Dorey, Old Brentford	765 0 0	630 0 0
T. Huntley, Loughborough Junction	678 6 0	717 12 0
C. Maton, Kew	749 0 0	619 0 0
J. Bloomfield, Tottenham	862 0 0	498 0 0
W. Ashfold, Slough	654 0 0	668 0 0
Cowland & Co., Bayswater	708 0 0	610 0 0
H. S. Pollard, Burdett-road	740 0 0	575 0 0
A. T. Catley, Lloyd-square	748 0 0	542 0 0
Rogers & Dickens, Golborne-road	655 0 0	624 0 0
H. R. Swain, Bedford-row	749 0 0	507 0 0
M. W. Rowles, Acton	760 0 0	*457 0 0
Thos. Nye, Ealing	648 0 0	547 0 0
Geo. Gibson, Southall	*576 0 0	596 0 0
John Cardus, Acton	632 0 0	539 0 0
Jas. Pizzey, Hornsey	655 10 0	510 0 0

* Accepted.

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New schools and offices at Burghley-road, Kentish-town, for the School Board for London. Mr. E. R. Robson, architect :—

Scrivener	£10,697	0	0
Boyce	10,350	0	0
Roberts	10,154	0	0
Cox	10,137	0	0
Williams	10,034	0	0
Lawrence	10,021	0	0
Shurmur	9,945	0	0
J. Grover	9,916	0	0
Manley	9,796	0	0
Wall Bros.	9,699	0	0

For the erection of premises at 344, Bethnal Green-road. Mr. Wall, architect :—

Higgs	£3,826	0	0
Boyce	2,730	0	0
Smith	2,189	0	0
Eldridge	2,160	0	0
Morter	2,050	0	0
Shurmur	1,944	0	0
Sharman	1,760	0	0
Forest	1,686	0	0

For alterations and additions to the Bell and Hare public-house, Tottenham, for the City of London Brewery Company. Mr. W. J. Jewhurst, architect :—
Shurmur (accepted).

For new warehouse, 146, Narrow-street, Limehouse. Mr. Charles Dunch, architect. Quantities by Mr. J. F. Wesley :—

Abraham	£1,155	0	0
Harris & Wardrop	1,154	0	0
Salt	1,081	0	0
Taylor & Parfitt	1,035	0	0
Johnson	1,027	0	0
Chafin	990	0	0
Shurmur (accepted)	963	0	0

For "Haslemere House," Sutton, Surrey. Mr. W. K. Appleton, architect. Quantities by Mr. F. T. W. Miller :—

Howard & Dorrell	£2,887	0	0
Longley	2,800	0	0
Hall, Beddall, & Co.	2,740	0	0
Smith	2,735	0	0
Humphries	2,723	0	0
Lawrence	2,715	0	0
Clark & Bracey	2,693	0	0
Holloway	2,690	0	0
Shurmur (accepted)	2,484	0	0

For alterations, &c., Hoxton Schools, for the managers of Aske's Charity. Messrs. Snooke & Stock, architects :—

Carless	£1,745	0	0
Greenwood	1,596	0	0
Shurmur	1,593	0	0
Pritchard	1,590	0	0
Wells	1,559	0	0
Rider	1,558	0	0
Steele	1,519	17	0
Wallsby	1,495	0	0

For the erection of new schools for 1,040 children, Newport-road, Leyton, Essex, for the Leyton School Board. Mr. J. T. Newman, architect, 2, Fen-court, Fenchurch-street. Quantities supplied by Messrs. R. L. Curtis & Sons :—

J. Holland	£8,995	0	0
J. Marsland	8,635	0	0
Jackson & Todd	8,549	0	0
J. Parrish	8,399	0	0
Jones & Co.	8,318	0	0
A. Reed	8,185	0	0
C. Cox	8,181	0	0
Vernon & Ewens	8,145	0	0
Hearle & Son	8,083	0	0
J. Morter	7,868	0	0
W. D. Tink	7,773	0	0
North Bros.	7,750	0	0

For sundry repairs to No. 1, Highbury-mews, Holloway-road, for Mr. Hobern. Messrs. Gordon & Lowther, architects :—

Burrows	£375	0	0
Larter & Son	339	0	0
Richardson	336	0	0
Steele Bros.	299	0	0
Durnford & Langham	298	0	0
Taylor & Parfitt	297	0	0
Long	265	0	0

For proposed new studios at 5, Elm Tree-road, St. John's Wood, for Mr. A. A. Calderon. Mr. H. A. Rawlins, architect :—

Taylor & Parfitt (accepted)	£539	0	0

For house and office, Hays Common, Bromley, Kent, for Mr. H. Hoskier. Mr. T. E. Collcutt, architect. Quantities by Mr. Jas. Gandy :—

	Estimate.	Alternative.
Trollope & Son	£3,583	£139
Booth & Son	3,490	157
Taylor & Parfitt (too late)	3,299	119
Nightingale	3,180	133
Crossley	3,070	120
Lawrence	3,005	120
Laslett	2,997	110
Julian Ennor	2,990	120
Smith	2,963	106

For repairs and painting required to be done to the premises 9, Serjeants'-inn, Fleet-street, for the Colonial and Continental Church Society :—

Macey	£516	0	0
Andrews	462	0	0
Smith & Co.	559	0	0
Perkins	407	0	0
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For the erection of new chancel, organ chamber, and vestry, at Riverhead Church, Kent. Mr. A. W. Blomfield, M.A., architect :—

Geo. Punnett & Son	£2,245	0	0
Durtnall	2,195	0	0
Goddard & Son	1,965	0	0
Wiltshire	1,950	0	0

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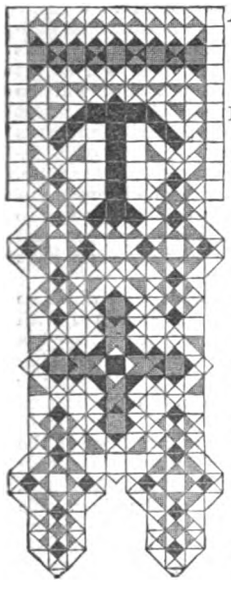

American Activity among the Ruins of Assos.

THE Archæological Institute of America has published the first series of its classical papers, an octavo of 200 well-filled pages, liberally and handsomely illustrated. It consists mainly of a Preliminary Report of Investigations at Assos during the year 1881, the first year's work of an expedition sent out by the Institute. This is written by Mr. J. T. Clarke, who was assisted on the site more or less constantly by three architects, three graduates of Harvard College, chosen from numerous applicants, by Mr. Eliot Norton as volunteer, and Mr. J. S. Dillon, who furnishes a report on the geology of Assos and the Troad. Mr. W. C. Lawton contributes notes on the inscriptions found, and general archæology. The pioneers took the British Museum and Louvre in their way, and by the middle of April were settled at work well supplied with instruments, a library of 400 volumes, general apparatus, and,—not least important,—canned food. The work was carried on far into November, with as little interruption as was allowed by Turkish officialism, fast of Ramadan, and holidays of Greek saints. It speaks highly not only for the resources but also for the energy at command, that so much was done in the time, and that so explicit a report of what was done should so soon be given to the world. When it is added that not only is this investigation to be continued, and the general results embodied in a monumental work, but that the leading American colleges are already engaged in establishing a permanent school of Classical studies at Athens, upon the model of those of France and Germany already active there, it is impossible not to feel that the New World is repaying its obligations to the Old with admirable zeal. It is perfectly comprehensible that the Old World may experience a slight movement of apprehension at the prospect of losing the lead in such enterprises; the enterprises will be the gainers if emulation is thus stimulated. In the meantime, cordial greeting is due, and be it paid, to laudable and well-directed exertions; what also is due is careful study of such reports as that now before us, with a view to gather, and if it may be, also to give instruction or suggestion at least as to the precise information that is expected with most interest.

The name of Assos is familiar from its occurence in the Acts of the Apostles. St. Paul, on his way from Macedonia to Jerusalem, left his companions at Troas to go on by ship round Cape Lecton and take him up at Assos, whither he proceeded across the promontory on foot. About half way he would leave the temple of Apollo Smintheus,—lately recovered for art by the Dilettanti Society,—between him and the sea just before the road turned inland. The surveys and views given in the report exhibit his course as he approached his journey's end and the view that presented itself. He must have crossed the Greek bridge over the river Satnioeis, of which the piers, very artfully constructed with doubly-joggled courses to resist the sudden force of a swollen stream, still remain; he was then not half a mile from the street of tombs that led by a gradual rise to the principal gate, or, skirting the town, descended by a very steep incline,—"the steepest and stoniest imaginable,"—to the port. The Satnioeis is separated from the gulf to the south throughout its course by a long narrow mountainous belt, precipitous towards the sea; the plain which it waters, thus confined on one side, is far smaller than that of the Scamander northwards, but was celebrated in antiquity for its fertility. Assos was thus truly a city on the Satnioeis, and Mr. Clarke argues with much force that it is to be identified with the Pedasus, which Homer refers to as a seat of the Leleges on that river. The political history of Assos is all but a blank; it is not enumerated among the tributary allies of Athens. After her fall, it is found in the occupation of a Persian satrap, Ariobarzanes, who is in cordial alliance with her enemies, the Lacedæmonians, and he even abets the projects of Agesilaus against the great king, from whom, in concert with other satraps, he ultimately revolts. He seems to have obtained the command of the entire Troad as well as of Phrygia; his statue was found prostrate on the acropolis of Ilium when Alexander the Great visited it, and an omen for his enterprise,—favourable, of course,—was drawn from the circumstance by his ever serviceable diviner Aristander. After this the most interesting incident connected with Assos is the residence there of Aristotle with his friend, the tyrant Hermeias.

The acropolis of Assos is formed by the crater of a volcano, which was choked by a second flow of trachyte, the city being built upon a lower but still elevated plateaus around it. The summit was crowned by the temple which it was the main object of the expedition to examine; "the peak rose so steep that, standing within the peribolus of the fane, one could look down into the holds of the vessels in the port beneath, and so high that the foundations of the temple were at an elevation half as high again above the sea as are the finials of the slender spires of Cologne above the Rhine, or the apex of the great pyramid of Gizeh above the Nile" (p. 80).

This temple is remarkable as being the only Doric Greek temple in Asia Minor, except one of quite late date at Pergamon. Additional interest attaches to it, moreover, from certain peculiarities in the treatment of the style, which are open to be interpreted as either provincialisms or marks of an intermediate stage of development. The site and ruins had been described by many travellers before 1835, when M. Texier was commissioned by the minister Guizot to study the antiquities of Asia Minor, and made the examination which led to the removal of the sculptured slabs which are now in the Louvre. These are engraved and described, together with the architecture of the temple, with such detail in the vast work on the results of his expedition, published at the expense of the Government, that further exploration might at first seem needless. But Texier, unfortunately, acquired a repute as endowed with a special talent for inaccuracy, from comparison of his work in other more accessible places, for instance, at Old Smyrna (p. 10), and this more than justified a plan for going over his work again, and would have done so even had there been no other additional work to be done in the neighbourhood. It must be sadly said, after perusal of the present report, that even the best friends of the late so genial architect and archæologist will serve his memory best by accounting and apologising, as well as they may, for his deficiencies rather than by vain attempts to disallow or extenuate them. Even a compatriot, M. Perrot, characterises the plan which he gives of another site as "*une mauvaise plaisanterie;*" at the same time, it is apparent that Texier took none of the pains of a practised impostor, as he in all frankness mentioned the short number of hours which had sufficed to put him in possession of materials for such a display of minute information. This candour, no doubt, betrays a mischievous light-heartedness which artists and archæologists who take matters seriously will not be inclined to encourage, and can only condone with an effort. The following inaccuracies fill out certainly a formidable indictment. The remains show the orientation of the building to have varied considerably from the east to the south; Texier places it thirty degrees to the north of its true direction. The temple has only two steps, the French elevation shows three; the width of the building, given there as 13 mètres, is, in fact, 14·035 on the stylobate and 14·585 mètres on the lower step. These errors are particularly unlucky, as it is precisely in the three points of dimension on plan number of steps, and orientation, that the temple coincides so remarkably with the Theseum at Athens. "The excessive sack-like entasis of the shafts, which has given rise to so many wild theories, did not exist." "The mouldings indicated by Texier as existing above the frieze are wholly imaginary; corner blocks of the corona proving this were found, while

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the constructive impossibility of interposing a continuous band of trachyte of only 0·106 mètres (=4 in.) thick, between the mighty stones of the Doric entablature is evident from the French restoration itself,—scaled though they are there to the millemètre as if accurately measured.

Now every item of this indictment may be true, we fear must be; indeed, we do not doubt is positively true; but even so we object to the introduction into the discussion of terms which do not advance the particular discussion in hand, and tend to heat tempers to a degree unfavourable to renewal of discussion on other points. Texier, after all, rendered services which should exempt him from contemptuous treatment. The most moderate expostulation, we are sure, will induce Mr. Clarke to wish unwritten and desire to withdraw imputations of "deliberate falsification" (p. 107), and "unparalleled effrontery;" may we add also to give credit to his predecessor less grudgingly for his correct recognition of a sculptured architrave,—an anomaly which it tried him so severely not to be able to get his architectural friends and colleagues at Paris to fairly submit to examination. However, the severity of the present explorers may not be without one valuable result if it helps to commit them to the extreme of scrupulous completeness as well as of conscientious accuracy in their own drafts and comments.

From the reference to the Theseum it will be seen that the temple was on a small scale; its length on flank did not exceed the breadth of the Parthenon. Not a single drum of a column remained in position, but when the remains of the stylobate were cleared of earth, not only were the weathered traces of the flank columns found, but the position of the cella wall was shown by fine lines indicating its outer edge, engraved on the stones which formed its foundations, and continued on some surfaces of the natural rock which came up to the level. These incised foundation stones were returned at the back of the naos opposite to the second flank columns, thus showing a quite unusual absence of what, antithetically to the pronaos, has been called the epinaos, a blind but open recess between antæ.

The study of Greek architecture involves twofold functions which are analogous to those which occupied the earlier astronomers; the investigation of the theory of the ancient designers must be based upon a collection of accurately-measured details of the ancient designs; it is, of course, very difficult for the speculative to withhold from framing hypotheses as to the principles of great artists, even while allowing the insufficiency of materials; the insufficiency of the materials may, indeed, only be discovered by the failure of repeated and persistently varied attempts to divine their secret, to wring from them the explanatory hint which will not only bring what facts are already in possession into order, but also guide all further explorations. But as in astronomy, the theorist must at last wait for the observer, or must himself be content to undertake the functions of an observer, before he can hope to indulge himself to any good purpose in his beloved speculation. Newton himself had to set aside his theory of the lunar system until more perfect records of past observations came to his hands. When Mr. Penrose undertook the survey of the Parthenon it was an incalculable advantage that the principle of application of curvature had already been recognised in some of its leading lines, and warned that it might be expected in others; but otherwise it was with as much wisdom as self-restraint that he carried through his work of minute measurement without disturbing himself at the time by endeavours to frame an ulterior theory as to the schemes of proportion which the original artists relied on and worked by.

Mr. Clarke, in his preliminary report, supplies a certain number of dimensions of the Doric temple, and incidentally institutes a comparison of them with a view to identify "a unit of measure employed in the building." His observations imply that he expects to find that principal dimensions,—as, for instance, the length and breadth of the naos, the width of its door, thickness of wall and diameter of column, and so forth,—were set out by a foot-rule, and that a comparison of the dimensions of these parts will betray the relation of this particular foot to the metrical system. Should this prove to be the case, it would prove that the architect of the temple of Assos, whatever might be the case with his contemporaries, worked upon a very different system to the architects of the Parthenon. Mr. Penrose found that the standard Greek foot measured most accurately the breadth of that temple on the top step, a breadth of 100 ft.; but it was much if he could detect its direct application to a single dimension of a leading division or detail elsewhere. An examination of the figures supplied by Mr. Clarke go far to show that it was the same at Assos. The foot-rule, as we all know, is the norm of all modern construction. The standard foot and its subdivisions measure off accurately all parts of a building and of every article of furniture within it. The contrast, therefore, of ancient and modern methods is most decisive; the ancient method of proportional evolution, of which the theory and its application have been fully made out in the case of the Parthenon, has received there its fullest justification. How far it is applicable at present is a question; it may be a bow of Ulysses which demands heroic powers to bend it. To what extent it was applied at Assos may prove to be difficult to ascertain; but, at least, there are certain glimpses of it.

It is noticeable, says Mr. Clarke, that the width of the side and rear of the pteroma (that is, of front and flank colonnades) is as nearly as possible 1-10th of the length of the stylobate; this relation of the most important divisions of the plan, he justly assumes, excludes, by its striking exactness, the assumption of a coincidence; but his farther assumption must be paused upon. He continues,—"It is hence extremely possible that a system of decimal feet was employed, or that 3·0335 mètres contains an entire number of the original unit of measure." The length of the stylobate is 30·335 mètres, which is assumed to be 100 ft. of 0·30335 metrical. The difference between this and the 0·308211 of Boeck is, indeed, but small, 0·00486=3-16ths of an inch.

But the Greek foot, as determined by Mr. Penrose, equals 1·01341 of the English foot (=0·30479 mètres), and by this proportion the Greek foot equals ·308866; which may be taken as coincident with the hundredth part of the length of the lower step of the temple at Assos, 30·885 mètres.

It seems, therefore, more probable that the primary dimension of the temple was set out upon this longest dimension of the plan.

Still, it is remarkable that it is on the top step, more properly the stylobate, that we find established the definite and simple proportion of length to breadth which is usually provided in the plans of Greek temples. 13 : 6 :: 30·335 length of stylobate : 14·001 to compare with 14·035, the measured breadth. The difference equals as much as 1½ in. nearly, but this may not be enough under the circumstances of the ruin to vitiate the inference. In the Parthenon a simple proportion, 4 : 9, is established as here, on the stylobate; in the Theseum, which otherwise has so much resemblance to this temple, on the lower step. There are six columns in front and thirteen on the flank, which seems to have suggested the proportion given to the stylobate; there are, in consequence, five intercolumns on the front and twelve on the flank. Had the columns been spaced equally, front and flank, the oblong of their lines of centre would have had the proportion, 5 : 12. As it is, the actual proportions of the stylobate alone oblige the columns, if we should not rather say were adopted to enable the columns, to be spaced more openly on the front than on the flank.

From the length of the stylobate...	30·335
Deduct one diameter of column...	0·915
	29·420

29·420÷12=2·451 for average flank columniation.

From the breadth of the stylobate...	14·035
Deduct one diameter of column.....	0·915
	13·120

13·120÷5=2·624 for the average front columniations.

If the columniations by the angles were contracted absolutely, that is, independently of greater dimension being given to the angle columns, those intermediate would, of course, be still further widened; and this relative extension would be greater in the case of the front columniations, already abnormally wide.

The difference between the two sets of average columniations (2·624−2·451=0·173 is as much as between 6 in. and 7 in.

Unfortunately the stylobate is so entirely destroyed at both ends, that all evidence of spacing of the angle columns is so far lost. This is an example of the too frequent disappointment of excavators, — the unlucky failure of testimony at critical points; the breaking short off of a clue precisely where perplexity is greatest as to which turning to take, which alternative to decide on. It only remains for the explorers to check a murmur, be thankful for what has escaped destruction, and to take care that what evidence can be recovered is at least done full justice to. The loss of the stylobate on both fronts leaves us without direct information whether the columns at the angles were of ordinary or enhanced diameter, and whether the adjacent interval on the front followed the rule of those on the flank, and was uniform with the others beyond it, or whether it was reduced in span in accordance with the practice in other Doric temples. A chance still remains for obtaining a solution of this problem. It seems likely that between the results of the present expedition, and that of the French, all the architrave stones, of one front at least, have been recovered. We may expect that in the promised "monumental publication" of the Americans the accurate details and measurements of each stone will be set forth; the angle architrave stones will be betrayed by including a complete gutta tablet or regula at one extremity, and if the lengths of the others are uniform, they will mark intervals from centre to centre of columns. So, again, it is possible that careful dimensions of all the capitals found may exhibit some as so far exceptional in breadth of abacus and diameter below echinus, that they must have belonged to stouter columns.

Had Texier examined the capitals which he recovered, and after a fashion measured, with a little more care, he would have escaped a sharp rebuke from his successors for overlooking one quite unexampled peculiarity; the flutes or channels, of which there are only sixteen, finish upon the lowest annulet of the necking, and here by their relation to the faces of the abacus they betray the curious fact of being set, not with centres of channels, but with arrises parallel to the axis of the building. We must, however, still await a specific report whether this disposition of the flutes was unvaried both on front and flank.

It was by another very unusual arrangement, as we have seen, that the walls of the naos westward were returned without any recess or epinaos, and at the same distance from the columns as on the flank. On the proper front the antæ of the pronaos ranged with the third flank column, precisely as in the Theseum, Parthenon, and numerous other examples.

The interior of the cella measures approximately 17·865 by 6·765, which gives the long proportion, accurate to between 2 in. or 3 in., of 3 by 8. No indication was found of this apartment having been divided by a cross wall, yet it seems strange that a mosaic pavement, which we should expect to find was just in front of the place of the statue, should have been restricted to the half of it nearest to the entrance. It is composed of black and white marble cubes, and is hypothetically ascribed to a late restoration. But the border is less suggestive of the developed wave ornament than of the spirals of Mycenæ and Orchomenos; and the alternate diamonds of the centre, white and black between white and black borders, accord rather with primæval than with the later taste, of which a good example is given in a mosaic from the gymnasium.

It is stated that the shafts of the columns are without entasis, and it must be accepted as proved that they were destitute of any such exaggerated curvature in profile as Texier exhibits; but it is not quite clear whether Mr. Clarke appreciates the difficulty of determining the existence or non-existence of entasis when only the unmatched scattered fragments of different columns have to be dealt with. A reference to the appendix of the fourth part of the "Antiquities of Ionia" will help to explain this; Mr. Penrose there sets forth in detail the calculations and comparisons by which he certified at once the height and the entasis of the columns of the temple of Athene Polias at Priene.

The height of the column seems not yet to be certainly decided; but as shown,—and any error must be but trifling,—it is a little less slender than that of the temple at Ægina; like that, it is nearly equal in height to half height of the façade, and thus, at least, comes nearer

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to the Attic principle of giving it an excess than to the Sicilian Doric. It is more openly spaced than the Theseum or the Æginetan hexastyle; a difference which rather exaggerates the heavy effect of the entablature. The type of the capital is most especially archaic in its flatness and projection; already at Ægina a decided approach was made to that erectness of profile of the echinus, which brought this member in Athenian architecture into perfect harmony with the composed and dignified character of the style.

Minor peculiarities of the entablature are the omission of guttæ, the alternation of broad and narrow mutules accordingly as they surmount metope or triglyph; the triglyphs above columns were also narrower than the intermediate ones. The absence of guttæ may be most probably a true omission, but the variations of mutules and triglyphs, so far as not due to the contingency of termination at the angle, are doubtless to be regarded as instances of arrested development; of a pause in that progress to full discipline of all the elements of the order, which ultimately established a canon of uniformity that trusted for relief to refinement of outline and elegance of enriched details, sculptured or coloured.

The most startling divergence from general treatment of the order is in the bold sculpture bestowed upon the architrave. This has been long known from the very good engravings of Texier; the American explorers have discovered several in addition, including some very important portions of the series. The consideration of these is a subject apart. As matter of architectural history it would be interesting to know,—but the knowledge is likely to elude us,—whether this treatment followed established precedents or was an original departure from the better practice of a perfectly plain architrave which happily became universal, or nearly so. The Nereid monument of Xanthus, in Lycia, seems to have had a sculptured architrave, but this Ionic structure is of much later date. It is remarkable that the Lycian antiquities supply another parallel in a bold series of sculptures of uncertain application,—boars and lions and other animals and satyrs in the same crouching position to enable them to range,—which is given to a Hercules at Assos.

This notice, however, is now quite long enough for what only professes to be a preliminary report. We shall await with interest the completed details that are promised, and further results of continued exploration of remains which Colonel Leake considered to present the most perfect idea of a Greek city that is anywhere obtainable.

Geologists will be interested in the report, which may be studied in conjunction with the valuable essay of Professor Virchow on the geology of the Troad. As regards inscriptions found, a bronze tablet has been preserved to show that there was a period when the citizens of Assos could strain the usual conventional sycophancy of an address,—it is to "the God" Caligula,—from fulsomeness to profanity. It is pleasanter to turn from the craven invocation of "the Saviour and God Cæsar Augustus," to another inscription which preserves a more honourable expression of natural sympathy engraved below the bas-relief of a dog; the following is a literal translation:—

Anaxeus here has his playmate the dog Parthenope buried;
Such for the solace she gave giving requital in turn.
Even for dogs has affection its meed, as now also has this one,
Still to her master attached, here been allotted a tomb.
Looking hereon, make thyself a true friend, who, with zealous affection,
Will, as he loved you in life, care for you also when dead.

Penzance Scientific and Industrial Exhibition.—A Scientific and Industrial Exhibition is to be held in Penzance just after the close of the Royal Cornwall Polytechnic "Jubilee" Meeting at Falmouth. The Exhibition is projected for the purpose of bringing together a display of apparatus and products illustrative of the modes of working and results attained in the various departments of science and industry. Examples, models, diagrams, or descriptions of obsolete or disused machines or processes possessing historic interest, will be eligible for exhibition; but the committee more particularly desire a collection of the most approved modern appliances in use at the present time. It is proposed to open the Exhibition on Monday, the 25th of September, and to keep it open during one week. Short lectures, descriptive of some of the exhibits, will be given at intervals.

GENERAL ART-EDUCATION.

The phrase, "art-education," implies two distinct forms of cultivation; the instruction in the art of delineation or shaping, whether in drawing on the flat or in modelling surfaces, and the more decisively intellectual power of conceiving forms and ideas, and of truly appreciating and understanding already existing creations of art. If we were to put it in a more epigrammatic way, we might say that art-education was concerned either in teaching us to draw what we see, or to see what we want to draw. The latter expression is illustrated by the story of Fuseli saying to a student who was looking vacantly before him, "What do you see, sir?" and on receiving the answer, "Nothing, sir;" rejoining, "Then you ought to see something, sir; you ought to see before your mind the form you are intending to draw, and if you do not you will never be a painter." Fuseli, it is certain, saw before his mind's eye occasionally very strange shapes, and it would have been well for him if he had looked a little less at them and a little more at the material facts of Nature, which he said "put him out." But for all that there is truth in his remark, as indicating how the mind, in original composition, should command the pencil, and not trust to the pencil, in its gyrations on the paper, evolving an idea. The same criticism was made by Mr. Street, in one of his lectures, in regard to architectural drawing. To see some people draw, he said, you would suppose that they looked to the pencil to guide them, instead of their own will guiding the pencil.

These two sides of artistic attainment,—the power of drawing what is seen, and the power of original production, stand on a very different footing in their relation to the powers and the requirements of the mass of the people. To expect the power of original production, in a sense that would be worth anything, from any but a very small minority of mankind, would be out of the question even with the most perfect system of artistic instruction. Few men, either writers or artists, have really original ideas; the majority among them who succeed to a respectable extent merely repeat previous ideas in a slightly modified form, with more or less of their own manner of execution; and even manner of execution is copied from others, consciously or unconsciously. Many works so produced may be very agreeable in themselves, and give legitimate pleasure to many people, but they have no permanent value, and do not last beyond their own day. The power to produce even these, however, requires the same degree of technical instruction as is required to make a great and original artist: the training must be given to all who feel moved to seek it, the genius will show itself where it exists; training cannot evolve it, but can only furnish it with the power of expression.

Even those, however, who can produce independent works which are not characterised by originality of genius and of manner, are a minority in regard to the mass of mankind; at all events, this kind of power even is not acquired without almost entire devotion of time and energy to it, which cannot be given except by those who intend to live by it, or who are of independent means. To the majority outside of these lines a training in art has another kind of value. It is a means of education, of calling out faculties of the body and mind which would otherwise lie dormant, of opening sources of intellectual pleasure, and of giving, by means of the power of drawing, a more accurate perception of the forms of objects, and a capacity for representing and describing objects in a manner far more direct and more universally intelligible than any written description can be. This practical value of drawing, it is needless to remark, has been borne witness to by not a few employers of labour, who have given it as their experience that a workman who could draw and could properly understand a drawing, was always more capable, more useful, and better able to understand his instructions than one who could not. The practical value of drawing may be recognised, even apart from its operation on the understanding, in its power of promoting greater delicacy of manipulation in operations quite apart from that of drawing in itself. One of the best amateur artists of the day, as is well known, is an eminent surgeon, who has declared that he first took up etching because it was a recreation which would have the effect of rendering his hand more delicate for his important professional work. One of the best remarks in regard to this result of training in drawing was one we heard given by a lady who was a candidate for a School-board election, and was asked somewhat indignantly, by one of her working-class constituents, what was the use of teaching drawing in the Board Schools to girls who were going into service, for instance, and why their education was not confined to things that would be useful to them in their future life? The reply given was that there was no more common complaint against female servants than about their clumsiness in handling fragile things, such as glass and china, and their continual breakage of such articles in consequence; and that a training like drawing would probably do more to render the hands more safe, careful, and sensitive in touch, than any other influence that could be named. The lady who made this sensible and shrewd answer, on the spur of the moment, we are glad to say, gained her election, and is now an active member of a large School Board. Of course, it might have been said in addition that a knowledge of drawing would give a domestic servant even greater advantages than that, in providing her with a more interesting and sensible occupation for her leisure times than flirting with "policeman X"; but the answer cited in favour of drawing was perfectly true as far as it went, and probably the best practical reply to the style of criticism which evoked it.

It is the comparative prevalence now of this idea of drawing as an educational influence on the mind and the hand, which has led probably to the wide-spread change in the ideas of art-instructors and of educated persons generally in regard to the manner in which drawing should be taught at schools or to children at home. The idea of education in drawing, in the days when men now in middle life were at school, consisted in the production of copies of landscapes or of heads, executed by pupils who knew nothing of the anatomy of the head, nothing of the perspective or of what may be called the construction of the landscape, and made to look presentable, or what was supposed by parents and guardians to be presentable, by the touching up of the master. This idea of drawing is certainly not extinct yet, but it now only lingers in second-class schools and in families where there is no pretence of understanding or caring about art, save in a merely perfunctory manner. The influence of the principles the promulgation of which is more due to the teaching of the South Kensington Schools and of their branch schools in various parts of the country, than to any other source, has permeated far and wide, and has to a great extent revolutionised the artistic training given in our schools.

The essence of the change which has come about is this,—that it is now recognised that learning to draw does not mean merely learning to copy on one flat surface the marks on another flat surface; in other words, making a drawing from another drawing, but that drawing means the power of representing on a flat plane any object or group of objects that is placed before the draughtsman, and that no one can be said really to draw who does not understand how to represent the outlines of any object, however complicated, by lines on a sheet of paper, put in not by the lucky help of a natural quickness of the eye, which may at times enable a pupil to draw what looks right by a happy chance, but in accordance with a definite and scientific knowledge of the relation of appearance to reality, and of the method of representing this relation on paper. That is the one-half of the now recognised truth about artistic instruction; and the other and equally important half of it lies in the recognition of the fact that no study of Nature at second-hand, from a "first," "second," or "third" drawing-book, can give real training in the knowledge of what Nature really is, and of the beauty, delicacy, and infinite variety of natural forms; that Nature must be studied seriously and zealously from her own realities, and not from copy-books; and hence that to draw one sprig or flower correctly from Nature is more to the purpose, and teaches more, than to draw a whole landscape from a flat copy executed by another hand. The latter process neither teaches drawing nor teaches a knowledge of Nature; it only teaches a trick of hand which can be mechanically repeated. The study of a fine landscape-painting by means of copying it has, of course, as far as it goes, the same sort of value in relation to the superior landscape-painter's art which it has in relation

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to Nature; it gives the student an insight into the manipulation of colours, and teaches him how the greater painter produced his effects, just as the study of Nature herself teaches him how Nature produces her effects, and how to reproduce them. But the modern system recognises that even the greatest landscape-painter's work is only a translation from Nature, not to be studied with a view of understanding Nature herself, but with a view of understanding the painter and his method, and perhaps of learning from his work something about the way of studying Nature, and the means by which some of her effects may be reproduced, and gaining some new hints to be turned to account in the student's own studies from Nature.

Thus, at the present moment, the idea of instruction in drawing is a much more serious one than in the days when pupils made sketches and masters furbished them up. The best instruction in drawing is now directed to insuring that the pupil thoroughly understands what he is doing, and why he is doing it; that he understands the meaning of each line that he makes, and the construction of the object which he draws, and that his eye for form, proportion, and perspective is cultivated step by step as he proceeds. The system adopted in the South Kensington first-grade drawing-books, which we noticed some time ago, is admirably calculated for this object of making the pupil think, and exercising mind, eye, and hand simultaneously. In those books the effort is made to prepare the student for drawing from actual objects, and at the same time to supply to some extent the training of eye and hand which such drawing furnishes, and to lead up to it by examples and a method especially selected for those ends. The student is exercised first in drawing simple geometrical forms which cultivate in him the perception of size and contour and proportion, as well as neatness and accuracy of hand; and both in these and in the more advanced and difficult objects which present problems in perspective and foreshortening, the invariable rule is that the copy shall be made on a different scale from the original: so that nothing can be measured or mechanically copied. It would be difficult to imagine any system wider apart from that on which the so-called teaching of drawing was once based in even our best schools, and the gradual and increasing adoption of such a system as this cannot but have a most notable result on the general power of drawing among the rising generation of children who are put through it.

In regard to this subject of art-instruction some very interesting information is put together in a little book by Mr. Hulme,* whose name is known to our readers in connexion with some able works on artistic design, especially in relation to the adaptation of floral forms in art. Mr. Hulme's book gives his general ideas as to what art-instruction should aim at, which are in the direction of that scientific method of which we have been speaking; and gives a brief account of the system pursued at various important educational establishments in different parts of the country. The information given in this portion of the book gives an account of the method pursued at the Board Schools, the University Local Examinations, at the various military and engineering colleges, at the leading public schools, and in the more theoretic professional teaching at the Universities; and at such more specially artistic schools as the Royal Academy, the Slade School, the South Kensington School, and the Institute of Architects,—the latter referring, of course, to the work appointed for prizes and medals, as the Institute is not an instructing body otherwise than in this sense.

It is surprising and satisfactory to learn from this interesting *résumé* how prevalent now is the scientific system, as we may call it, of teaching drawing, in the principal educational institutions in which it is taught. We find evidence that in almost all these instances, where drawing is taught, it is taught upon a fairly good method and on sound principles. The defects of the old system or want of system appear to survive mainly in the smaller middle-class schools, where naturally reform in such subjects is slow to make its way. Probably the reform would be accelerated not a little if it were once fairly recognised that there is a practical value in the power of drawing, for men who are in trade and commerce even, and that it is not a mere elegant accomplishment for ladies and gentlemen. In the larger public schools, such as Eton and Rugby, the mistake is that drawing is only voluntary, although it appears to be well taught to those who desire and seek to learn it. As Mr. Hulme says, few schoolboys are likely to do anything voluntarily in the way of work. And as drawing taught on the scientific method really is work and not mere trifling with brush or pencil, it may be surmised that only a very strong turn for drawing on the part of the pupil, or the direct orders from home on the part of the parents, lead to the filling up of the drawing class. Among University men of the present day, from which class most or all of the masters at our large schools are recruited, there still linger the remains of the old superstition, that drawing should be an "extra," somewhat like dancing; an elegant accomplishment, not to be put on a level with classics and history and other serious studies. The next generation of schoolmasters will probably know better themselves; to those of the present generation it may be urged that drawing is a most important element in mental and bodily training, and that up to a certain point, that is to say, as far as concerns the practical handling of the pencil and the practical power of copying an object when seen, and of representing in correct perspective an object which it is desired to represents,—so far as this, drawing can be almost as certainly taught generally as writing, and ought to be so as a part of every man's education. The question of artistic feeling in the higher sense is a different one; it only exists at all in a portion, perhaps a minority, of boys and men; though a preliminary training in practical drawing might not infrequently bring out evidence of latent artistic taste where it would never have shown itself or been suspected had not the capability for the expression of it first been imparted. The true solution of the problem for general schools would be, as Mr. Hulme observes, a compulsory class supplemented by a voluntary one. The elements of drawing, scientifically taught, should be as much a compulsory subject as grammar or writing; and when once this is established we should not have the curious spectacle, which we have sometimes seen, of a great publishing firm, which would on no account publish bad and ungrammatically-written books, being quite willing, nevertheless, to publish books containing illustrations violating the first rudiments of the grammar of drawing and perspective, and seeing nothing to be ashamed of in this; and after the course of a few generations of compulsory teaching of drawing, people will read about the men who could not draw in the present day, as we now read about barons and knights and gentlemen of old time who could not write their names. When the elements of drawing are once made compulsory, then the voluntary class of drawing could be filled by those who have shown such special aptitude and developed such a love of art as to render it desirable that their talent should receive further cultivation, even if it were at the expense of some of what are now considered more regular school studies. There ought to be an effort to make some such distinction in reference to special tastes and powers as boys rise higher in a school, and the head authority should surely take some general survey of the reports of the under-masters, and see whether these indicated any special aptitude which could be developed within the machinery of the school. Mr. Hulme quotes a significant instance of a case where he gave a boy's character as "in every respect admirable; most sorry to lose him;" while a master in another department endorsed the same boy's papers, "uniformly idle and indolent; so long as this apathy continues he cannot hope to succeed in anything." As a fact the boy succeeded as an artist, and a comparison of the two reports might have led a discerning Head to see that; in reality, the boy had special aptitudes which it was worth while specially to cultivate, and which the pupil himself was probably cultivating as well as he could. Another point Mr. Hulme touches upon is the questionable position in which the art-instructor still often finds himself in relation to the other masters of the school. This is one of the old superstitions. We can remember when at school that, while every other master who had not the prefix of "reverend" enjoyed the "addition" (as it was called in Shakspeare's day) of "esq.", the teacher of drawing, who was a trained artist, and, as a teacher, in advance of his day, appeared in all the school-papers as "Mr. ——" only! This would now, we hope, be called snobbish; but it is only fair to remember that there is another side to the matter, in regard to the freedom and equality of social intercourse among the masters at a school. As far as the purposes of social life go, general culture, especially that of University life, does give a polish of mind and manner such as art-training by itself certainly does not necessarily give; and it is for the art-masters to take heed that they do not neglect the general culture of their minds in the special study of their own subject. This is certainly the case in some instances, and it is impossible that a man who lets himself run in one groove in this way can take with ease a place in social life along with men of broader culture.

The first chapter of Mr. Hulme's book, which gives his general views on art-instruction in schools, should be read by those interested in the matter; it contains a great deal of good sense, and little that we should be disposed to call in question or to dissent from, and there are many very useful hints for the consideration of those who are called upon to instruct beginners in drawing. One remark we may quote, on account of the practical exemplification it gives of the value of collections of casts, if only as stimulants to a love of art. Their presence, the author says, is always an advantage; the merest beginners learn something from looking at them, and are led to anticipate the time when they may be able to draw them; and he was struck by the spontaneous remark of a cabinetmaker who was doing some repairs in the class-room, and who looked round at the head of Zeus, the Parthenon frieze, and the Venus of Milo, and said, "Ah, sir, what would I have given when a boy to have even worked at my trade in the same room with these!"

* Art-Instruction in England. By F. Edward Hulme, F.L.S., F.S.A. London: Longmans, Green, & Co. 1882.

THE CONTRACTS OF CORPORATIONS.*

There is probably no legal question which more clearly shows the necessity for a code of English law than that of the rights and liabilities of corporations on contracts not entered into under seal. It might be possible to set the whole matter at rest in comparatively a few sentences; but it remains one of the most doubtful questions which can be considered by a lawyer. Mr. Pollock, in his admirable work on the law of contracts, concludes his remarks on this subject by saying,—"It is much to be wished that the whole subject should be reviewed and put on a settled footing by the Court of Appeal, and that those cases which are already virtually annulled should be expressly declared to be no longer of authority." We would, indeed, prefer to see the matter settled with many other legal questions by a code which should have received the sanction of the Legislature. But as the subject is one which largely interests the readers of the *Builder*, and as, indeed, many of the decisions which have been given on the subject have arisen out of contracts for some kind of building or plumbing work, or in respect of the supply of materials, it may not be amiss to state in a few words how the subject now stands. The old law was, that a corporation could not enter into a binding contract except under their common seal, and though such a practice has been declared by a well-known judge to be "a relic of barbarous antiquity," we are by no means sure that a hard-and-fast rule such as this is not the most satisfactory. It may often cause hardships; but as every one knows the rule, any one who enters into a contract with a corporation without it being sealed does so carelessly, and cannot be pitied if he suffers for his heedlessness. But this rule soon became relaxed, to the extent that contracts as to small matters of daily necessity need not be under seal, from what has been termed "the principle of convenience amounting almost to necessity." Thus, for example, when a municipal corporation were the owners of a graving dock in which ships were placed in turn,—the dock being, in fact, let to the ship-owner by the corporation for the repair of vessels,—and a ship entered the dock under the ordinary unsealed agreement, some breach of contract took place, and the Court de-

* There was a question lately in the *Builder* as to the right of a corporation against the contractor. These abstract questions can seldom be answered without misleading the questioner who has not stated the facts of a case; but probably the following short general sketch as to the contracts of corporations may be useful.

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cided that, though the contract was not under seal, yet this did not prevent it from being a binding one. The ground of decision was the principle already stated, the agreement for the safety of the ship being an act of daily necessity to the Corporation. It is clear, indeed, that to go through the formality of sealing a contract each time a ship might wish to enter the dock, perhaps for a short examination of its condition, would be obviously and inconveniently absurd. But the exception to the rule in regard to trading corporations has been placed on a much wider footing, for all contracts made in the ordinary course of business are valid without being under seal. This exception was finally declared to be the law in the year 1869, in a case in which, said Chief Justice Cockburn, the Court was asked to hold that the old rule as to corporations contracting under seal applied to corporations constituted for the purpose of trading; the contrary, however, was now, he stated, to be considered as settled law. So that in this very case, when a colliery company contracted with an engineer for the erection of a pumping machine and engine for use in the colliery, and paid him part of the price, and he refused to deliver the machinery in question, it was held that the company could maintain an action against him. Conversely, if the company had received the engines and had not paid the engineer for them he could have sued the company for their price; or again, if the company had refused to take the engines, and the engineer had suffered damage in consequence, equally he could have maintained an action for breach of contract. But the consequence of this decision is that a number of cases to be found in the legal reports must be considered as practically overruled, whilst another and opposing series must be considered as good law. Thus, on the one hand, a decision that in an action for the non-delivery of iron pipes to a waterworks company, the contract was invalid not being under seal, is a wrong judgment; and one, that in an action against a gas company for the supply of meters it was immaterial that the contract was unsealed, must be considered as correct. So much for the law as regards trading corporations, where the exception is now so broad as to be almost a rule, but where difficulties often arise in deciding whether a certain contract is incidental to the general course of the business of the company.

There is, however, much greater difficulty in regard to contracts of non-trading corporations. In regard to some of these it is clearly settled that a contract is invalid unless under seal, and that is when by the Act of Parliament under which they have come into existence they are bound to make contracts under seal. Thus a local board, which is a sanitary authority under the Public Health Act, must, in order that its contracts may be valid if they are in respect of agreements above a certain value, have them sealed. But if even such corporation had made an important contract not under seal for the construction of drains and sewers, had paid for them on the completion of the work, and they had turned out to have been made badly and improperly, on the principle that when a corporation has done its part of the contract it may sue on it though not under seal, an action would lie against the contractor, though he could not sue the corporation if they did not pay him that which was due. This is, no doubt, a hardship, and the mere fact of so many existing exceptions to the general rule makes the oversight of a contractor in not having a sealed contract less blameworthy than it would otherwise be.

But, again, there are other non-trading corporations, such as guardians of unions, whose contracts are not strictly ordered by Act of Parliament to be in writing, and here there is a still stronger contrast between the cases, which have, curiously enough, never yet been reviewed by the Court of Appeal. The exception, however, seems still to hold good, so far as regards contracts for work to be done or goods supplied in order to carry out the purposes for which the corporation exists, and where the work has been done or the goods supplied. Thus, in a case which has always been regarded as the leading support of this proposition, water-closets were erected at a workhouse by the direction, and with the approbation, of the guardians, and Mr. Justice Weightman, in a lengthy, able, and elaborate judgment, decided, on the above principle, that the plumber was entitled to recover for this work. This case was approved in a more recent decision, in which the facts were that coals had been supplied to a workhouse; and, on the other hand, there exists an important case in which extra works executed, but not ordered under seal, also again for the guardians of a poor-law union, were decided not to be such as could be paid for unless under a sealed contract. It is true that this decision was given before that of Mr. Justice Weightman, but it cannot be said that, so long as it remains not actually reversed by a Court of Appeal, the law can be stated to be certain and without doubt. "It would, perhaps, have been better," said Mr. Justice Weightman, in the Cuckfield Union case, "and have avoided the uncertainty which now exists, if the old rule had never been relaxed." But the relaxation was made under pressure of what may be considered as practical and common-sense justice; and there is little doubt, we think, that, when possible, courts of law will endeavour to do substantial justice, even though the contract may not be under seal. The law is, however, very calculated to mislead contractors and others, because whilst they may recover, as we have seen, against some corporations for work done and goods supplied, yet against others which have, under recent Acts of Parliament, certain powers placed in them, they cannot so get their money because the Act of Parliament has a stringent proviso as to contracts being under seal. Our readers may remember that within the last two months we called attention to the case of Young *v.* the Corporation of Leamington, who were an Urban Sanitary Authority, and against whom the contractor was held to have no right of action. If, on the contrary, he had done work at the poor-house for the parish, undoubtedly he could have successfully maintained an action. Such an anomalous state of the law is intolerable. Either the judicial exceptions to the old rule are founded on a wrong principle, or else the Public Health Act, and any other Acts which contain similar clauses, are too stringently framed. That contractors do not as a body take some steps to have them considered certainly surprises us, because, having such strong judicial decisions to support them as are contained in the cases relating to unions and other corporations, they have good ground for saying that these Acts require amendment. It, no doubt is in the public interest that public contracts in which public money is spent should be as carefully prepared and executed as possible; but when public officials enter into contracts which should be sealed, and are not sealed, and so a contractor who has done work is unable to recover his just debts, although he would be able to do so against almost any other but a regular municipal corporation, then some kind of fine should be inflicted on these persons. If some such proviso were inserted in the Public Health Acts, it would be not only a defence to the public, but guard contractors against the carelessness of public officials whose duty it is to see contracts under these powers carried out in the manner which the Legislature has directed.

THE RAILWAY MOVEMENT OF 1881.

Although the railway returns for 1881 are not yet issued, an abstract containing some of their leading features is given in No. 29 of the Statistical Abstract for the United Kingdom. The general upshot is that while gross revenue has increased by 101*l.* per mile, or from 3,411*l.* to 3,512*l.*, working expenses have increased in a higher ratio, or from 1,877*l.* to 1,902*l.* per mile. The net result,—1,610*l.* per mile,—is varied to 1,744*l.* per mile by receipts for miscellaneous items, against 1,893*l.* per mile in 1880; and the average cost per mile, which in 1880 was 40,613*l.*, has risen in 1881 to 41,000*l.*

Thus the net earning on capital, which, in 1880, was 4·38 per cent., sank in 1881 to 4·27 per cent., which is almost exactly the average return since 1860,—the first year in which the data requisite for the calculation were given in the "Railway Returns." But the volume of traffic has risen, in this period of twenty-two years, from 2,661*l.* to 3,512*l.*, per mile, or by 31 per cent. The capital cost per mile has risen during the same time from 33,368*l.* to 41,000*l.*, or by nearly 23 per cent. The difference between these two increments, half of which, to say the least of it, might have been expected to be net gain, has been exactly swallowed up by the increase of the working expenses.

The steady increase of the capital cost per mile from 1863 (when it was at its minimum of 32,804*l.*) to 1881, (when it had reached 41,000*l.*), has been forty per cent. in eighteen years. In the former year the great trunk lines of railway were, as a rule, completed; and the branches and subsidiary lines which have since then been added to the system ought, it might have been supposed, to have been constructed at a lower price, thus lowering the average cost. Such has been the case with the well-arranged railways of France, which, in 1867, had cost 28,592*l.* per mile, a figure which was reduced by 1877 to 25,780*l.* per mile. In this latter year the goods and passenger mileage receipts in the two countries were equal, viz., 2,887*l.* in France and 2,881*l.* in England,—which latter amount was raised by the mineral traffic to 3,686*l.* It is difficult to understand the difference of the movement in the two countries, unless it is to be traced to the disastrous effects of non-remunerative traffic in England. The average return of net earning on capital in France, which, in 1841 was 3·11 per cent., has risen to 5·56 per cent. in 1877; while in England, as has been seen, it has not in 1881 exceeded the mean for the whole period under return.

Regarded by the light of this historic progress, the decline of a little more than 2¼ per cent. (from 4·38 to 4·27) in the earning power of the English railways for the year 1881 is somewhat alarming. No rule of business is more generally admitted than that profits increase as the volume of business increases. It is quite intelligible why this should be the case. Fixed charges, which are little affected by the increase of traffic, are spread over a larger area, and thus the same price leaves much more profit for 200 than for 100 units of sale. In France, the increase of volume from 2,741*l.* per mile in 1867 to 2,887*l.* per mile in 1877 was attended by an increase in earning power of from 5·10 to 5·56 per cent. The Belgian railways, on the other hand, have, by constant increment of their capital cost, been brought into a condition verging upon bankruptcy. Experience is of no value at all if facts of this grave nature do not lead the English shareholders to demand fuller and more businesslike accounts than those with which Parliament has been content. And this is more signally true when we reflect that the figures above given cover all the railways of the United Kingdom. Among them are to be found some of which the advance is as rapid and satisfactory as on the French lines. If we compare the net earnings on capital in two distinct groups of English lines, we shall find this strikingly manifested. The average net earnings on capital of the London and South-Western, the London, Brighton, and South Coast, and the South-Eastern Railways in 1871, together with that of the Metropolitan Railway in 1874, were 3·66 per cent. In 1880 the average net earnings of the same lines were 5·15 per cent. on capital,—an improvement of property at the rate of 40·6 per cent. in nine years. The average net earning power of the London and North-Western, the Great Northern, the Midland, and the North-Eastern Railways in 1871 was 5·89 per cent. In 1880 it had sunk to 5·20 per cent., showing a depreciation of value on the whole aggregate capital of these companies of 11·7 per cent. in nine years.

If this very glaring contrast, illustrated as it is by the returns of the French railways, does not stimulate the shareholders in the lines which are so steadily depreciating to look like men of business at what directors call their policy, it will be of little use to go to the trouble and expense of publishing any accounts at all.

Royal Associat on for the Promotion of the Fine Arts in Scotland.—The distribution of the works of art purchased for this year by the Committee of the Royal Association for the Promotion of the Fine Arts in Scotland took place on the 5th inst. in the Masonic Hall, Edinburgh, Councillor Walcot, in the absence of Lord McLaren, presiding. The chairman stated that the subscriptions received for the year amounted to 3,937*l.* 10s., a decrease on those of last year of 24*l.* 3s. The prizes, which were then balloted for, consisted of 32 works of art selected by the committee from the late exhibition of the Royal Scottish Academy, and comprised 22 paintings, 9 water-colour drawings, and 1 bust in marble. There were also 25 statuettes in statuary porcelain, after Sir John Steel's colossal statue of Burns in New York. The balloting was conducted by Mr. John Cowan, Beeslack, and Mr. Campbell Penney, C.A.

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RESISTANCE NEEDED TO THE PRESSURE OF THE WIND.

In anticipation of the next quarterly volume of the "Minutes of Proceedings of the Institution of Civil Engineers," the report of a very interesting debate on resistance to wind-pressure has just been printed, in the convenient pamphlet form customary for such productions. The debate itself has possibly more value than the original contributions,—one from an American, and one from a French engineer,—on which it was based. At all events, these papers would have been none the worse if the writers had made themselves acquainted with the articles on the subject which have from time to time appeared in the columns of the *Builder*. For example, a knowledge of the two remarkable observations which we cited (September 4th, 1880) of the force of the storms of February 20th and November 16th, 1877, at Holyhead, might have modified some of the conclusions of the writers. We have now to call attention to one other valuable contribution to the study of a question which all the speakers admit to require much study, by several gentlemen who took part in the discussion; and notably to a law approximately determined by Mr. Thomas Stevenson. What, however, renders it an indispensable duty to call attention to the debate is the fact that two of the speakers, each of them a man of admitted eminence, are reported to have made such wholly contradictory statements as to the simple mathematical formula according to which existing tables of pressure have been computed, as to be enough to perplex and confuse the student of this important subject; and that, perhaps, all the more so, from the fact that this grave contradiction appears to have been unnoticed.

Mr. Hawksley, a past President of the Institution, stated very briefly and very clearly the general solution of the problem of the relation between the velocity and the pressure of wind. Without imposing on our readers more mathematics than we can help, we may say that we have gone through Mr. Hawksley's work step by step, and fully agree with its outcome; adding only, that the table takes no note of a small increment of pressure due to the compression of the wind-current itself, which does not, however, amount to more than about 2½ per cent. at a very high velocity. The ultimate result of Mr. Hawksley's algebra is the very simple and elegant formula "$p = \left(\frac{v}{20}\right)^2$, nearly;" where p = pressure in lb. per square foot, and v = velocity in feet per second. Dr. Pole, four pages further on, gives an equivalent formula, viz., $p = \frac{v^2}{400}$ nearly, but he states this to be expressed in miles per hour.

The consequence of this, which, by itself, might be a mere clerical error, is, that Dr. Pole goes on to observe that the pressures tabulated by Smeaton are double those arrived at by a true formula, and that they are "deduced by the formula, $p = \frac{v^2}{200}$ nearly." And this is not the limit of the mischief; for Mr. Airy (p. 91) cites an empirical formula recommended by the wind-pressure commission as $\frac{v^2}{100} = p$; where v is the maximum sum of the wind in miles per hour; so that the formula seems to be based, first on the formula given by Dr. Pole, and secondly, on the assumption that the maximum velocity at any portion of an hour is double that for the average of the hour. The wholly inadequate nature of the last assumption is evident to any practical man. Mr. Rogers Field (p. 97) has shown a variation in the ratio of maximum to mean pressure, during an hour, of from 1·5 to 15·9, to 1. That being the case, it is of no small importance to be quite sure whether Smeaton's allowance is, as stated by Dr. Pole, twice that demanded by theory.

The simple fact is, that the formula $p = \left(\frac{v}{20}\right)^2$, or $p = \frac{v^2}{400}$, nearly, is correct when the velocity of the wind is calculated in feet per second; and that Smeaton's tables appear to answer to a formula which at sixty miles an hour would be $p = \frac{v^2}{203}$, with the velocity stated in miles per hour. One hundred feet per second is equal to sixty-eight miles per hour, and it is obvious that the formula must vary according to the measure of speed employed. The subject is so important to the architect that we subjoin the two tables, one that of Smeaton, generally in use, graduated in miles per hour, the other that of Mr. Hawksley, which we give as fully reliable, graduated in feet per second. We are obliged to give the tables in sequence, and not in parallel lines, as in order to do the latter, we must recalculate one of them, which then would cease to be that of the author cited, and become our own. But we may mention that the pressure at 100 miles per hour, which, according to Smeaton's table, is 49·20 lb. per square foot, according to Mr. Hawksley's formula is 53·8 lb. per foot. And we think the higher figure is the true result.

The tables are as follows:—

I.—Smeaton.

Velocity.		Pressure.	
Miles per hour.	Feet per second.	Pounds per square foot.	
1	1·47	·005	Hardly perceptible.
2	2·93	·020	Just perceptible.
3	4·40	·044	
4	5·87	·079	Gentle pleasant wind.
5	7·33	·123	
10	14·67	·492	Pleasant brisk breeze.
15	22·00	1·107	
20	29·34	1·968	Very brisk.
25	36·67	3·075	
30	44·01	4·429	High wind.
35	51·34	6·027	
40	58·68	7·873	Very high.
45	66·01	9·693	
50	73·35	12·300	A storm or tempest.
60	88·02	17·715	A great storm.
80	117·36	31·490	A hurricane.
100	146·70	49·200	A hurricane that tears up trees, carries buildings, &c., before it.

Mr. Hawksley's table is as under:—

Velocities in		Pressure in
Feet per second.	Miles per hour.	lbs. per square foot.
10	6·8	0·25
20	13·6	1·00
30	20·4	2·25
40	27·2	4·00
50	34·0	6·25
60	40·8	9·60
70	47·6	12·25
80	54·4	16·00
90	61·2	20·15
100	68·0	25·00
110	74·8	30·25
120	81·6	36·00
130	88·4	42·25
140	95·2	49·00
150	102·0	56·25

The general impression left by the discussion is pretty much the same as that which we endeavoured to enforce in our own previous papers on the subject. It was summarised by the President, Sir W. G. Armstrong, who "desired to express his strong opinion of the urgent necessity for experimental investigation in connexion with wind-pressure." There were, however, one or two contributions to the future positive knowledge of this subject which it is desirable to distinguish from calculations and arguments founded either on old or on imperfect and partial data.

Of these, that which strikes us as the most valuable accession to the general theory of wind-pressure was made by a member of an illustrious family of engineers, who may be said to have made resistance to storms their special province. Mr. Thomas Stevenson, who has already enriched science with the marine dynamometer, and with observations on the force of the sea (to which we referred when describing the principal lighthouses of our coasts), brought forward the result of researches on the law of variation of wind-pressure at different heights. In 1876 Mr. Stevenson made a series of observations on the Calton Hill, Edinburgh, with the view of determining the coincident wind-pressure at heights varying from 276 ft. to 1,600 ft. above the sea level. In 1878, furnished with a grant of 50*l.* from the Government Research Fund, he made experiments at small elevations of from 10 ft. to 50 ft. The result of his labours,—supposing it to be verified by independent observation, and illustrated by some mathematical theory of the principle underlying the law obtained,—will hereafter form a leading chapter in any exhaustive work on the pressure of the wind. It is to the effect that (when a height of 15 ft. above the surface of the ground is passed) the increase of pressure is denoted by a parabola with the vertex 72 ft. below the level of the ground. Hence Mr. Stevenson deduces the formula, $V = v\sqrt{\frac{H+72}{h+72}}$, which, for the standard height of 50 ft., at which he recommends that all anemometers should be placed, becomes $V = v\sqrt{\frac{H+72}{122}}$.

It further appeared that if x were taken as the velocity of the wind at H feet above the ground, the parameter of the corresponding parabola was $\left(\frac{x^2}{H+72}\right)$, and, as x varied, the parameter would vary as x^2, or as the square of the velocity of the gale. H and h are, of course, the heights in feet of the higher and lower stations above the ground, and V and v are the respective velocities at these levels.

It is remarkable that, in a discussion on this subject in the theatre of the Institution of Civil Engineers, due attention should not have been called to the experiments made in 1846 on the resistance to railway trains at different velocities, and to the full debates in which Mr. Robert Stephenson, Mr. Brunel, Mr. Bidder, and other engineers took part, on these experiments. Velocities of as much as seventy miles an hour were attained at that time by the locomotive; and although the results obtained were calculated in pounds of resistance per ton of train, in which shape they now form the bases of the tables in our works on locomotion, the conversion of this into pounds per square foot is not impracticable; and a verification of theory up to a very high velocity is here attainable.

Many of our readers, however, will turn with more eagerness to such remarks as apply to the resistance of definite structures to storms of approximately known violence. It is to this practical outcome that the architect may naturally be most ready to turn. Mr. E. A. Cowper, who rarely speaks on a mechanical subject without adding to the knowledge of his hearers, referred to two chimneys near Birmingham, one of which did come down in a storm, and the other did not. We wish that he had mentioned the dates; for being, in 1839, familiar with the locality, we are inclined to think that by the chimney at King's Norton, near Birmingham, he must refer to a very beautiful chimney which, in that year, stood at the Lifford Chemical Works, close to the crossing of the Birmingham and Worcester Canal by the Birmingham and Gloucester Railway. That chimney, however, was not 406 ft., but 368 ft., high. It was built of curved bricks, specially moulded for the purpose, in,—if we remember rightly,—four gradations of size. It was one of the most perfect examples of brickwork ever reared in England. The draught that it caused was enough to hold up a heavy plank, if laid vertically against an opening into a flue connected with the chimney. It answered its purpose of keeping the whole of the works free from gaseous effluvia perfectly, and the vast train of smoke which it threw, stretching for nine miles before it struck the distant hills, formed an anemometer on an unusual scale. The fall of this chimney we believe to have been due to the stoppage of the works. The fires were put out,—the draught ceased. The chimney became weak; probably the sulphuric acid and other gases had exerted an eroding effect on its materials. We saw it on one occasion bending to its fate, and on another, broken, as Mr. Cowper says. But we hold that had the works been uninterrupted the chimney might even now be standing.

We may add a curious incident which occurred at the completion of this fine chimney. The man who ascended to remove the scaffolding, having done his work, threw down the rope, and remained on the top of the stack, 368 ft. above the ground, without any means of escape! Incredible as it may seem, this is not a singular instance of absence of mind among these "Steeple Jacks," as they are called. We were not on the ground at the time, although we knew the place well soon after, and, therefore, cannot speak with certitude, but think that a rope was sent up to the man by the agency of a kite. But it was either on that, or on a similar occasion, that when all the bystanders were struck with awe, the wife of the isolated man called out to him to cut the top row of his stocking, put his knife in the foot of it, and let it unravel its way down. "It 'll haud," she

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cried, "it 'll haud sure. I knitted every stich of it mysell." And a rope was sent up by the yarn thus unravelled.

On a chimney like this, the effect of such a law of increase of velocity as that indicated by Mr. Thos. Stevenson would be notably perceived. During the erection of such a stack observations of no small value could be made; and, indeed, copper rods might be built into the outside of the tube, so as to allow of ascent for purposes of observation. According to Mr. Stevenson's formula, if there were what Smeaton calls a "pleasant brisk breeze" of ten miles an hour at 15 ft. above the level of the ground, the speed of the same wind at the level of the chimney-top would be 22·47 miles an hour, and the corresponding pressure would rise from under ½ lb. to over 3 lb. per foot, less the reduction for the cylindrical surface. This pressure, of course, is very moderate. But with a storm the increased proportion becomes very serious.

The chimney at the Port Dundas Works, Glasgow, has previously been referred to in the *Builder* as the tallest chimney and one of the loftiest masonry structures in the world. Its height is 454 ft. above the ground. If the wind were blowing, as before estimated, at ten miles an hour at the surface of the ground, its velocity at the height of the top of this chimney would be 24·59 miles an hour, and the pressure in proportion.

So important do we consider the two investigations of Mr. Hawksley and Mr. Thomas Stevenson, above explained, that we have computed a table of reference for the architect, based on the formulæ proposed. We have taken as our starting-point the velocity of sixty miles an hour at the level of 15 ft. above the ground. We very much question whether this has ever been exceeded in this country, except in such wholly exceptional cases as the architect can no more be called on in duty to provide against than he can against the not wholly impossible danger of earthquake. In any situation, however, where any evidence is forthcoming that a greater speed has been attained at this level, it will be proper to make a corresponding correction in the table. But assuming this speed, which is that assigned by Smeaton to "a great storm," we have applied Mr. Thomas Stevenson's formula to determine the coincident speed, and the corresponding pressure, at heights of from 50 ft. to 450 ft. To the pressure thus obtained we have added, in a separate column, the factor of safety of + 33 per cent. The resulting pressures are high, but we think that no physicist will venture to say that they are (if we accept the purely scientific value of the first formula, and the experimental authority of the second), unlikely to occur in such a storm.

ORIGINAL TABLE OF RESISTANCES TO WIND.

Height above ground.	Speed of wind.	Pressure.	Factor of safety.	Total.
Feet.	Miles per hour.	Pounds.	Pounds.	Pounds.
15	60·0	19·91	6·62	26·53
50	70·8	26·93	8·97	34·90
100	84·44	40·83	13·61	54·44
150	95·4	45·74	15·23	60·93
200	105·6	59·98	19·99	79·97
250	115·2	71·40	23·80	95·20
300	124·0	82·90	27·63	110·53
350	132·0	87·98	29·32	117·30
400	139·2	104·24	34·74	138·98
450	146·9	117·50	39·16	156·66

We think that the above table will be found to explain many facts that may at present be regarded as contradictory. The moment that the idea is grasped that the velocity of the wind increases with height above the ground,—a fact as to which there can be no debate, whether the increase of velocity follows Mr. Stevenson's parabola or not,—it becomes apparent that no observation, whether of speed, of pressure, of resistance, or of overthrow, has any exact value unless the height at which the observation was made be noted.

Thus in the case of the Tay Bridge, the destruction of which has given the impulse to the inquiries with which we are dealing, the height of the rails above the water was 92 ft. To this has to be added the depth of the girder, but as this was not a plate but a lattice, it would require an examination of the drawings to ascertain the mean height of the centre of exposed surface. Taking it roughly at 100 ft. above the water, it will be seen from the preceding table that the pressure at this height was 40·83 lb. on the superficial foot, if the storm was moving at sixty miles an hour at a height of 15 ft. from the ground. Now, the speed of the storm of the 28th of December, 1879, was measured at different points. The measurements all differ, but the respective heights of the several anemometers are not given. It is possible that if this were done a closer accordance would be evident than now appears. The respective shelter or exposure of each site has to be taken into account. At Seaham, near Sunderland, the speed of the wind was forty miles per hour; at Aberdeen it was sixty-three miles per hour; at Glasgow it was seventy-one miles an hour, actually rising, it is stated, in the three minutes from 7·15 to 7·18 p.m. to 120 miles per hour. Now, if, on these measurements, we estimate the speed of the gale which struck the bridge at seventy miles per hour at the level of 15 ft. above the surface of the river, the velocity of the blast of wind that struck the girder must have been close upon 100 miles per hour. To allow the factor of 33 per cent. of safety against such a blow makes the requisite strength of the structure, as against the wind, come to a resistance of between 60·93 lb. and 79·97 lb. per square foot. It is tolerably clear that if Mr. Thomas Stevenson's law had been known and accepted at the time of the construction of the Tay Bridge, a very different view would have been taken by the designer of the wind-force against which he ought to provide. And we may add that had this law been discovered between the dates of the erection and of the overthrow of the bridge, and brought before the scientific world during the inquiry which took place as to the catastrophe, a very great mitigation of the blame which the engineer took to himself would have been the result.

It will now, we trust, become apparent that our scientific knowledge on the subject of the provision that ought to be made by the architect for resisting the force of the wind is very considerably advanced by the discussion at the Institution; far more so, in fact, than in the haste of debate some of the eminent men who took part in the discussion were ready to admit. That the collection of more observations is desirable we fully agree. And we think that Mr. Wilfrid Airy put the thing in the right light when he spoke of the value of the evidence of seafaring men. The question of the breadth of the wind-waves might certainly be far better illustrated by synchronous marine observations than by any other method as yet attainable. On the other hand, any measurements of either velocity or pressure taken at sea would require very careful correction for the error due to the motion of the vessel itself. We look forward with hope, moreover, to the results of the experiments promised by Mr. B. Baker.

But while such interesting questions as those that regard the comparative pressure due to the velocity of the general storm-path across a country, and the points of intensified pressure in that general path, whether resulting from eddies or from the effect of obstacles in driving the wind into a funnel, are almost wholly unstudied, we cannot but think that it is possible to overrate their importance. Against the whirlwind or cyclone, when it assumes such a force as to lift a wagon and horses from the ground, it is clear that no strength within the limits of ordinary human practice can ever be provided.

On the other hand the specific weight of the atmosphere, which is the first element in the problem of wind-pressure, is well known. The pressure of a fluid striking a plane perpendicularly, and then escaping at right angles to its original path, is known. That being the case, there can be no question as to the general formula, which, apart from all manner of local disturbances, connects the speed of a great wind-wave with its pressure. And now that we are taught not only to look at the width, but at the depth of the wave, and to assign to each successive altitude its due increment of pressure above that stated on the ground surface, or at the normal height of 15 ft. above that surface,—by the addition of the factor of safety we consider that the danger arising from the local intensification of portions of the general wave may be adequately met,—the problem assumes a very definite practical form.

We shall be glad to receive any corrections, if such should prove needful, of the table which we present to our readers. Meanwhile we confess that the study, of which the above columns are the outcome, has given considerable relief to our own anxiety. That the architect has a more formidable enemy with whom to reckon than we have been accustomed to think, we fully admit; but the first thing is to know the exact force of that enemy, and as to that we venture to hope that by the co-ordination of the valuable work done by Mr. Hawksley and by Mr. Thomas Stevenson, we have contributed something that may be of permanent service to the profession.

THE SUBSTITUTION OF BUILDING FOR MONOLITHIC WORK:

AS INDICATED IN THE EARLIEST BOOKS OF THE HEBREW SCRIPTURES.

IN a recent article on the Tombs of the Giants (vol. xlii., p. 693) we suggested the idea that "the account of the iconoclastic reform under Hezekiah (2 Chron. xxxi. 1), when the holy places and the pillars were destroyed, unmistakably indicates the destruction of the two classes of structures known as the dolmens and the menhirs." Drawing the same inference as the above from the recent discoveries of rude stone monuments in Western Syria, the July quarterly statement of the Palestine Exploration Fund opens with a paper on the rude stone monuments of the Bible. We shall not attempt a complete abstract of a paper which is to some extent exhaustive of the inquiry, so far as reference to the Sacred text is concerned. But it may interest many of our readers to be told of some of the most definite references, in the Pentateuch and the other books of the Old Testament, to the holy places of a worship more ancient than the Law of Moses. And from the inquiry emerges a wholly unexpected light as to the religious character, if not as to the exact date, of the substitution of building proper for uncemented megalithic work.

The earliest reference to a rude stone monument cited in this interesting article is one to which we referred in our own pages (Gen. xxviii. 11). This is directly described as a makôm, or holy place, where Jacob erects, and pours oil upon a metzebah, or menhir. Captain Conder suggests the identity of the spot with that where Abraham "builded an altar to the Lord" (Gen. xii. 8); and we may add that the difference of spelling in the two words translated altar and pillar, which is only the substitution of the ע for the ץ, is one of those of which the Aramaic tongues present such frequent examples as to lead to the idea that local dialects, subsequently fused into a homogeneous speech (as in the case of sibboleth and shibboleth), were the original causes of the presence of several of quasi-duplicate letters in the Hebrew alphabet. This takes us back to the date 2175 B.C. Comparing verses 7 and 8, it seems that Abraham built two altars, the first at the makôm of Sichem, which is probably on Mount Gerizim, and the second in the vicinity of Bethel, or, more properly, Beth Elohim. About 175 years after the erection of the first altar by Abraham, Jacob (Gen. xxxiii. 20) appears to have erected, or perhaps reconsecrated, an altar on the original site near Shechem; and it is to be noted in this verse that the verb is spelt with the ע, and the noun with the ץ. Before this we have the account of the erection of a stone as a metzebah by Jacob, at the place subsequently known as Mizpah; and the accompanying ceremonial, not only of the foundation of a cairn, but of a feast, probably a sacrificial feast, on the top of the cairn (Gen. xxxi. 45, 46). Again we find the same patriarch (Gen. xxxv. 7) revisiting the makôm of Beth-el, and erecting or re-erecting the altar; and a little after (verse 14), either in the same spot, or not far from it, we find him venerating a monolithic altar (the word metzebah is repeated, with the addition, eben), at the makôm of the debir, or wood, and both pouring a libation, and pouring (the verbs employed differ as well as the nouns) oil or fat upon it. Here we have an instance illustrating the use of the cup-shaped hollow in the menhirs, as well as one, as far as we are at present informed, unique, of the festal consecration of a cairn. The erection of a pillar at the grave of Rachel would not in itself be very instructive, but is of interest if regarded in connexion with the other instances cited.

Another class of references consists of those which seem to indicate the erection of megalithic circles. Among these are cited the altar and

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the twelve menhirs, erected by Moses at Mount Sinai (Exodus xxiv. 4), where the two forms of the word occur in the same verse. The first with the ץ, and the second with the ץ. Erecting stones, which are here first mentioned as being built with lime (שיד), that is to say, set in mortar, and the erection of an altar which is distinctly spoken of as constructed of stones, in the plural, together with the prohibition to which we before referred (vol. xlii., p. 694), to cut or hollow these stones, appear to denote a wholly different phase of religious rite. The monolith has disappeared in this passage, whether as a menhir or as an element of a circle. It cannot for a moment be supposed that the change of language is unintentional, or, at least, that it is not highly significant. None the less so because, forty years later than the visit to Sinai (Joshua iv. 9), we find the single stones again used, and erected as a circle. We may observe that it is gratuitous to suppose that the stones here mentioned were no larger than a man could carry, in which case their permanence as a memorial would have been precarious. The twelve men selected by Joshua as representatives of the tribes may without impropriety be regarded as each the head of a working party, strong enough to transport stones adequate for the purpose of a monument.

For any further references, and they are many, to the erection of altars, we refer our readers to the number of the Palestine Exploration Fund's quarterly statement which we have cited, or to the sacred volume itself. The great stone mentioned in the field of Joshua the Bethshemite was apparently an ancient sacred monolith; and the stone Ezel (1 Samuel xx. 19) would appear from its name to have been a gigantic boulder, perhaps something like the "big stone" at the village of Northfield, near Birmingham, which gives its name to the rustic inn. The erection of the "Stone of help," Ebenezer, by Samuel (1 Samuel vii. 12), is, however, connected with the offering of a sacrifice.

It is, we think, undeniable that we find in the above passages references to a change in rite or worship. How early the first erection of the monoliths may be, can, of course, be only approximately illustrated by these passages. But we find the custom of erecting, venerating, and pouring libations on single stones, in connexion with makôms, or holy places, practised by Abraham and by Jacob, and we find instances of a not wholly unlike nature in the cases of Joshua and of Samuel. At the same time, in the Book of Deuteronomy we find the opposite form of building with mortar, for the sake of monumental durability, and the use of an altar, not of a single stone, but of stones; while the injunction to build a metzebah adameh, an altar of earth (Exodus xx. 24), is of the same date as the Decalogue, although the permission to rear an altar of unhewn stones (the plural is used in the Hebrew, though not in the A.V.) is appended. As to the metzebah built by Noah it may be inferred from the verb used, translated built, that it was of stones in the plural, and not a monolith. As to these delicate critical indications, however, it must be borne in mind that they may perhaps rather point to the date at which the several books of the Hebrew text assumed the present exact form than to any other note of time. When monolithic altars were in use, a writer would speak of rearing them, and when they had been displaced by altars of fitted stones, he would speak of building them, in the natural use of the words, used without any thought of the weight which might thereafter be held to attach to the one or the other verb.

It seems, however, clear that the intent of the Decalogue and of the accompaning injunctions was to prohibit the use of the monolithic altar, and that in express terms when it had been hollowed for the reception of the libations, whether of oil, of wine, or of blood, of a more ancient worship. This is in strict accordance with the injunctions in the treatise Avoda Zara of the Mishna as to matters that have been connected with idolatry. The recent discoveries in Moab have thrown a wholly unexpected light on the subject; and it is probable that we can as yet only dimly anticipate the effect that these discoveries may produce on our archæological theories, if not on the exegesis of the Hebrew Scriptures.

Building in Winnipeg.—It is reported that 5,000,000 dols. will be spent in Winnipeg this year in building.

THE ART OF THE ARABS.

It is a strange contrast that offered at this moment when our guns are thundering in Egypt,—the use of the most recent applications of modern science in the invasion of a country whose civilisation our archæologists have shown us is the oldest in the world, the parent stock from which has been developed through long generations all that we are most proud of. If it is the land of the Pharaohs that our troops have, for the second time within a century, invaded, it is scarcely of them and their times that we think now. There are those,—and, indeed, with all it is to some extent inevitable,—to whom at this moment the interest of the country we are now occupying is centred in its connexion with the great oppressors of the Israelites and their even earlier predecessors. But it is not solely their wonder-shrouded civilisation and its creations that are most threatened by the recent course of events; it is not alone the monuments of a nation which was antique and already on the decline at the hour that Abraham came forth, when the empires of Chaldea and Assyria loom up confusedly, and whose cities at the moment we commence to trace in the patriarchal life of the Bible the first formation of human society, were hoary with the centuries of their existence; it is not the monuments of those distant generations that are threatened; they have stood the brunt of time and wars age after age,—it is the more fragile creations of an art nearer our own time, more within the ken of our every-day existence.

The Egypt of to-day, if to the antiquary it is still the land of the Pharaohs, if he can still trace the resemblance of the race to the silent pictures drawn thousands of years ago on the walls of many a tomb, the land, it must not be forgotten, is in the hands of the Arabs. They it is whose civilisation has now for centuries imbued the country over which once ruled the Pharaohs. The chief artistic interest roused in Egypt has been allowed to centre exclusively round the contemporaries of the mysterious mummies which fill our museums. The course of history has given to the land of the Nile other claims to the interest of artists and archæologists besides those connected with pyramids and obelisks, sphinxes and sarcophagi, incised wall decorations, and papyri. The place held by Egypt in the history of the development of our art and civilisation has, thanks to the researches of successive toilers, since the commencement of the present century, become comparatively familiar. Greece has ceased to be regarded,—except in our educational system,—as the point of departure of our modern civilisation; the Egypt of the Israelites, so long wrapt in profound mystery, has been brought before us. Research, historic and romantic, has revealed to the artistic and literary world the Egypt of the Greeks and Romans; but in the generations that were to follow, the land of the Nile was to pass through another great and influential crisis, and, with the Mussulman or Arab conquest of the seventh century, was again to be the centre of a great artistic and civilising movement. "The first century of the Hegira," says Fergusson, "forms a chapter in the history of mankind as startling from the brilliancy of its events as it is astonishing from the permanence of its results." It is a period not so familiar, but which possesses marked interest from the direct influence its art and learning exercised on Western Europe.

It is only within the present century, as Viollet-le-Duc has remarked, that the attention of the artistic world has been directed to the various expressions of Oriental art; our conception of its creations is still inextricably connected with vague poetic visions of the Alhambra and the French colony of Algeria. M. Coste, for many years architect to the Viceroy of Egypt, was perhaps the first to study in any adequate manner the remarkable architectural marvels which the Arabs had erected in Egypt.* But M. Coste, however patient and accurate in his professional studies, may be said to have been only a pioneer on the road. The familiar studies of Owen Jones, and more recently of M. Bourgoin, are both of a more purely technical than archæological interest, but more information may be gathered from Girault de Prangey's works on Arab architecture.†

In the seventh century, Egyptian difficulties, as at the present moment, would appear to have been somewhat complicated with religious questions, for the Arabs were called in by the persecuted dissenters from the Greek Church to aid them against their more uncompromising orthodox brethren. The step was a rash one. In vain the Greek governor, Makaukas, held the field during a month; although at the head of 100,000 men, he found himself forced to treat with the invaders. "By the Almighty (replied the governor in answer to an indignant letter from the Byzantine Cæsar) how few they be, these Arabs are stronger and more powerful than we with our multitude. One man among them is worth as much as a hundred of ours, for they seek death, which is dearer to them than life." In 641 Alexandria capitulated, the Arab commander, Amr, razing the walls. The fall of Alexandria,—as Washington Irving says, in his "Life of Mahomet,"—decided the fate of Egypt. From this date, Arab art and civilisation were to flourish by the banks of the Nile.

It is difficult for us in the present day to conceive the vitality and brilliancy of this Arab civilisation when we see its existing state of collapse. In the field of literature and art the Arab world rose to a splendour which is only the more surprising as it is contemporary with the period in which Europe was still struggling in the twilight of the Middle Ages. It is impossible to imagine these conquerors from Arabia the simple wild horsemen of to-day. It has not unaptly been suggested that some undiscovered civilisation must have existed among them. In Arabia there have been found the ruins of antique monuments which the present inhabitants attribute to an epoch anterior to Mahometanism. But this is a question resting on data too vague to even approach. More mysteries than this lie in the strange rise and course of both Arab art and Arab literature; a mystery lies in many points of the double and parallel development of Mussulman and Christian art, both of which possesses many decorative symbols in common. Which borrowed from the other? We are perfectly aware that the Arabs laid the Byzantine arts heavily under contribution; they were Greek architects, painters, goldsmiths, enamellers, weavers, and embroiderers whom they employed. They borrowed also again, from the Persians, who had been the pupils of the Greeks since the time of Alexander the Great, and who, even when the national dynasty of the Arsacides and the Sassanides shook off the political yoke of their conquerors, remained under the artistic influence and were half Byzantine. The Christian art of Byzantium itself was the outcome of the disaggregated relics of the earlier arts of Assyria, Egypt, Phœnicia, and Greece, as well as the composite variations which prevailed in each of the different provinces of Asia Minor. Christian art appropriated to its use a portion of the symbols of which Pagan art had made use; it continued in a modified manner its forms and its ornamental dispositions, giving more preponderance to such features as best corresponded to its own peculiar symbolical exigencies. Arab artists acted in the same manner with respect to Christian and Persian art. Its cupolas, its arcades, its columns, Arab art appropriated to its own use. All along the line of conquest it gathered what it found in each country in which it settled, being strongly influenced by the artistic traditions of that country.

Thus the geometric ornamentation which constitutes so essentially the character of Arab art, it would be very rash to speak of as peculiar alone to its creations. Such forms are to be met with in the oldest monuments in the East, in India, in Syria, in Asia Minor, long before the appearance of the Arabs.

M. Viollet-le-Duc has urged that the term "Arab art" is open to question; historically speaking, it is very vague. We have determined, it is true, to give this name,—varied by the synonym of Saracenic,—to the art scattered over those countries conquered by the followers of Mahomet from Asia to Spain, and hence the expression is thoroughly accepted.

The moment of the Arabs' appearance on the scene in the seventh century was one of sad decline in the arts. The constructive secrets of architecture were, in many cases, almost lost;

* Coste, P.: "Architecture Arabe; ou Monuments du Kaire." Measured and drawn from 1817 to 1826. Paris, folio, 1837-39.

† Bourgoin: "Les Arts Arabes." Paris. 1873. Folio; and the same author's "Elements de l'Arte Arabe." Paris, 1879-80. G. de Prangey: "Monuments Arabes d'Egypte," measured in 1845. Paris, 1846. More recently Georg Ebers, in his "Ægypten in Bild und Wort," has given some interesting information relating to the Arab conquest of Egypt (Leipzig, 1879). An English translation of Ebers's work is now in course of publication.

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the Arabs possessed even less acquaintance with the traditions of the past. Their Greek and Persian architects found it either easier, perhaps through the ignorance of their workmen, to imitate, and especially to rob wholesale, the Romano-Christian or Romano-Persian monuments. They often used no columns, cornices, or friezes, but what they pillaged from some existing Classic work. New symbolic necessities, however, soon gave new and original dispositions to the simplest and most rudimentary artistic elements. Here lay the true Arab genius,—the power of eternally repeating in an embroidery of decoration the same line, just as in their music we find the incessant repetition of the same rhythm.

It is a statement constantly repeated, and generally accepted, that the Arab's religion forbade the representation of any living thing, man or animal. The question cannot be said to have been satisfactorily settled. It would certainly seem that, in their religious edifices, such representations were proscribed, but only after a certain date. Of the two great sects into which Mussulmans are divided, that of the Sunnites is entirely opposed to images, whilst that of the Shyites admits them. In Persia this latter sect prevails, and there its exigencies satisfied demands established by the traditions of a brilliant past civilisation.

We will pursue these observations hereafter.

EPPING FOREST.

A RETROSPECT AND A PROSPECT.

THE battle which, for something like four years, the Corporation of the City of London has been waging on behalf of the people in obtaining the preservation of Epping Forest for their perpetual use and enjoyment, was brought to a peaceful and satisfactory close on the 24th day of July last, at the offices of the arbitrators, when the final award was signed. The City Solicitor, in referring to what may be called the legal history of the forest, said, "Under the orders of the arbitrator, the conservators of Epping Forest have purchased 1,842 acres and 23 perches. The Corporation of London had previously purchased 3,554 a. 2 r. 34 p.; and to this I have to add 134 a., the balance of exchanges, making a grand total of 5,530 a. 3 r. 17 p. at an expenditure of 256,275*l.*, which in all probability will be slightly increased before the figures are finally closed."

The story that the heights and hollows of Epping Forest have to tell goes far back into the pre-historic eras. There was a time when the rhinoceros and hippopotamus rolled and swam in the muddy lagoons of the Roding and the Lea; when the elk and bison ruminated in the groves of High Beech, and the elephant and his big brother, the mammoth, reigned supreme over the wildernesses of Essex. Even at this present day, elephant-hunting is far from uncommon among the geological preserves in and around the Forest. The late Sir Antonio Brady collected many spoils of the chase, among these the teeth and jaws of mammoths of every size and age, the largest tooth measuring 10 in. in length. Geology was a science unknown to the learned Camden, who, in his "Britannia" (1610), discoursing of Essex county, quotes Ralph, the Monk of Coggeshall: "In King Richard's time were found two teeth of a certain giant of such a huge bigness that 200 such teeth as men have now-a-days might be cut out of them. These I saw (quoth Ralph) not without wondering!" Camden was sceptical, and hinted at whales; but Norden, in his "Description of Essex" (1549), writes as having seen the marvellous molars and believing in them.

There are also to be found in the Forest marked indications of the existence of man in those remote ages. Flakes, fresh as when first struck off from the flint blocks, are far from infrequent. Three superb, wholly polished celts were found last February during draining operations in the vicinity of Leyton, close to where for so many years Sir A. Brady had disinterred the bones of the mammoths.

To come nearer to historic times, Mr. B. H. Cowper, wandering one summer day in 1872 among the glades in the neighbourhood of Loughton village, came upon certain remains which seemed unquestionably to form part of an ancient earthwork, with an outer ditch or moat, and an inner embankment. The very oldest inhabitant was at fault. Nobody had ever heard of, far less seen, this relic of bygone times. In 1875 the ground was carefully surveyed by Mr. D'Oyley, of Loughton; but up to the present time neither coin nor weapon nor implement of husbandry, not even a potsherd nor a human bone, has been met with to tell when or by whom the earthwork was raised. From these mysterious mounds to Ambresbury Banks,—another ancient earthwork in the Forest,—is a pleasant walk of two miles through dingle and dell. It has been generally assumed to be a British work, though such works are not usually rectangular, as it is. On the 30th May, 1881, the Epping Forest Field Club, having obtained the permission of the Forest Committee of the Corporation, commenced to cut sections through Ambresbury Banks. The excavations occupied nine days, and were carefully watched by members of the Club. Many small fragments of pottery were found which "might be British," some which "might be Romano-British," and a fragment of a rim, hand-made, which "must be British." But these "finds" had no story to tell. We know that London, at the landing of Cæsar, was surrounded almost up to the walls by dense forests, and Ambresbury Banks,—so sayeth one legend,—was the "fortress in the woods" of Boadicea; while another claims it as the last stronghold of the Roman general Cassivelaunus.

In the year 896 the light of history first throws a gleam upon the Forest, when the Lea was much deeper and broader than now, and when the Danes sailed up it in their war-ships to Ware, and Saxon Alfred raised two fortresses to impede their return, one near High Beech and one in the vicinity of Broxbourne. As we approach the era of the Norman invasion definite mention is made of Waltham,—the home in the weald,—which dates its origin from the days of Tofig, a Dane, at whose wedding feast at Clapham, Hardicanute, "all fordronken," fell down with the wine-cup in his hand and died. Tofig being a mighty hunter, built a lodge where Waltham town now stands, "the place having plenty of wild deer." Edward the Confessor had a hunting-seat "built of stone and leaded," called the Bower, at another part of the forest, now known as Havering-atte Bower. He loved the spot much, because it afforded him solitude for his devotions, until they were disturbed by the singing of the nightingales. Camden writes:—"I cannot justify that report how he was hindered and troubled in his praying by the multitude of singing nightingales, earnestly desired of God their absence. Since which time never nightingale was heard to sing in the park." To Waltham Forest down to the days of James I. came all the kings of England who loved to chase the "beasts of venery."

> "The first of them is the hart, the second is the hare;
> One of them is the boar. The wolf, and not any more,"

rhymes the "Book of St. Albans," written, it is said, by Dame Juliana Berners, born within the borders of the Forest. The abbots of Waltham were renowned for their splendid hospitality, of which Henry III., in his hunting expeditions, used to take a mean advantage, by claiming food and lodging at their manor-house for himself and family without remuneration, whenever,—and that was often,—he was hunting in the neighbourhood. At the invitation of Edward IV., the mayor, corporation, and leading citizens, accompanied by their ladies and dames, and all in gallant array, used to hunt with the king in his forest of Waltham, and when the chase was done the company rode back to London, and made merry in the Drapers' Hall. Chingford was the favourite resort of Queen Elizabeth. It included two manors, one which belonged to St. Paul's Cathedral from the time of the Confessor until its enforced surrender to Henry VIII. The church of Chingford (St. Paul's) is now disused. "The present building" (*Gentleman's Magazine*, 1796) "seems not very ancient, not more so than about the time of Henry VII. The whole has been put into a state of very sound repair, so as to appear almost *unalterable, even to time itself.*" Alas! for the vanity of human prophecy, the venerable church has been tumbling down piecemeal for many years; its brasses have been stolen, and only a few of its old monuments remain in the chancel. At last the roof of the nave fell in, and total ruin seemed inevitable, but its picturesqueness saved it, and it was restored in 1873. At the foot of the hill on which it stands is the manor-house, now a farm-house. The other manor, Chingford Earls, at the compilation of Domesday Book, was held by Orgar the Thane. Each manor included meadow and forest land, with pannage for 1,000 hogs. The manor-house of Chingford Earls was the building now known as Queen Elizabeth's Lodge, in which the manorial and forest courts were wont to be held. It is a tall, irregular, half-timbered structure, with gabled ends and high-pitched roofs. "The staircase built out from the house," writes Thorne in his "Environs," "is of large proportions, with massive timbers; the stairs, of solid oak, about 6 ft. wide, are in fours, there being to the twenty-four steps six broad landings." The story goes that when the Virgin Queen visited the lodge, she used to ride upstairs to the great chamber on the second floor. Elizabeth paid at least one visit to Loughton Hall, on the eastern side of the Forest, as also did James I. and Queen Anne when a princess. All that is left to tell of the bygone glory of the hall, which was burned down nearly fifty years ago, are its great hand-wrought iron gates, the avenue that leads from the garden door to the chancel, the few remains of the old church, and the tombs of the lords of the manor in the desolate churchyard. One of the most striking features of the Forest district is High Beech Hill, from which can be seen Waltham Abbey and the windings of the Lea, the woods of Hertford, the uplands of Cambridge, the hills of Kent and Surrey, and the heights of London. While residing at Beech Hill House Tennyson wrote the "Talking Oak":—

> "Once more the gate behind me falls,
> Once more before my face,
> I see the mould'ring abbey wall
> That stands within the chace,
> Beyond the lodge the city lies
> Beneath its drift of smoke."

In 1837 John Clare, the Northampton poet, was placed in the private asylum of Dr. Allen, at Fairmead, High Beech, one of the early reformers of the treatment of the insane. From this place he escaped in 1841, and reached Peterborough, after being four days and three nights on the road, in a penniless condition. In his "Asylum Poems" he writes:—

> "I love the forest and its airy bounds,
> Where friendly Campbell takes his daily rounds."

A favourite walk along with friendly Campbell,—son of Campbell the poet,—was "Buckett's (Buckhurst) Hill, a place of furze and clouds," and boasting of an ancient hostelry,—the Roebuck,—in front of which the stag was uncarted on each returning Easter Monday. Upwards of 160 years ago Tom D'Urfey satirised the Epping Hunt,—

> "Once a year into Essex a-hunting they go,
> To see 'em pass along O! it is a pretty show,
> Through Cheapside and through Fenchurch-street,
> And so to Aldgate Pump," &c.

In the early part of the present century it was not uncommon to see 200 men in pink following the hounds through the Forest, and "there was as great a show as their used to be at Epsom races." The Epping Hunt has long been doomed to oblivion. In 1827 Tom Hood introduced his verses on the Epping Hunt thus:—"The author of the following pages has endeavoured to record a yearly revel, already fast hastening to decay. The Easter chase will soon be numbered with the pastimes of past times. Its dogs will have had their day, and its deer will be fallow. A few more seasons and this City Common Hunt will become uncommon." It has virtually ceased to be, and it was full time it should, when the "roughs" installed themselves as the patrons, and mounted police inspectors in blue took the place of the men in pink. The meeting-place of the sham hunts of late years has been the King's Oak inn, on the east side of High Beech Hill. The name, according to tradition, was derived from an oak planted there by Harold when on his way from Waltham to the fatal field of Hastings. Here, on the 6th day of May, 1882, Queen Victoria planted a sapling oak, and spoke the few but memorable words, "It gives me great satisfaction to dedicate this beautiful forest to the enjoyment of the people for ever." One of the latest acts of the Corporation in connexion with the Forest was the purchase of Wanstead Park for 8,000*l.* Wanstead Manor was the gift of Ælfric to the monks of Westminster, and passing through many hands is now the property of the people. The original manor-house was demolished and rebuilt about the middle of the sixteenth century. Here, for many days, the Earl of Leicester entertained Queen Elizabeth, and Sir Philip Sidney wrote a masque, "The Lady of May," for the occasion, commencing, "Her Most Excellent Majesty walking in Wanstead Garden, as she passed down into the Grove, there came suddenly among the train

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one apparelled like an honest man's wife of the country, where, crying out for justice and desiring all the lords and gentlemen to speak a good word for her, she was brought into the presence of Her Majesty." After this stage direction, of a sort, the masque commences, on the merits of which the queen is asked to decide:—

"Judge you, to whom all beauty's force is lent;
Judge you of love, to whom all love is bent."

In this present year of great book and picture auctions, it may be interesting to know that in the inventory taken of the contents of the house at the earl's death, three portraits of Henry VIII., others of Queen Mary and Queen Elizabeth, forty-three pictures in all, were valued at 11*l.* 13s. 4d., and the entire library, which consisted of an old bible, Foxe's "Acts and Monuments," much worn, seven psalters, and a service-book, at 13s. 8d. In 1665 Pepys "took coach to Wanstead, the house where Sir H. Mildmay died, and now Sir Robert Brookes lives . . . . a fine seat but an old-fashioned house." In two years afterwards the house came into the possession of Sir Josiah Child. In 1683, John Evelyn went to see the new proprietor's "prodigious cost in planting walnut-trees, and making fish-ponds many miles in circuit," &c. The house was taken down and rebuilt in 1715, the architect being Colin Campbell.* Defoe visited it soon after it was finished,—"It is all of Portland stone in the front, which gives it a most magnificent effect at a distance. As the fore-front of the house looks through a long row of trees, so the back-front respects the gardens, from which you fall down an easy descent which lands you upon the terrace, and gives a most beautiful prospect to the river, which is all formed into canals and openings to answer the views from above. . . . I have not room to say half what might be said of this truly noble palace." The unthrift of the last possessor brought the contents of Wanstead House to the auction stand: 41,100*l.* was the result of a thirty-two days' sale in 1822. No purchaser having been found for the house, it was pulled down and sold piecemeal, and the fine old trees were cut down; but the ornamental waters, the grotto, and some of the avenues still remain for the delectation of their many-million proprietors.

From the year 1549 to 1882 is a long wait. On the 23rd of July, in the first-mentioned year, a book was made and sent to the commons (people) of all the realm "because of their rising and pulling down of inclosures, the which was sometime (formerly) commons unto the poor men, and great men took them in and enclosed it to them and made parks in divers places, and as this time the commons (people) have risen and pulled up hedges and palings, this book was sent to them that they should be content gently, and within a short space it should be mended." In four days after this proclamation there was hanged one (of the "risers") that came from Romford, on a gibbet at the well within Aldgate. This Romford man doubtless projected the freedom of Epping Forest. Willingale, his successor after the lapse of 300 years, in fence-breaking, lived to see the Forest free, and "was one of those," in the language of the City Solicitor, "of whom it will be recorded that they had well served their country and the State."

We, in imagination, aided by the earliest of English guide-books, start on a trip to Epping Forest on a bright morning of August, 1720. We make our way through the crowds that are thronging to the markets round the Leaden-Hall, who are arrested in their progress for a few minutes to permit a covered wagon to pass from an archway into the street. "The carrier of Epping, in Essex, do lodge at the Prince his Arms, in Leadenhall-street. He cometh on Thursdays and departeth on Mondays." We secure our seat, and are favoured with the company of a well-informed gentleman of about sixty years of age, who tells us he is setting out on a Tour through the islands of Great Britain. As our wagon slowly rolls through Aldgate, we bid farewell to "the City's love and charity" that are beginning to show how stony they are now that the gilding begins to wear off. Over against the end of Houndsditch my companion, a True-born Englishman, has a good word to say of the plum-pudding of the Pye Tavern and the punch of the Three Nuns. He knew them well, for he lived in the time of the Plague without Aldgate, about midway between Aldgate Church and Whitechapel Bars. Talking about the Plague, we pass through Mile-end-green and enter the village of Bow, where a large manufactory of porcelain is carried on, which, my companion said, though not so fine as some made at Chelsea or Dresden, is much stronger. Crossing Bow Bridge we came to the village of Stratford, which is greatly increased of late years, and my companion pointed out the fine seats, most of them built by citizens of London, who drove to town in their own carriages, that be-spangled the western part of the Forest. On we went between great fields of potatoes until we came to the Green Man at Leytonstone, which had formerly been a lodge on the edge of the Forest, where we halted to bait, and then went on underneath the shadows of the trees through Woodford and Loughton, and late in the evening entered Epping and put up at the Old Lion. The landlord informed us that in his father's time Secretary Pepys had lodged there, and "had some red herrings to breakfast, while his boot-heel was a-mending, by the same token the boy left the hole as big as it was before"; then he and his company "to horse for London through the Forest, where they found the way good, but only in one path, which they kept as if they had rode through a kennel all the way." But here our imaginary trip ends, our daydream is dispelled by the shriek of the locomotive that has sped us and an army of holiday-makers in a few minutes from the heart of the City into that of the greenwood where the sun is shining, and the birds are singing a welcome to the thousands of toilers from under the City's "drift of smoke." Here we cannot do better than quote Mr. Robert Hunter, honorary solicitor to the Commons Preservation Society,—"The favourite parts of Epping Forest are, indeed, crowded on the great holidays to an extent which would certainly prevent us from classing them amongst Nature's solitudes. The vans, the drinking, the donkey-riding, and the swings are mere accidents which will disappear or assume their proper position as education and refinement spread." So let the thousands wander at their own sweet will through the groves where centuries ago the brother of Gurth drove the hogs to the acorns, and Wamba's cousin cracked rude jests, and the twang of the bowstring of some friend of Locksley sent a terror to the breasts of the fat friars of Waltham, and death to the heart of the high-deer, until the shadows of night begin to gather, and the nightingales, despite the malison of the Saxon king, fill the darkening glades with song.

* A native of Scotland. Appointed architect to Prince of Wales 1725, and surveyor of the works of Greenwich Hospital 1726.

THE CARLISLE MEETING OF THE ARCHÆOLOGICAL INSTITUTE.

The members of the Royal Archæological Institute, the commencement of whose proceedings in Carlisle we mentioned last week, appear to have had a very interesting and successful meeting. This is the second time that the Institute has visited Carlisle, its first visit to the border city having been made twenty-three years ago. The success of the present meeting is in no small degree due to the mayor, Mr. R. S. Ferguson, F.S.A., who has been able to render assistance not always to be looked for at the hands of municipal dignitaries. Fine weather has also conduced (as it always does on such occasions) to the success of the meeting.

In the address of welcome which was presented on behalf of the corporation, it was pointed out out that since the former meeting in 1859, considerable changes have taken place in the city, mainly in connexion with the great extension and development of the railway system, but also in the opening out of new streets and the erection of new buildings. In the progress of these works many interesting antiquarian discoveries have been made, by which additional light has been thrown on the history of the past and generally an increased interest has been awakened in all matters connected with antiquarian and archæological research.

The Mayor, after handing the address to the President of the Institute, said,—It was not my intention to have said anything upon this occasion, but I have a little story to tell you which comes so *apropos* that I cannot omit it. For some years it has been known to us who dabble in the muniments of this city that one of our books, and a very valuable book too, known as Order Book B, had been missing out of our records, and any inquiries that we could make gave us no particulars of where this missing book was. That missing book has, within the last hour, been restored to the Corporation. Its being restored is the result of the general rake-up for curiosities that was made for the occasion of the visit of this society. The book was in the hands of a gentleman who has held on more than one occasion the office which I now hold. It had been given to him some two years ago, and I think he had never looked into it until he was considering what he could send to the museum. He then found that he had in his possession this book, which is of the very greatest value to the Corporation in more ways than one; and I am happy to say that by the restoration of that book the Corporation of Carlisle possess a complete series of muniments from the date of the governing charter of Charles I. The series is now unbroken. We had long given up hopes of finding it; and it is a fortunate circumstance, and one we owe to the visit of the Archæological Institute, that we can to-day say that our records are complete.

Mr. Robert Ferguson, M.P., said that as he happened to be mayor of the city on the occasion of the former visit of the Institute, he had great pleasure in joining in the welcome on the present occasion.

Lord Talbot de Malahide, President of the Institute, having briefly replied,

The Rev. Canon Simpson, Vicar of Kirkby Stephen, read an address of welcome from the Cumberland and Westmoreland Archæological Society, in which it was stated that the former visit of the Institute was one of the chief causes of the formation of the local society.

After a few words of welcome from the High Sheriff of the County (Mr. George Routledge),

The President of the meeting (the Right Rev. the Bishop of Carlisle) delivered an interesting opening address, in the course of which, dealing with local antiquities, he said,—It is impossible to pass from village to village in Cumberland without having the condition of things during the days of border warfare brought home very clearly to the imagination. It is not so much the existence of houses of defence like Rose Castle and Naworth, and the fact that almost every house of any magnitude contains its ancient tower, or peel, though now frequently disguised by modern improvements,—not this so much as the fortress churches, which bring back vividly the pugnacious and unsettled condition of the country a few centuries ago. Such churches as those of Great Salkeld, of Dearham, of Newton Arlosh, of Burgh-by-Sands, tell a strange archæological tale. Perhaps in some respects the church of Burgh-by-Sands is the most interesting of those which I have mentioned. I may add that the tale which this curious church tells is rendered more, rather than less, clear by a recent careful restoration. There you have the tower with its impregnable walls, the iron gate between it and the nave, the north aisle with its windows high above the ground, and with a western entrance commanded by an aperture in the impregnable tower, through which a small gun within the tower would pour forth its contents, if necessary, upon an attacking party with great comfort and sense of security to those who manned it. Altogether these fortified churches tell a strange and interesting tale. One of the grounds upon which Henry VIII. was petitioned to spare the Abbey church of Holme Cultram was that it was the only place of defence of the inhabitants against the marauding Scots. But the interest which is connected with monuments of border warfare and records of early English and Mediæval history appears to me almost to vanish by comparison with that which attaches to the relics of the Roman occupation.

Referring to archæology in its bearings on architecture, his lordship said,—Architecture without archæology is manifestly mere confusion. There is plenty of knowledge, of course, which still remains the property of the architectural expert; but the larger number of educated persons, on going into a building like our cathedral, feel themselves at home with the different styles of arches and windows that it contains; they will not grossly confound one date with another, they will see at a glance the rough history of the building, and so far forth they will prove the existence in their minds of archæological knowledge. May I give an amusing instance to show that in this respect improvement has been made in recent years? In the course of your visit to Carlisle, you will

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doubtless see the Fratry. The recent restoration has brought into prominence the pulpit, in which in olden days the reader stood for the edification of the brethren at their meals. It would be difficult now to mistake the purpose of the pulpit; but till lately it was popularly known as "the Confessional," and in order to carry out this view, the artist who has drawn the pulpit for "Billings's Illustrations of Carlisle Cathedral," has represented a woman kneeling on the floor below! . . . . I will conclude my archæological remarks with one or two reflections extracted from a stone. The stone shall be one in the walls of the Church of Burgh-by-Sands, to which I have already incidentally referred. It is a stone which has apparently been in its present place for many centuries, and must have looked much as it does now when King Edward I. was here, and when he died hard by. Plenty of rough work in the way of border warfare that stone has seen. But there are certain marks upon it which open up another chapter in its history; experts will tell you that it is a Roman stone, and a very little experience will enable any ordinary eye to detect this fact. The stone then has been taken, like many others which you may single out here and there, from the old Roman station, the existence of which the name of Burgh attests; and so we see that when our stone looked upon Edward I., or when Edward I. looked upon it, it was already an antiquity of respectable standing; it had then been quarried, say, 1,000 years, and had witnessed many and strange vicissitudes of men and things. But if we trace the stone further still, and consider how it came to be in the quarry from which it was taken by the hands of the Roman soldier or quarryman, we shall find perhaps that it was formed from pre-existent materials belonging to a condition of the world not one thousand, but a thousand thousand years previous: and so we have archæology beyond archæology, and archæology beyond that: our stone tells us not merely of Mediæval history, nor even of Roman residence in Britain, but it bears in its structure evidence of formations and transformations going on under the influence of the powers of nature in the dim distance of the mysterious past. All things are comparative, and the portion of history with which archæologists are concerned is an almost inappreciable moment in the life of this stone. Under the influence of such a contemplation archæologists may well feel that after all they belong to the present more than to the past.

The proceedings of the inaugural meeting concluded, a large number of the members took part in a perambulation of the city. When the party had assembled, the Mayor ascended the steps of the Market Cross (which dates from 1682) and pointed out the townhall and picturesque guildhall, which looks over the green market, formerly used as a bull ring. He explained that the guildhall is an Edwardian building, held of the corporation by cullery tenure, and that each of the ancient guilds have a room in it. These guilds are formed by the merchants, butchers, shoemakers, tanners, skinners, and glovers, smiths, weavers, and tailors. Leaving the market-place, the members wended their way to Carlisle Castle. A halt was first made on the edge of the moat, now dry, which runs across the south front of the building, and the Mayor, who as the leader of the party was received by Colonel Watson and other officers of the garrison, proceeded to explain the situation of the ancient fortress, which occupies a strong position on a bluff or headland of red sandstone, rising to a height of some 60 ft. above the level of the river Eden, and must have been a place of considerable importance in the time of the Romans. He pointed out how the castle had been connected with the walls of the city, and showed where at one time, outside the castle walls, a noble row of ash-trees had been planted, forming an avenue leading to what was once the Castle Orchards, from near the entrance of a part which had acquired some fame as Queen Mary's Tower, but which, he observed, an economical Government went to the trouble of sweeping away, and did not even go to the expense of making a plan. They had also cut down the ash-trees, which were some of the finest in the country.

Mr. G. T. Clark, F.S.A., then offered some observations on the gatehouse called William de Ireby's Tower, forming the main entrance of the castle. Mr. Clark, in some preliminary remarks, said it was no new thing for the Institute to be cordially welcomed by the corporation of a city, but it had never been their luck before to meet a mayor who was so strong an archæologist, and who was as well acquainted by his studies with ancient Carlisle as his official duties made him acquainted with the Carlisle of the present day. Among those studies he had paid particular attention to the castle. He hoped they would make the most of the gleam of sunshine now appearing, which proved it was not a mere fiction of the Border ballads, but really in Nature that,—

"The sun shines fair on Carlisle wall."

Mr. Clark went on to say that the gatehouse was very peculiar and worthy of notice from the fact that the barbican had been added to the side. The gateway had apparently been so constructed that a little doorway at one side could be opened and a sortie made upon any besiegers attempting to mine the walls. The gatehouse was originally approached by a drawbridge across the moat, but at the end of the last century this bridge was removed and replaced by the bridge of stone on which the members of the Institute were now standing. He pointed out over the entrance of the gateway an obliterated coat of arms, possibly that of Richard III. From the general mixing of the styles of architecture, it was probable, he said, that Carlisle Castle had been built at least twice,—by Rufus and by Henry I., but it was difficult to point out which was the work of William or Henry. The stone was also of a very friable nature, and did not afford many indications useful in fixing a date.

The members then passed under the ancient gateway, into what is now the drill-ground, and covered with a layer of gravel, but which the Mayor explained would be a picturesque green in the olden times. Passing into the inner ward of the castle, the members clustered in the open space in front of the massive Norman keep, which Mr. Clark asserted must date from the time of Rufus or Henry I., although it had undergone many changes externally as well as internally. A thorough inspection of the time-worn building was made,—from the deep and dark dungeons at the basement, to which the flaming candles stuck in the niches of the walls gave a grim and fearful aspect, to the gun platform at the top of the tower.

Having inspected the West Walls and other ancient fragments, the visitors dispersed, to reassemble in the evening at a *conversazione* given by the Mayor in the County Hall. In the Lower Hall, Dr. Freeman, as President of the Historical Section, read an interesting paper on "The Place of Carlisle in English History."

On the second day (Wednesday, the 2nd inst.) there was an excursion in the Penrith district, the first place visited being Kirkoswald Church, situate a little over half a mile from Lazonby Station. The church has recently been restored under the supervision of Mr. Cory, of Carlisle. The Mayor, in the absence of Mr. Cory, who was unfortunately very ill, read some notes relating to the fabric.

After an inspection of the church, the excursionists were summoned by sound of bugle to proceed on foot to Kirkoswald Castle adjoining. Though now a heap of ruins, the castle of Kirkoswald was once a place of considerable importance, and, in the time of the Dacres, one of the finest baronial residences in the north. Dr. Taylor, of Penrith, said the castle had been originally founded about the year 1201 by Randolph Engayne, and, after many changes, had finally passed into the possession of the powerful Dacre family, after whose rapid decadence the castle fell from its high estate, and the work of dismemberment and spoliation began. The site presented no natural advantages as a defensive position, but the castle had been surrounded with a remarkably fine moat, which was probably constructed by the Dacres about the year 1500. Mr. Clark subsequently gave some observations on the castle, pointing out that it had been a splendid type of border stronghold, and built not only for the defence of the district but also of the property appertaining to it. At one time the castle possessed a magnificent hall, which, if we relied on history and tradition, could not have been exceeded in baronial magnificence and in the splendour of its internal decorations by any existing in the north in the sixteenth century. The main feature of the ruins now remaining is a tall slender tower, tolerably entire.

The visitors were next driven through the villages of Gamblesby and Little Salkeld, to the famous "Long Meg and her daughters." This is a fine specimen, taking rank as the fourth in England, of the great stone circles. The number of stones that remain, including Long Meg herself, is sixty-seven, of which twenty-seven are upright. Long Meg herself is about 12 ft. high; on her are what is known as "cup and ring markings," which, however, are but faintly delineated. The party having gathered round Long Meg, Mr. J. Evans said he had been asked to give an opinion on this curious collection of stones. So far as he could say it appeared to be one of those very interesting stone circles found in different parts of England and in other countries. Of course, it was certain their presence was dependent, to a certain extent, upon there being large stones in the district. In this way we had the great temple of Stonehenge, built, in the main, of great blocks of stone found on the spot. Certainly, at Stonehenge, a number of stones had been brought from a distance, but the bulk had been found *in situ*. There had been many disputes about the use of these circles, and the subject had given rise to a vast amount of discussion. They had been regarded as burial-places, as temples, and as places for holding moots, but he would not detain them by giving any opinion on the subject. The Mayor said that within a short distance of where the party stood,—some three or four fields off,—a smaller circle of about eleven stones had been found, and in the centre of these there had been discovered a cinerary urn full of burnt bones. On these stones there were markings precisely similar to those on Long Meg, and much more plain. The Mayor added that there was a curious superstition concerning the stones. A legend was current that a farmer in the neighbourhood at one time commenced to blast the stones, but that night the most terrible storm prevailed that had ever been known in Cumberland. The farmers since then had been very jealous of the stones, so that if even any of the party were seen chipping them they had better look out. [Mr. Clark: That warning ought to be printed in the Transactions.] Professor Stevens said that such markings as those on the stones were found not only in Britain, but in many other countries, especially in Scandinavia, and he could only refer them to a very learned work on the subject by the late Sir J. Simpson. He would add that the discoveries which had been made of late in various countries had led to a conclusion, against which so far as he knew, there was no objection, and which appeared to be entirely trustworthy, namely, that these markings were wholly symbols,—religious symbols pointing back to the worship of a God or the Sun. These markings go back to the earliest ages,—they went back to what we commonly call the Stone Age, the oldest age to which we can go, and extended through the Stone Age, through the Bronze Age, and through the Iron Age. Whatever these tokens might signify, they were exceedingly old, and went back to the cradle of the settlement in all the Aryan lands. Dr. Bruce said that these markings frequently existed in burial-places in Northumberland, and were usually found in the presence of a native British camp. He was of opinion that the markings were of the same signification as the fir cone ornaments were with the Etruscans and the Romans, and he could not help thinking their design was the principle of vitality,—they pointed to the belief in a resurrection and a rising again. People travelling in India saw them to-day.

The party once more entered the vehicles, this time to be driven to Brougham Castle, where, upon assembling in the outer ward of the castle, they were addressed by Mr. G. T. Clark, who pointed out that the very curious pile stands on the right bank of the Eamont, just at the point where it is joined by the Lowther, so that the combined streams cover the fortress on the north, as do the two waters and the marshy ground between them on the west front. The castle, he said, derived great interest from the fact that it was close to the large rectangular camp which marks the site of the Roman "Brovacum." One of the most curious parts about the castle, he observed, was the gateway, which was composed of two parts,—one abutting on the north-east, and the other on the north-west angle of the keep, each with its own defences and gates, the buildings on the north communicating with both. Above the gate is the inscription, "This made Roger." Mr. Clark, however, principally directed the attention of the visitors to the keep, which, he said,

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in its present state, was of unusual height, but the uppermost floor had apparently been added at a more recent period than the base. The walls were 11 ft. thick at the base, and at least 10 ft. at the rampart level. In the angles near the top he pointed out several cruciform loops much resembling those at Kenilworth, and a mural oratory. On entering the keep the attention of the visitors was directed to the traces of an arcade with slender piers and trefoiled arches, of an unusual character to be found in a Norman keep. Altogether, he said, the keep was very curious, and would well repay a careful examination.

The visitors, after partaking of luncheon at Eamont Bridge, proceeded to Mayburgh, a circle of stone mounds covered with herbage, with a monolith or stone 12 ft. high in the centre, which Scott thought a monument of Druidical times. It is a short distance from the "Round Table," on the way to Yanwath, and on the right side of the road. On reaching the monolith, Canon Simpson addressed the party, and said that originally there were three stones where the one they were standing beside stood, and those were beside two others at the entrance to the circle, one on each side. The person who occupied the place about 100 years ago came to the conclusion to destroy the stones, and he employed two men upon the work of destruction. One of these men hanged himself, and the other was put in a lunatic asylum. That was what they got for attempting to destroy these ancient monuments. He hoped that by the Ancient Monuments Bill punishment would be meted out in some shape or form to anybody else destroying ancient monuments.

On the third day (Thursday, August 3) the members paid a visit to the Cathedral, where Dr. Freeman delivered an address, some portions of which we give under another heading.

On subsequent days there were excursions to Dalston Hall and Rose Castle, to the Roman Camp at Birdoswald, to Lanercost Priory, to Hexham, to Abbotsford, and to a number of other places.

Mr. John Evans, as President of the Antiquarian Section, delivered a valuable address on the antiquities of the district; and among the papers read in the same section were one on "Cresset Stones," by the Rev. Thomas Lees; one on "Lamp Niches," by Sir Henry Dryden; and one on "Doorway Legends and Inscriptions over Doorways of Old Houses in Cumberland," by Dr. M. W. Taylor. In the Historical Section the Rev. Canon Venables read an interesting paper on "The Dedications of Churches."

In connexion with the Congress an interesting museum of antiquities was opened in the County Hall. It was arranged under the superintendence of the Mayor of Carlisle and the Rev. T. Lees, assisted by Mr. Ready and Mr. W. T. Ready, of the British Museum.

CARLISLE CATHEDRAL.

On Thursday, the 3rd inst., the members of the Royal Archæological Institute visited Carlisle Cathedral, where Dr. E. A. Freeman observed that if a learned man had been suddenly dropped from the clouds into this Cathedral garth, and began to think how much he could find out for himself without any man or book to guide him, he would very readily find, if he lifted up his eyes to the windows of the upper part of the Cathedral tower, that he was in England. He would see Perpendicular windows which could not be found anywhere but in England. He would know at once that he was under the shadow of a great church, and it would not take him long to find out what was the character of the church. It would not take him long to find out it was a regular church. He would see there were the buildings on the right, parallel to the nave, and he would at once feel they were the refectory, and he would be helped to that conclusion if he had been dropped down at Furness and Calder Abbeys before he came to Carlisle. He would see it was not a Cistercian church by the arrangement of the buildings, because in the Cistercian churches the refectory was not parallel to the nave. Then he would doubt, probably, whether it were a Benedictine church. As a matter of fact, it was not Benedictine: it was a church of the Austin canons. He would not be able to say positively to what order it belonged; but he would be able to say it was a great English church of some order of monks and not of the Cistercian order. A further question might be whether it was merely a collegiate or conventual church or the church of a bishop. He did not think there was anything to tell him it was a see,—any episcopal palace. Some local antiquary should be able to tell them whether there was ever an episcopal palace in Carlisle, as there commonly was in episcopal cities, and if not how there never came to be one,—whether it was connected with the long vacancy of the see after the first bishop, or whether after bishops had got feudalised and turned into barons they did not care to have a house in the city. As to the time of the building of this church he would say, "Here we have a Norman minster, not of the smallest size or the greatest, but a moderate-sized Norman church, of which we still have fragments of the nave." He would like to have information to know under what circumstances the nave came to be shortened, but our inquirer could not doubt that there was a much longer nave once than is to be seen now; and if he were told that it was a church of Austin canons he might begin to guess even from the outside a little further. He might, perhaps, guess that the nave had been the parish church, that being the common custom among the Austin canons. That was a point which distinguished this church from other standing cathedral churches in England proper, with a few exceptions. The nave was the property of the parish, and was used as the parish church. The inquirer would see himself that here had been a church in the twelfth century, a comparatively small church, and that a vast and magnificent choir of the thirteenth or fourteenth century had displaced the original eastern limb in a very remarkable way. And he would also see that somebody had in later times gone and destroyed the history of the place by sticking in that grand doorway where no grand doorway was or never ought to be, that the history of the past had been wiped out in order to bring in the pretty things of the present. Here was the refectory, there was the walk in the cloister, and there was the dormitory. There was a little door in the transept originally, but no grand door was there, because there was no grand entrance. Why had the church not been left to tell its own story, to tell every man that the dormitory had come up against the church, and leave the signs that there were of it instead of giving us that new masonry? No doubt the new doorway was a fine thing of its kind, but why not leave them those fragments of history which they came from place to place to make out? It was disappointing when they came to a place to find that some ingenious man had done his best to wipe out the history of it, and that there had been a perfectly wanton sacrifice of the building to make the thing pretty. A doorway was wanted, no doubt, but why not stick it somewhere else and not destroy the historical fragment? From the cathedral garth the party moved into the cathedral, where Mr. Freeman first of all remarked that the nave had not been very early nor, on the other hand, very Late Norman work. If it was the work of Bishop Athelwulf, who was Bishop of Carlisle for a long time, he should be well pleased, as he was a sort of friend of his. Turning to the choir, he pointed out the manner in which it had been widened and otherwise enlarged, and remarked that no doubt when the grand choir was built it was intended some time to pull down the nave and rebuild it, or it might be that the nave being the parish church was not thought about, and the choir was enlarged without regard to the nave at all. Moving into the choir, Mr. Freeman took his stand near the pulpit and pointed out the beauties of that part of the building. The east window, he said, was the grandest window of the kind in England, and he supposed the world. There was a very big window in a church at Perugia, in Italy, that somewhat reminded him of it, but here they had the finest piece of tracery to be seen anywhere. The next to it was that in the Abbey Church at Selby, in Yorkshire, but that had only seven, whereas this had nine bays, and if his memory did not fail him, the bays at Selby were wider. He pointed out the peculiarities in the construction of the roof, no attempt having been made to vault it. He next drew attention to the series of lancet windows in the aisles, remarking that they were rather more perfect than they ought to be. One or two windows had been put in. It was a very curious thing that if there was a piece of history in a building marking its age there came a wise modern architect, a man of taste, with his head full of his own ideas, who felt himself as much above history as the King of Rome did above grammar. This modern architect came and said, "I am the only person who am upon a level with the original architect; I am the only person who knows what he would have done." So the work must be swept away. The wise man of taste must wipe out every thing and bring it back to what he supposed it would have been in his pet century. This wiping out of history, this destruction of the history of an ancient building was called by the strangely sarcastic name of "restoration." "Restoration" commonly meant wiping out of history and building up according to the fancy of some architect to whose tender mercies the building may have been handed over. So it was here. These windows were not the original thirteenth century windows,—they were windows of the nineteenth century, something else had been stuck in and so wiped out history. He expressed some doubt as to the propriety of fencing off the choir from the nave, remarking that he was tossed to and fro on the subject, between the past and the present. In such a case the past was the least harmless, but the case of Carlisle was different, as so little of the nave remained it was necessary to use the choir as the church till somebody should rebuild the nave. If anybody did that he hoped they would build it in nineteenth-century architecture, and not thirteenth.

Mr. Micklethwaite expressed his belief that the Cathedral dated back as far as the time of Cuthbert, and that the parish church was the most ancient part of it. With regard to the alteration of the doorway upon which Mr. Freeman had animadverted, he defended the course that had been taken, remarking that it was quite proper the building should be altered to suit the convenience of the time, but he thought Mr. Freeman had spoken excellently well about the windows.

CONGRESS OF ITALIAN ARCHITECTS AND ENGINEERS.

The fourth annual congress of the Architects and Engineers of Italy will be held in December next at Rome. It has been arranged that the opening of the Palace for Fine Art Exhibitions shall take place during the time of the Congress, whose members are to take an official part in that ceremony as well as in that of the First International Exhibition of Art in the Italian capital. The exact dates of these events are not yet announced. It is open to foreign as well as Italian architects and engineers to attend the Congress, provided they notify their intention to the Committee by the 15th of September. The Committee is also ready to receive suggestions as to the questions to be discussed at the Congress up to the 15th of August. The decision of the Committee on these and other points will be made known along with the publication of the definitive programme of the proceedings on the 30th of October. It is already arranged that the period for which the Congress is to sit shall be seven days. There will be a series of excursions to celebrated spots, in order to enable the visitors to inspect various buildings of ancient and modern date in the city and its suburbs.

MUNICIPAL IMPROVEMENTS IN VIENNA.

In no previous period of history have such extensive municipal improvements been carried out in Vienna as within the twenty years from 1861 to 1880, both inclusive. The total amount of expenditure for that period was 7,891,994*l.*, or nearly eight millions sterling, giving an average annual outlay of nearly 400,000*l.* The objects on which these large sums have been expended are as follows:—The city waterworks system, 2,397,137*l.*; school buildings, 741,640*l.*; the new town-hall, 739,705*l.*; street pavements, 649,366*l.*; purchase of land to widen streets, 621,697*l.*; main drainage system, 441,026*l.*; contribution towards Danube regulation, 385,193*l.*; enlargements of city boundary, 293,109; municipal offices, 273,919*l.*; bridges, 237,242*l*; central cattle market, 179,528*l.*; central cemetery, 163,450*l.*; churches and parsonage-houses, 154,618*l.*; market halls, 137,335*l.*; city baths, 123,493*l.*; park gardens, 87,744*l.*; city gasworks, 72,930*l.* city storehouse, 67,428*l.*; other public buildings, 67,317*l.*; and Danube embankment, 48,082*l.*

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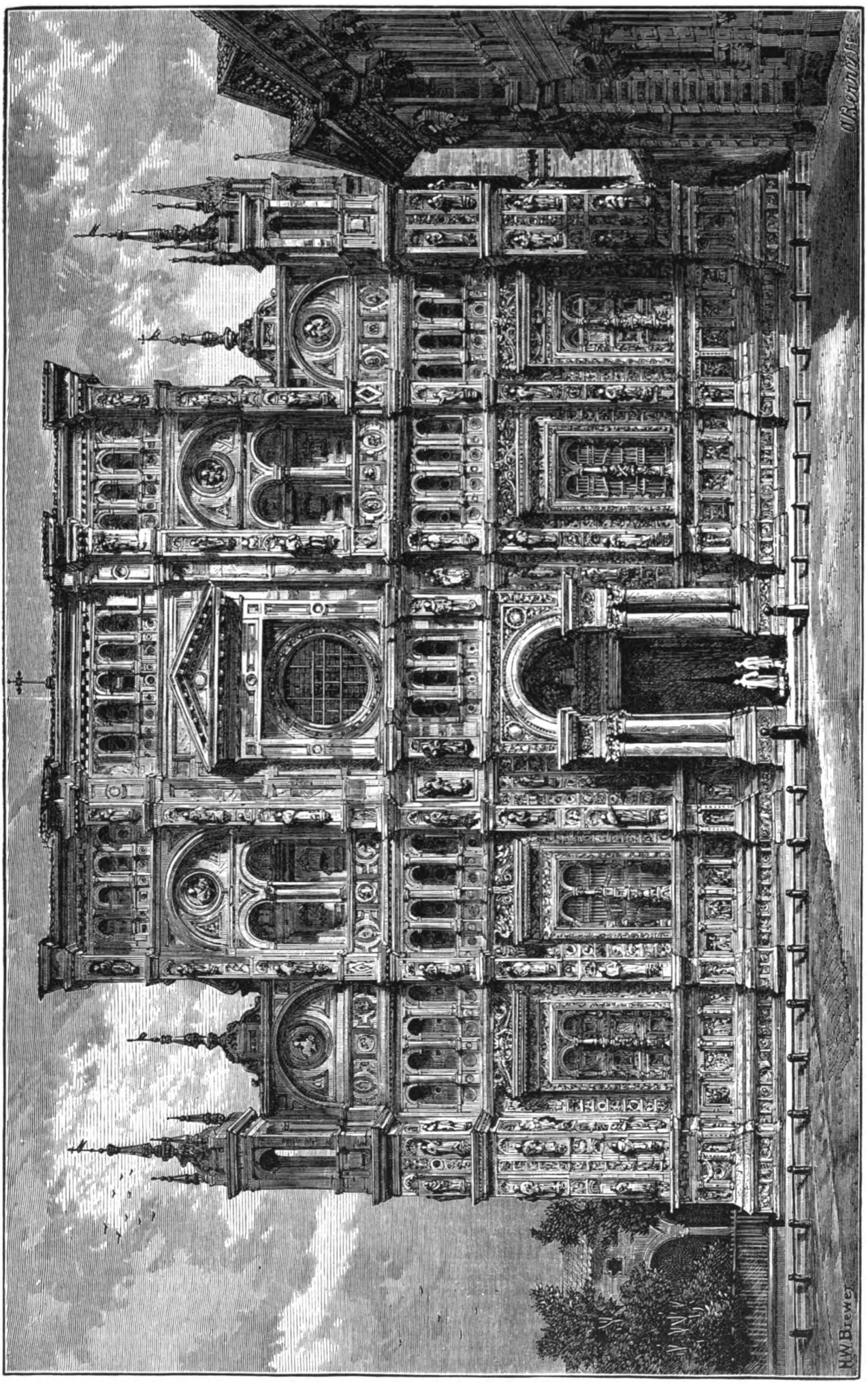

THE CERTOSA AT PAVIA.

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Entrance Lodge. Stockton House. Wilts. for Major Yeatman-Biggs R.A.

B.E. FERREY ARCHT
15 SPRING GARDENS. LONDON

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STAINED GLASS DOOR PANEL.—Designed by Mr. C. C. Haite.

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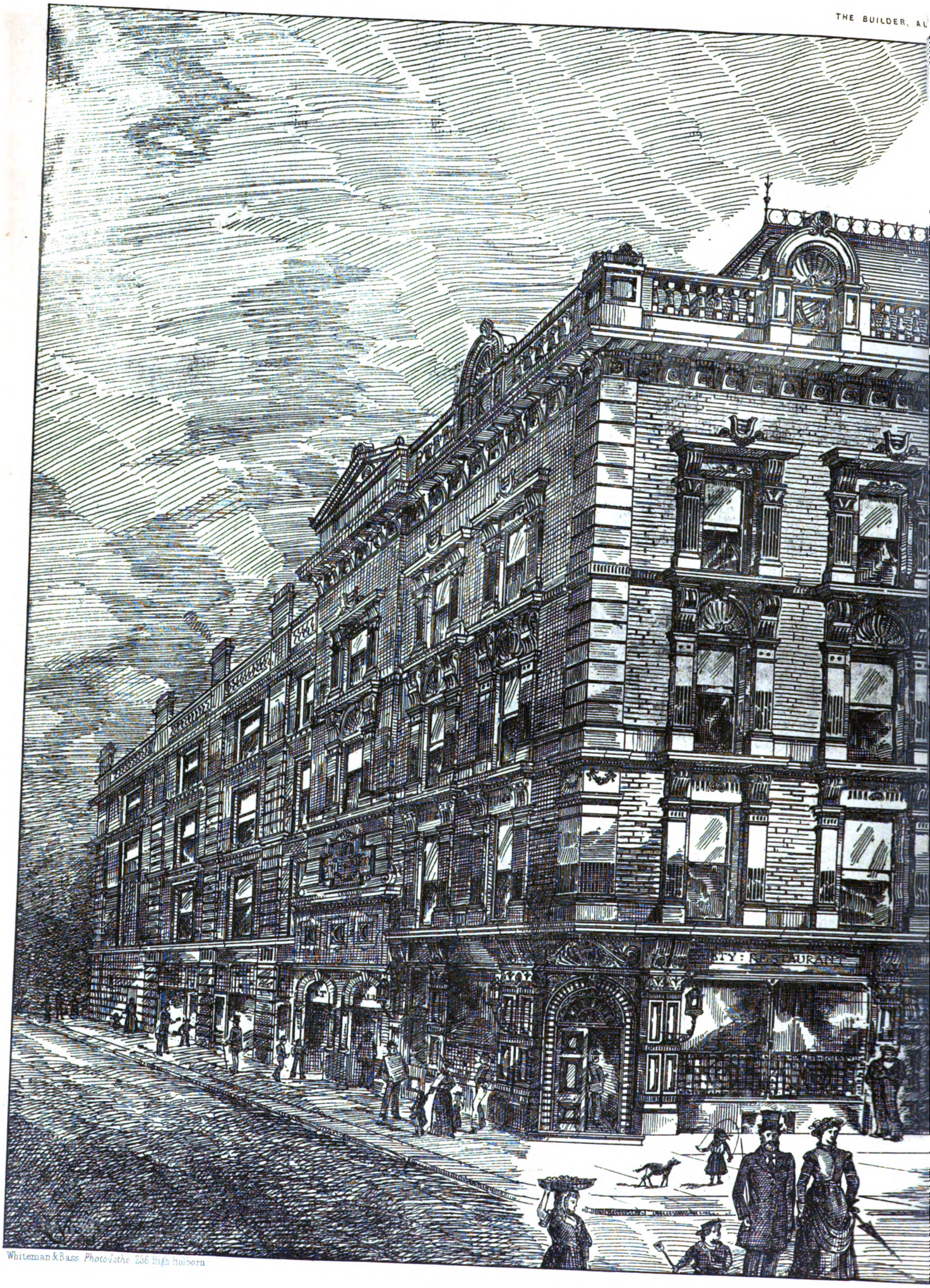

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ENTRANCE LODGE, STOCKTON HOUSE, WILTS.

The Entrance Lodge of which we give a view is now being carried out by Messrs. Soper & Son, of Salisbury, under the direction of the architect, Mr. B. Edmund Ferrey. It has been designed in character with the house, one of the most interesting Elizabethan mansions in Wiltshire, where extensive restorations, alterations, and additions have been progressing during the last five years, for Major Yeatman-Biggs, R.A., under the superintendence of the late Mr. Ferrey and Mr. B. E. Ferrey. The lodge is built of Chilmark stone, and the roofs will be covered with Broseley tiles. All the windows will be fitted with Burt & Potts's wrought-iron casements.

THE CERTOSA AT PAVIA.

The Certosa at Pavia has been described as "the most magnificent monastery in the world." Whether this is an exaggeration or not, there can be no doubt that it is one of the noblest monuments in Italy, and it is with great regret that we have heard reports to the effect that it is not receiving that care and attention which so superb and interesting a building merits. We trust that we have been misinformed, and shall be only too delighted to be in a position to contradict the rumours which have come to us, from several different sources, of "fallen arches," "water pouring through roofs," "accumulations of rubbish and dirt," &c., which seem like the first warnings of a building falling into ruin. To the ordinary run of people a few drops of rain finding their way through the roof of some cloister, or a few heaps of rubbish accumulating in corners of a disused building, may mean little, but to an architect they speak volumes. The general public may regard the giving way of an arch or two in a vast building a matter of little account; but those who understand such things can tell lamentable histories of public monuments where such things are neglected. "A stitch in time saves nine" is more true of buildings than even of garments. If "little defects" of this kind had been attended to, if roofs had been mended when they began to leak, and arches tied up or mended when they showed signs of falling, the enormous sums of money spent upon the restoration of Mediæval buildings, which has been such a marked feature of our time, would have been entirely unnecessary and those munificent donations of hundreds of thousands of pounds towards the restoration of our cathedrals might have furnished our dismal manufacturing towns with noble minsters in place of the meagre 5,000*l.* churches which rear their thin walls and spikey gables in the midst of vast factories and huge warehouses. The Mediæval buildings of Italy are, as a rule, in an excellent state of preservation, and it would indeed be a sad misfortune if they were not to be preserved in such a condition. We hear that a society is being formed in Italy for the purpose of looking after ancient monuments. We trust that the members will place before themselves the absolute necessity of arresting the first symptoms of decay in those vast buildings, many of which, like the Certosa, have ceased to be of practical use at the present time.

The Certosa at Pavia was founded in 1396, and the greater portion of the church was erected immediately afterwards. It is very remarkable because it shows, in work of the same date, the traces of both the Romanesque and Renaissance styles, although the general design is Gothic. The façade is later than the other portions of the church, and was commenced in 1473, and carried out from the designs of Borgognone. Probably, however, the upper portion of the front is of a slightly later date, and it seems as if the design had been simplified, either through funds being insufficient to carry out the work in the extremely elaborate manner in which it was commenced, or in deference to the views of the architect appointed to continue and complete it. Be this as it may, there can be no doubt that, delicate and elaborate as the lower portion of this front is, it is rather the architecture of the painter or sculptor than that of the architect. One hardly likes to criticise such a beautiful work, but from a strictly æsthetic point of view the sculpture of this front seems to be too like painting, and the architecture too like sculpture,—in fact, one might almost suppose that a painter had modelled the sculpture and a sculptor had designed the architecture. The upper portion of the front, though far less beautiful in detail, is more satisfactory from an architectural point of view, and is superior in general composition. The whole of this splendid façade is constructed of marble. There is a kind of tradition that Peter Arler, of Gmünd, was for some time architect to the Certosa, but there is nothing about the building that bears a resemblance to his known works, the church at Kolm, or the choir of the Cathedral at Prague. Another tradition ascribes the merit of the design to Henry Arler, the architect of Holy Cross Church, Gmünd, and reputed architect of Milan Cathedral; but there is nothing to carry out this suggestion.

DESIGN FOR GLASS PANEL.

This design is given as an example of domestic stained glass, suitable for the panel of an entrance or hall door. A door divided into two panels, size as shown, with a change of subject in the pot, would come very effectively.

THE NEW GAIETY THEATRE AT HASTINGS.

The new Gaiety Theatre at Hastings has been opened. In connexion with it are a restaurant, shops, offices, and other buildings, the whole of which have been erected for Mr. George Gaze, the sole proprietor, from the designs of Messrs. Cross & Wells, of Hastings and Chancery-lane, Mr. C. J. Phipps, of London, being consulting architect with regard to the theatre portion of the buildings.

The buildings have a frontage of 71 ft. to Queen's road, and 118 ft. to Albert-road.

The restaurant occupies the corner of the block, and contains a good bar on the ground-floor, grill-room on the first-floor, smoking-room, and residential rooms over, with kitchen and offices at the top of the building.

On the south side of the main entrance in Queen's-road are two shops and the entrance to Queen's-avenue, a new arcade recently built in rear of the theatre. In Albert-road are three shops.

Over the first-named shops and entrance to the arcade are three suites of large offices, with lavatory, &c., on each floor, and attendants' rooms on the upper floor.

The entrances to the stalls, dress-circle, and upper circle of the theatre are from a spacious vestibule in the centre of the building in Queen's-road; those to the pit stalls, pit, amphitheatre, and gallery from Albert-road. The staircases are wide, and fireproof, and all parts of the house communicate by pass-doors to every staircase. In addition to the ordinary staircases to the gallery, there is a second relief staircase, 5 ft. wide, from the gallery and upper circle. It is stated that the house, when full, can be emptied in three minutes. The house will seat comfortably 1,200 people. There are three rows of orchestra stalls (for about 50), a good pit, and four rows of pit stalls; a dress circle to seat 165; an upper circle for about the same number, and a good gallery. There are spacious refreshment-rooms and retiring-rooms to all parts of the house.

The width of the proscenium is 25 ft., and the depth of the stage is 30 ft. Ample accommodation is provided in the way of dressing-rooms, &c., over the side shops.

The materials used are Fareham brick facings and Portland cement dressings, which are found to stand the sea air better than Bath stone, the foliated work being carved in position, and not cast in the ordinary way.

The whole of the building has been executed by Mr. W. J. Rodda, builder, of St. Leonard's-on-Sea, his superintendent of the works being Mr. L. Dillon (formerly clerk of works to the recently-built new baths). The ornamental fibrous plaster work in ceiling, proscenium, box fronts, &c., is by Messrs. G. Jackson & Sons, Rathbone-place, London. The sun-burner and gas-fittings are by Messrs. Vaughan & Brown, of Kirby-street, Hatton-garden. The decorations (extremely well done) are the work of Mr. Edward Bell, of Lisson-grove. The fire appliances are by Merryweather & Sons. The act-drop has been painted by Messrs. Grieve, of Macklin-street, Drury-lane. The stage machinery is by Mr. J. George, and the upholstery by Mr. Whiteley, of Westbourne-grove.

The theatre was successfully opened on the 1st of August, Mr. Henry Turner, of Drury-lane, being manager for the proprietor.

THE UNIVERSITY OF EDINBURGH AND MR. JAMES FERGUSSON.

On the 1st inst. the degree of LL.D. was conferred by the University of Edinburgh on Mr James Fergusson, F.R.S., who is so widely and honourably known by his writings on architecture.

Professor Kirkpatrick, Dean of the Faculty, in presenting Mr. Fergusson to the Chancellor (Lord Glencorse), said,—I have the honour to present to you, my Lord Chancellor, for the degree of Doctor of Laws, Mr. James Fergusson, Doctor of Civil Law, and Fellow of the Royal Society, the distinguished historian of architecture, whom the Senatus Academicus of the University of Edinburgh have deemed eminently worthy of this distinction. Born at Ayr, and partly educated in the High School of Edinburgh, and partly in England, Mr. Fergusson afterwards went to India, and was there engaged in mercantile pursuits. But after a few years he abandoned these for the more congenial study of art and architecture. Not only among architects, civil and military, but among all lovers of art,—and, indeed, among all persons of culture where the English language is spoken,—Mr. Fergusson's name is a household word. In the year 1845, and several previous years, he travelled very extensively in India and in many other countries for the purpose of studying various styles of architecture. The results of those studies and unwearied researches have been very numerous and very valuable. (Having enumerated Mr. Fergusson's works, Professor Kirkpatrick continued:—) Mr. Fergusson is one of the foremost authorities of the age on the very interesting and important subject of military architecture or military engineering. So far back as 1849, Mr. Fergusson published a most valuable essay upon the then entirely new system, upon the subject of fortifications or defences by means of earthworks, a system which was afterwards adopted by the Russians at Sebastopol, by the Americans during their civil war, and subsequently, I think I may say, by all the great military nations of the world. In connexion with his great distinction in this province, Mr. Fergusson has, since 1859, acted as one of the Commissioners appointed by her Majesty the Queen to superintend our national coast defences. Lastly, but perhaps not leastly, must be mentioned Mr. Fergusson's distinguished labours as a natural philosopher. Within the last few years, Mr. Fergusson has published a most valuable work upon the descent and oscillations of rivers, of which I need only say that it is a standard work upon this subject. Among many other distinctions, I must mention the gold medal with which Mr. Fergusson was presented in 1871 at a great meeting of the Institute of British Architects, presented to him with the approval of her Majesty the Queen, as being the foremost living British authority upon the subject of architecture. On these grounds, I ask your lordship to confer upon Mr. Fergusson the degree of Doctor of Laws, of which he is pre-eminently worthy.

ARCHITECTURE ABROAD AND IN THE UNITED STATES.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

Mr. Arthur J. Gale, architect, of Surrey-street, Strand, the first recipient of the Godwin Bursary, and who selected America as the scene of his inquiries, has reported to the officers of the Institute his return, after an absence of three months. Mr. Gale speaks warmly of the courtesy he experienced at the hands of several American architects.

Memorial to an Officer of the 19th Regiment.—A painted window, of a somewhat curious character, has just been erected in the church of Preston, near Brighton, representing the colours of the 19th regiment, with the engagements, military trophies, and the regimental badge, surmounted by the Crown. The window, which is supplied by Mr. Taylor, of Berners-street, is placed in memory of Captain George V. Macdonald by his brother officers.

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WORKMEN'S DWELLINGS IN GERMANY.

The subject of these remarks is not one upon which it is to be taken for granted that England has nothing to learn from other nations. The problem of cheap and efficient labour has been solved by Germany in a manner which has enabled the manufacturers of that country to secure and retain a hold upon even our own markets for many articles in which economy of production is of primary importance. Hence it may not be amiss to examine what is now doing amongst German philanthropists in the direction indicated.

The physical gain derived from commodious dwellings finds its parallel in many natural phenomena, and requires no detailed proof. Mental advantages of a not less important character are connected with the practical application of this principle. As Dr. Tomei remarks (in a paper prepared for a recent Industrial Congress in Germany) a clean and comfortable dwelling encourages its occupants to ornament it as far as they can, and is a magnet which attracts the bread-winner from dissipation. If his dwelling is a place where he is comfortable, he will soon give up the tavern, and will economise his personal expenses so as to furnish his rooms with such adornment as become his station.

This important subject has recently attracted special attention in Germany, in connexion with the competition instituted by the "Concordia" Society for the best design for a workman's house. As this question is most readily solved from a strictly practical point of view, the facts cited by Dr. Tomei are a valuable guide, and though a certain allowance must be made for the divergence of national habits, still much may be learned from the results he brings forward.

The Portland cement factory at Lebbin has in connexion with it a colony, as it is called, which has grown from a small beginning, which consisted in the erection of several workmen's houses. Those who had been longest working at the factory had certain preferential advantages, but, in all cases, the possession of such saved capital as was necessary was insisted upon before permission to build was granted. The dwellings built by the factory proprietors are mostly detached buildings, containing from five to seven separate sets of apartments. These buildings have grounds round them neatly laid out, which, in conjunction with the curtained windows of the houses, produce on the whole a neat and pleasing effect. The materials used are bricks, both burnt and air-dried.

The houses with five dwellings are thus divided:

Lower Floor.—Two dwellings, each containing two rooms, 14 ft. 8 in. by 14 ft. 8 in., and 12 ft. 4 in. by 14 ft. 8 in.; one room, 6 ft. 5 in. by 14 ft. 8 in.; and a kitchen, 10 ft. by 12 ft.

Upper Floor.—Two large dwellings, and one of smaller size. Each of these dwellings consists of a kitchen, a living room, and a bedroom.

In the houses containing seven dwellings, the lower floor contains four dwellings, and the upper floor three, as previously described. The dwellings on the lower floors have in most cases separate entrances, while the upper floors are reached by a common staircase. There is a small stable attached to each house, and the separate occupants of the apartments have each space in it for pigs as well as storage for wood, &c. The arrangement of houses thus described is capable of being applied alike to private and public requirements. Thus, in the lower stories of various houses are the post-office, the infants' school, the infirmary, &c. In addition to these separate houses there are some blocks of seven houses, each of which is capable of accommodating four families. A building runs parallel to these houses devoted to purposes similar to those for which the stables in the detached houses are intended. There is an orphanage attached to the colony, and a general co-operative store supplies the principal necessaries of life to the inhabitants. The workpeople are allotted dwellings in these houses for a monthly rent equal to 4s. or 4s. 6d. A field for planting potatoes is also at their disposal, and laundries with mangles form a part of the general plan.

The personal comforts of the unmarried workmen and of those whose families live at a distance are provided for in the colony. A large lodging-house has been established, with from four to six beds in each room, and the men are charged only what is sufficient to cover the washing of sheets, &c. The house steward provides coffee and milk at about ½d. a quart every morning. Dinner, of a good nourishing character, is served for about 1d. Of course, the factory is obliged to supplement the receipts in order to prevent loss, but this low scale of charges is instituted in order that the workmen who live at a distance may be able to devote the greater part of their earnings to the support of their families, and not be under extra expense from having to reside at a distance from their work.

The usual benefit societies exist, and are supported, to a certain extent, by the profits of the co-operative stores. The amusement of the workpeople is duly provided for by means of a bowling-green and by vocal and orchestral societies.

Where economy is a primary necessity, it is impossible (according to Dr. Tomei's arguments) to give any serious consideration to the plan of having separate houses for each family. Where, however, there is a possibility of workmen being able to build their own dwellings, he admits that the question of having joint habitations is open to discussion. He remarks, with justice, that it is unadvisable to give more rooms for each separate household than are necessary for health, as the trouble of keeping too large a set of rooms in order often leads to untidiness and neglect on the part of the occupants.

The guiding principles of Dr. Tomei's views are evidently in harmony with the almost patriarchal system which is frequently to be met with in Germany. Kindness being a more powerful inducement than severity to continued and intelligent exertion on the part of the employed, he argues that the trouble and expense to which employers of labour go to secure the happiness of their workpeople are not lost, but are repaid by the quantity and character of the work produced.

PROPOSED PUBLIC BUILDING WORKS IN DUBLIN FOR UNEMPLOYED LABOUR.

Last week a deputation from the Labourers' Association here waited upon the Lord Mayor and Municipal Council.

Mr. Murphy, one of their number, said that there was a very large number of unemployed persons in the city, 9,000 people receiving relief through the unions. The only work here now for labouring men was at paving and sewering, but there was nothing like sufficient work to meet the requirements of the unemployed. He attributed the cause to the agitation in the country, which had led to such widespread distress. The merchants who had hitherto employed labour were now, from that cause, unable to do so. For the last couple of years the merchants of the city had received no money: they were now on the verge of bankruptcy, the exceptions being those who were living on the capital they had accumulated in more prosperous years. It was said that the tenant farmers had saved 20,000,000*l.* in consequence of the agitation, and he asked, Where had it all gone to? The labourers had received no portion of it. It was the circulation of money that was wanted, and no country could be prosperous while its labourers remained without employment. Wages were lower than ever, and in their hour of need the labourers now applied to the Corporation for aid. If they wished to relieve them they could build labourers' houses for the use of those who could not pay as much as the artisans were obliged to pay. A clause had been proposed for insertion in the Land Act, having for its object the emigration of the surplus population of the country, and that was opposed by the advanced section of the Irish members, who urged that, because the country had once contained 9,000,000 of people, it should now support an equally large population. He thought such opposition was unwise, and he was in favour of the emigration of those who could find no employment, and who could not be otherwise provided for. The position they were in now amounted to this: they were near eating each other in the streets of Dublin.

The Lord Mayor said the Corporation would attend to the practical propositions of the deputation. It should not be forgotten that since he came into the Corporation the latter had spent in public works, in which the labourers, of course, had a share, 200,000*l.* They now proposed to spend over 50,000*l.* in improvements. The Corporation paid 600*l.* a week in labourers' wages, and they contemplated the formation of new streets. There would be a new street in connexion with the swivel bridge, and another at Cork-hill. The exhibition project, too, contemplated and involved an expenditure of 10,000*l.* or 12,000*l.*, and on that they were spending 400*l.* or 500*l.* a week. The Council would take into consideration the wise suggestion for the erection of dwellings for the labouring classes who were not able to pay as high a rent as the artisans. He would draw particular attention to the fact that 100,000*l.* had been voted by Parliament for the construction of a new museum in Kildare-street. The plans were in, all the preliminaries were perfected, and there was no excuse for the Government not taking immediate action in this matter and pushing forward these works. The Government could also give employment by building the new sea-wall along the Kingstown line, giving the citizens of Dublin a sea drive, and an approach of which they had been deprived by the railway company. There was thus work for the expenditure of thousands of pounds in giving employment. As for the practical suggestion of the deputation, the Council would take it into consideration.

The deputation having retired,

Mr. M'Evoy moved, Mr. Vereker seconded, and it was resolved,—"That the Artisans' Dwellings Committee be informed that the Council have received a deputation upon the subject (amongst other matters) of dwellings for the labouring classes, and that the Council would be prepared to receive favourably such suggestions as the Committee may make on the subject."

NEW ASSOCIATION AT DÜSSELDORF.

The financial result of the Exhibition at Düsseldorf in 1880 was satisfactory, inasmuch as a surplus of 10,000*l.* was left. This sum has been devoted to the foundation of an association intended to rival the societies which have done so much in South Germany for the advancement of industrial art. The new organisation will devote its attention to the collection of objects illustrative of art as applied to practical uses, and to the establishment of classes in connexion with subjects of a kindred nature. It is also contemplated to have an information office which will answer any questions as to technical subjects which the members of the society may wish to ask. A complete library of technical literature will be established, and finally a journal will be started, which will be the official organ of the society, and will, it is anticipated, be widely circulated amongst manufacturers and others interested in the various objects of the association.

EPPING FOREST TRAMWAYS.

A meeting of the shareholders took place on Tuesday, August 1st, at the office of the company, the chairman, Mr. Mark Shephard, presiding. There was a large attendance. Mr. C. B. King, one of the company's engineers, stated that, although the rails had only been delivered a few weeks, about 500 yards of line were already completed, and the first section will be opened for traffic in about three weeks' time.

The company intend to apply in the next session of Parliament for power to use steam, and for this purpose the line is very substantially laid.

Mr. Hammock, a director, mentioned that at Batley, in Yorkshire, where both steam and horse power have been in use, it had been proved that a saving of 2¾d. per mile had been made by the adoption of the former. The engines were constructed by Merryweather & Sons, who have had experience in this branch of engineering.

Messrs. B. Cooke & Co., of Battersea, are the contractors for the works, and Messrs. Merryweather have the contract for the cars.

Mr. Thomas Armstrong and Mr. H. Bowler (the director and assistant-director for Art of the Science and Art Department) have been instructed to visit the Art Schools of Germany and the Industrial Exhibition at Nuremberg, and to prepare a report on German art-teaching.

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THE LONDON AND SOUTH-WESTERN BANKING COMPANY'S NEW BUILDINGS AT PECKHAM.

The premises occupied by the London and South-Western Banking Company at Peckham, being on the line of improvements now going forward at Camberwell and Peckham, their removal is necessary for the widening of High-street. The company are at present erecting spacious new bank buildings on a site immediately opposite to Rye-lane, Peckham, and these when completed will be of a very ornamental character.

The buildings will have a frontage to High-street of 50 ft. length, and 40 ft. in height to the cornice. The buildings will have a deep basement, with three stories above the ground-floor, the upper story consisting of arched dormers in the roof. The east end of the frontage, which is carried to a height of about 60 ft., terminates with an ornamental tower. The ground-floor portion of the frontage consists of red Aberdeen polished granite columns and piers, resting on grey granite bases, and supporting a projecting cornice in Portland stone. Between the first and second floor windows there are double columns and pilasters, in Mansfield stone, with Portland stone bases and capitals, surmounted by a dentilled cornice, also in Portland stone. The windows of the several floors have carved architraves and panels, surmounted by ornamental pediments. The west portion of the ground-floor will contain two shops, the entrance to the banking-house and other apartments in connexion with the business of the bank being at the east end of the frontage under the tower. The building is carried to a depth of 100 ft. from the High-street frontage, the business of the bank being intended to be conducted at the rear of the premises. The arched entrance to the bank, in Portland stone, is flanked on each side with Aberdeen polished granite columns. This entrance leads into a corridor, 11 ft. in width, from which the banking-house is reached. The corridor, as well as the banking-house, will be richly decorated and finished. The floors of both will be paved in Rust's mosaics, and along each side of the corridor there will be a range of fluted scagliola columns. The banking-house will be 46 ft. by 32 ft., and carried round the apartment will be twelve scagliola columns, uniform with those along the corridor. The walls will be divided into panels, with an enriched coved cornice; and in the centre an artistically-executed hexagonal lantern-light. The height of this apartment to the ceiling will be 18 ft., and to the apex of the lantern-light 25 ft. The other apartments on the ground-floor will consist of the manager's private room and waiting-rooms. The upper floors will contain the manager's residence, together with the servants' apartments, kitchen, &c.

A chief feature in the basement will be the strong-room, a fireproof apartment, built on a bed of concrete 3 ft. 6 in. in depth, the walls being 1 ft. 9 in. in thickness, of Stourbridge fire-brick, built in Portland cement and hoop-iron bond. The safes, doors, and fittings of the strong-room will be furnished by Milner's Safe Manufacturing Company, of London and Liverpool. The basement also will contain the heating apparatus for the bank.

The architects are Messrs. James & J. S. Edmeston, of Old Broad-street, the contractor being Mr. Shepherd, of Bermondsey. The estimated cost of the building is 12,000*l*.

THE FALL OF A CHURCH TOWER.

The terrible accident at the village of Langen Lipsdorf, near Berlin, in which a church tower that was nearly completed fell in a heap, bringing down all the scaffolding, and killing some and severely injuring others of the thirty workmen engaged upon it, has been the subject of legal and professional inquiries, with a view to ascertain the cause of the disaster. The tower was to be of a total height of 112 ft., and at the time of the accident about 70 ft. had been finished. The dimensions were small, the sides being respectively 14 ft. 9 in. by 14 ft. The two lowest stories of the tower were together 24 ft. 6 in. high, and their walls were 3 ft. 1½ in. thick in front, 2 ft. 10 in. at the sides, and nearly 2 ft. 4 in. at the back. The outer facing consisted of erratic granite shaped into blocks of 6½ in. and 8 in. in height and breadth. The internal facing was of brick. The space between the facings was filled with fragments of brick and stone. The mortar employed was made with Saxon brown or meagre lime. The third and fourth stories of the tower were together 23 ft. high, and the walls, 21 in. in thickness, were built in the same way as those below. The fifth story, 16 ft. 6 in. high, had its walls constructed entirely of brick. The work had already been finished thus far. The tower was now to be capped with a simple spire of wood and slate, surmounted by a cross. Preparations were already going on for the commencement of the woodwork of the spire when the calamity occurred. The entire structure suddenly collapsed. The front wall of the tower fell completely as far down as the springing of the arch over the entrance-door, about 8 ft. from the ground. Of the back wall adjacent to the body of the church about 26 ft. was left standing. The side walls both fell. The parts left standing rose obliquely from the level of the springing of the front arch in a steep and stair-like fashion, to where they joined the back wall. On the top of the heap of ruins lay the diagonal beams of the scaffolding and the brickwork of the fifth story of the tower. Below lay the scaffold planks and granite stones and fragments of the lower stories. This position leads to the inference that it was the walls of the lower stories of the tower that first gave way. This inference is confirmed by the observations of the workmen who happened to witness the collapse. According to the report of the authorities, one cause of the accident was the use of very inferior mortar. The mortar employed was composed of five parts of sand to one part of lime. This material had practically not set or bound the stone and brickwork together. Another chief contributory cause was the fact that the bond of the masonry work was in a very high degree imperfect. Out of 640 granite blocks used in the facing, there were only thirty bonders having a length of about 15 in. There was, therefore, only one bonder to every twenty stones. The interior brick-facing too, was, for the most part, only half a brick in thickness, and the bricks were laid so that there was only one bonder to two, or often three, stretchers. The filling in between the facings was also very badly done, there being many small fragments of brick and stone, with insufficient mortar, and that of the ridiculously inferior quality above described. Altogether it is obvious that this was a very bad case of scamping, which is likely to cost the contractors very dearly.

ESSEX ARCHÆOLOGICAL SOCIETY.

The Essex Archæological Society, which was inaugurated at Colchester in December, 1852, commenced the celebration of its thirtieth anniversary at Colchester on the 1st inst. The members of the St. Paul's Ecclesiological Society, and other visitors, were invited to share in the business of the meeting.

The members were conducted over the castle by Mr. F. M. Nichols, of Lawford Hall, who pointed out the principal features connected with it. At noon the annual meeting of the society was held in the library of the Castle. Mr. G. Alan Lowndes, of Hatfield Broad Oak, the President, occupied the chair, and Mr. H. W. King, hon. secretary, read the report of the Council for the past year.

On the motion of the Rev. G. C. Berkely, seconded by the Rev. H. Hayes, the report and balance-sheet (which were of a satisfactory nature) were adopted.

Mr. C. Forster Hayward moved that the thanks of the meeting be given to the president, vice-presidents, council, and officers for their services during the past year, and that they be re-elected, with the addition of Capt. Budworth in the place of Dr. Bree. Mr. Hayward said the services of their president were too well known to need comment. Mr. Lowndes was always ready to meet them and to assist them in every way, and the same might be said of the other gentlemen included in the resolution.

Mr. Benton seconded the vote of thanks, and it was carried unanimously.

The President said he was extremely obliged to them for the honour they had conferred upon him by his re-election. It was a great pride and pleasure to him to occupy such a position, although he felt that he filled it very unworthily. The principal work that had fallen upon him had been in editing the history of Hatfield Broad Oak. This had been a labour of great pleasure, and he was glad to find that those papers written by his father, and edited by himself, had been so much appreciated by the society.

Mr. King also briefly acknowledged the compliment paid him. He said he served as hon. sec. with very great pleasure and cheerfulness, and he hoped he should be able to do so as long as he was spared. He believed that Mr. Chancellor and himself were the only members of the Council who were at the inaugural meeting of the society, so that it would be understood he was rather an old servant.

After the transaction of other business, the meeting proceeded to make a perambulation of the town, and inspected the following places of interest:—St. Helen's Chapel, St. Martin's Church, Holy Trinity Church, the Balkerne Gate, Guard House and Roman Walls, Schere Gate, St. John's Abbey Gate, St. Giles's Church, St. Leonard's Church, and St. Botolph's Priory. By the invitation of Mr. James Round, treasurer of the society, a *conversazione* was held in the library at the Castle from eight till eleven p.m., when several papers were read and discussed.

On Wednesday there was an excursion, starting at ten. The places visited included Chappel, Colne Church and Priory, the churches of Great and Little Tey, Marks Tey, Copford, and Stanway.

SIR FRANCIS DRAKE IN LONDON.

"In the night of the 22nd of January, 1569, William Hawkins, junior, esq., Governor of Plymouth, writing to the Privy Council, says,—"It may please your honours to be advertised that there is, this present night, arrived into the port of Plymouth one of the small barks, the *Judith*, of my brother Sir John Hawkins's fleet, from the Indias." The captain of this privateer of 50 tons had brought back nothing but his ship after months of exploitering in the Spanish Main. His name, not mentioned in the above report, was Francis Drake, who ten years afterwards entered the harbour of Plymouth on board his good ship *Hind*, which had circumnavigated the globe, and stepped ashore not far from the spot where a monument to his memory is about to be erected. This same *Hind*,—

> "The great ship which around the world has run,
> And match'd in race the chariot of the sun,"—

was by Queen Elizabeth's orders drawn up in a creek near Deptford. The queen dined on board the ship, and knighted the captain.

Within a century ago any one wandering among the network of lanes and alleys "without Temple Bar," whose site is now occupied by the Courts of Justice, might have noticed a tavern of evil repute, the wreck of the Ship Inn, standing in a gloomy, ruinous yard, to which it had given its name, 300 years ago. Robert Chambers, in his "Book of Days," mentions that "Ship-yard denotes the sign of the 'Ship,' a house established in honour of Sir Francis Drake, and having for its sign the bark in which he circumnavigated the world." This statement is incorrect. Drake was not knighted until April, 1581, and the inn was known as the "Ship" ten years previously, for in 1571 "an inn near Temple Bar, called the 'Ship,' was granted to Sir Christopher Hatton." An explanation of Chambers's error based upon rumour is to be found in Walpole's "Dictionary of Engravers." In his mention of Faithorne, the distinguished engraver of the time of Charles I., he says:—"Faithorne set up in a new shop at the sign of the Ship, next to the Drake, opposite to the Palsgrave's Head Tavern without Temple Bar." Here the "Drake" is mentioned as an inn apart from the "Ship." Forty years ago these three houses of entertainment had vanished, leaving in their places a filthy public-house and a den in which beer was retailed.

Only one of Drake's dwelling-places in London is recorded. Stow, in his survey of "Downegate [Dowgate] Ward," says, "On the east side of this Downegate-street is the great old house called the Erber, near to the church of St. Mary Bothaw. Geffrey Scroope held it by the gift of Edward III." After passing into the hands of many noble proprietors, "it was lately new builded by Sir Thomas Pullison, Mayor, and was afterwards inhabited by Sir Francis Drake, that famous mariner." No doubt the neighbourhood was much frequented by sea-faring men, for Stow, in explaining the name of the church burnt down in the Great Fire and not rebuilt, writes, "St. Mary Bothaw,

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or Boatehaw, by the Erber,* hath the addition of Boathaw, or Boat haw, of near adjoining to an haw or yard, wherein of old time boats were made and landed from Downgate to be mended." The fire devoured the famous mariner's house shortly after the *Hind*, which had been fitted up as a banquet-hall, had been broken up. The name of Nelson is attached to several London streets and squares, and to more than a score of taverns and public-houses. There is one Drake-street, but not named after him, "for whose fame the ocean sea was not sufficient room."

THE BERLIN ROYAL THEATRE AND OPERA HOUSE.

The architectural changes consequent on the suggestions of the Government officials have been designed with a view to facilitate the immediate egress of the audiences in case of fire. They are now being carried out by Herr Hense, under the superintendence of Herr Persius. The complicated requirements of the modern stage are being duly kept in view. As in the other instances to which we have lately referred, the iron curtain forms a prominent feature in the proposed measures of safety. In both the houses named it is made of corrugated metal. Instructions have been given for a daily trial of the iron curtain to insure its being in working order. It has been found possible to let down the iron curtain of the Royal Theatre in sixteen or seventeen seconds, and to wind it up in two minutes.

In both houses additional entrances for the public have been constructed, and some seats have been taken away from near the entrances of the pit in order to make the egress more free. The stage has further been separated from the auditorium by massive walls and iron doors. To complete the isolation, such drains as may require to be laid down will be of iron, and will be provided with appliances to enable them to be closed in the event of fire, it being thus contemplated to prevent the passage of sparks which might cause a conflagration to spread.

The iron curtains have the following dimensions:—Opera House, 52 ft. 6 in. in width and 41 ft. in height; Royal Theatre, 39 ft. 6 in. in width and 39 ft. 6 in. in height.

The works at the Royal Theatre are in such a forward state that the theatre is expected to re-open for the season on August 25th.

PROPOSED SUBSTITUTION OF WOOD FOR STONE PAVEMENT IN COUNTY DUBLIN.

At last week's meeting of the Drumcondra Commissioners at Holly Park House, Mr. R. M'Mullen presiding, Mr. Leonard, C.E., read a report on the expediency of adopting some system of road covering other than macadamising. He said that he had given special consideration to the question of wood pavement, using Irish beech, of which an abundant supply could be had in the county Dublin, and in dealing with it he had considered four matters, namely, convenience, safety, durability, and cost. With regard to the first, all things being equal, wood pavement possessed advantages over any other kind, and was far easier and safer for horses than granite or asphalte. In places where wood pavement had failed, he believed the process of laying had been the cause of failure, or through the action of percolating water being overlooked. About 6,912 yards would have to be laid down, about 6 yards in width, giving an area of 41,472 square yards to be paved. The cost would be only about 10s. a yard, so that the total cost would be 20,736*l.* He recently saw in Birmingham wood pavements which had been laid down over fourteen years, and they were now just as good as new.

Mr. M'Mahon said the report was an admirable one. The roads were at present in a most unsatisfactory state, notwithstanding the cost of repair was extremely large, being between 1,300*l.* and 1,400*l.* a year for the carriageway alone. If they borrowed 20,000*l.* for this work they could pay it off in thirty years, and at the end of that time they would have magnificent roads, which would cost scarcely anything to keep in repair.*

The subject was referred to the Roads Committee.

* Why the house was so called Stow does not explain, nor does Thornbury in "Old and New London." The word "erber" is a form of "arber," an arbour or garden; "He led him to a fair 'erber,' the gates were of clean crystal." That King Edward's riverside pleasure-house should be named "The Arbour" is no more inappropriate than styling the royal hunting-lodge in Waltham Forest "The Bower."

* If this be correct they must have made some wonderful discoveries in county Dublin.

BUILDING PATENT RECORD.†

APPLICATIONS FOR LETTERS PATENT.

3,613. A. C. Henderson, London. Stoves for heating by hot air and water. (Com. by Besson & Co., Paris.) July 31, 1882.

3,614. T. Hyatt, London. Illuminating gratings. July 31, 1882.

3,638. A. Stevenson, Chester. Apparatus for filtering, &c., currents of air. August 1, 1882.

3,688. W. Thompson, Crompton Fold. Door knobs. August 2, 1882.

3,696. W. Ney, London. Prevention of noise in window frames. August 3, 1882.

3,701. C. E. Hanewald, London. Apparatus for preventing down draught in chimneys, &c. (Com. by F. Haszelmann, Munich). August 3, 1882.

3,702. L. Roth, Wetzlar, Germany. Manufacture of cement. August 3, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named:—

August 1, 1882.

1,498. W. R. Lake, London. Metallic shingles for roofing purposes. (Com. by C. Comstock, New Canaan, U.S.A.) March 28, 1882.

1,575. W. R. Lake, London. Manufacture of metallic roofing shingles. (Com. by R. Seaman, New York, U.S.A.) March 31, 1882.

1,584. G. L. Shorland, Manchester. Fireplaces. April 1, 1882.

1,740. A. Browne, London. A stove. (Com. by L. Breglia, Dresden.) April 12, 1882.

3,198. T. N. Sully, Wellington. Walls of houses, &c. July 6, 1882.

August 4, 1882.

1,785. T. Rowan, London. Apparatus for ventilating. April 14, 1882.

ABRIDGMENTS OF SPECIFICATIONS.

Published during the Week ending August 5, 1882.

5,633. R. G. Garvie, Aberdeen. Machines for spreading sand, salt, or other material on streets, roadways, &c.

To insure uniform spreading of the material, a hopper is arranged at the back of the cart, through which the sand, &c., is forced by a shaft with stirring blades. It is then discharged through the whole length of a screen by endless chains, which draw the sand from the mouth of the hopper and distribute it. Dec. 23, 1881. Price 6d.

5,655. B. J. B. Mills, London. Apparatus for heating water.

This is a portable apparatus, and consists of small tubes coiled round a central gas-burner and enclosed in a suitable metal case. The water passes through the tubes to be heated. (Com. by L. J. Robin, Paris.) (*Pro. Pro.*) Dec. 24, 1881. Price 4d.

5663. W. R. Lake, London. Apparatus for extinguishing fires in theatres, &c.

The cock on the main waterpipe is kept closed by a weight connected thereto by a cord, when this is burnt the water is automatically turned on. (Com. by H. S. Maxim, Brooklyn, U.S.A.) (*Pro. Pro.*) Dec. 24, 1882. Price 6d.

5,677. J. Barrett, Eastburn. Opening and closing doors in connexion with hoists.

Cams are mounted on the head of the hoist, corresponding with the number of the floors served. As the hoist is approaching a floor the proper cam actuates mechanism which opens the door on that floor. Dec. 27, 1881. Price 6d.

5,679. J. Gillingham, Chard. Fireplaces and stoves.

When the fire is lighted, and the chimney warmed, and the draught established, the register-door is closed, and the draught made to pass through the fire into a chamber below the grate, and thence through side-flues to the chimney. (*Pro. Pro*) Dec. 27, 1881. Price 2d.

5,703. F. Brown, Luton. Cooking-stoves, &c.

To enable the coal to be fed in at the bottom, the bottom of the fireplace is curved upwards till it meets the back, and a trough is formed in front, on which the fresh coal is placed, and then pushed backwards into the fire. The damper in the flue is connected with the sliding plate, by which the top of the fireplace is closed over, so that when this is shut the damper is also closed. A double-cylinder stove has the fire in one cylinder, and the products of combustion are passed into the other, through which air passes in pipes to be warmed. Dec. 28, 1881. Price 8d.

5,735. T. Drake, Huddersfield. Hot-water heating apparatus.

A conical-shaped boiler is heated by a gas-jet, and to the apex and base of the cone are attached the ends of a coil of pipe, through which the water circulates. The coil is placed in a perforated metallic case. Dec. 31, 1881. Price 6d.

† Compiled by Hart & Co., Patent Agents, 28, New Bridge-street.

UNDERTAKERS' MONUMENTS.

In my various wanderings through this country and abroad, churchyards and cemeteries have always had a special attraction for me. I have loved to roam in these abodes of the departed, and gaze on their stately marble monuments, with their lettering, telling of loved ones who have passed away, or to wander in the ancient churchyard of some old picturesque village, where the "iron horse" has not yet reached, along, perhaps, with the venerable sexton who points out to you the "old and curus uns," and strive to decipher some of the quaint doggerel and rhyme to be found engraved on them, one of which I call to mind; it is in memory of a stonemason, and runs thus,—

> "Here lies John Trollope,
> Who caused the stones to roll up,
> When God Almighty took his soul up,
> His body went to fill the hole up."

Another curious one, and which is evidently in memory of a blacksmith, is as follows,—

> "My sledge and hammer lie declined,
> My bellows, too, have lost their wind,
> My fire 's extinct, my forge decay'd,
> And in the dust my bones are laid.
>
> My coals are spent, my iron gone,
> My nails are drove, my work is done,
> My fire-dried corpse here lies at rest,
> My soul (smoke-like) soars to rest."

There seems to me a charm in these old churchyards that is lacking in our large cemeteries, where the eye is so frequently distressed by seeing monuments falling down, many broken, and others on the verge of decay, at least one-half of them appearing to be unsound, and the dates on the stones showing they have only been erected a few years; in fact, monuments erected during the last few years appear to be the very ones that are decaying, whereas those erected a score or more years ago (although dirty and discoloured, which is inevitable in our climate, more or less) are still as sound as when first put up. Why, I would ask, is this? Is the material deteriorated of late years, or is it the fault of the sculptor or mason who executes the work? I have studied this matter a good deal for some time, and have elicited many useful facts from those in the trade, and others, concerning it, and will endeavour to show what I deduce as the cause, and to suggest a remedy.

The material now to be obtained I believe to be as good, if not better, than ever, if properly selected, as, although the English climate is very trying, there is both stone and marble to be got that will resist it; and good granite, if polished, we know to be virtually everlasting, although this, of course, is very expensive for ordinary work; but the trade has of late years gone a great deal out of the hands of the sculptor and mason, to whom it properly belongs, and into those of undertakers and shopkeepers,—*i.e.*, the drapers' and mourning warehouses with undertaking combined, who, of course, know nothing whatever of the trade, their knowledge consisting in pocketing at least twenty per cent. of the total cost of the monument. And what do they do for this? Simply take the order for the monument from their customers and give it to the sculptor or mason to execute, and pocket this handsome percentage for doing what?—why, nothing at all. I am assured, on good authority, that on one of the monuments at Kensal Green Cemetery no less a sum than 200*l.* had been paid to the undertaker for commission; in another case the undertaker was regularly receiving fifteen per cent. on all works executed for or through him, and as the business was transacted through his foreman, he had five per cent. besides. Afterwards the foreman succeeded to his master's business, and he then not only required the fifteen and five per cent. both, but a further five per cent., making twenty-five per cent. commission, or one quarter of the total sum paid for each monument. And these instances could be multiplied, if needed, a hundredfold by those "behind the scenes."

Is it, then, very difficult to fathom the cause of the dilapidated and broken monuments that meet our eye on every side in the cemeteries? I think not. The mason saddled with this heavy incubus of commission, and with competition all round him, purchases the cheapest and most easily worked material that he can, without regard to durability. He naturally thinks that if the undertaker or shopkeeper has twenty per cent. for doing nothing, he at any rate is entitled to twenty per cent. for his trouble in carrying out the work, thus making forty per cent. profit to come out of the work,

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and to gain this he accordingly puts in the cheapest work and material that will "pass" to pay himself. He feels no interest in the work, as he knows the undertaker or shopkeeper will get the credit (if there is any); therefore, all he has to look to is £. s. d., viz., how much he can get out of it; the common remark being, "Oh! anything will do; it is only an undertaker's job." Then afterwards, when the parties who have paid for the work find it is going to pieces, or is inferior to what they expected, they probably complain to the undertaker or shopkeeper whom they ordered it from, and who at once reply, "Oh! we can't help it, we only got it done for you to save you trouble; we don't get anything by it." They may, perhaps, then proceed to the sculptor or mason who really did it, and then, probably, the truth comes out, and they return home with a heartfelt wish that they had been wise in time and gone to the workman direct.

The remedy, then, I think, for this is plain. Let the public resist the cajolery of the undertaker's young man, who, as soon as the corpse is interred, and ofttimes before, brings them designs, and "wish to know what monument they are thinking of having," and "offer to get it done for them to save them trouble"; or will perhaps introduce a mason to them, whom they "can recommend," but which simply means one who will allow them commission. Let them, instead of this, give their order direct to a tradesman who does his own work, and I think we should soon see a marked improvement in the style and execution of work in the cemeteries; the sculptor or mason then has an incentive to do a fair work that it may recommend him in future, and there is then no second profit to pay. Of course, no really first-class firm will, as a rule, accept the work from an undertaker or shopkeeper, as they are well aware it is impossible for them to allow the heavy commission required, and to do a work that is satisfactory to themselves or their customers; but, in the few cases where they do so, the undertaker's commission is added to their price, and the work is, no doubt, then carried out as it should be, but at a considerably enhanced price to what it would have been if the parties ordering had done so first-hand instead of through the undertaker or draper. I cannot myself understand how it is that people of intelligence should be so simple as to expect that the undertaker or draper would trouble about getting their monument done for them if he did not get something out of it, and they may rely that, directly or indirectly, they have to pay pretty heavy for his very small services.

WANDERER.

LABOUR IN MELBOURNE.

SIR,—The letter of "One not Blessed with Incumbrances," in the *Builder* of April 15th last, has been read by me in Melbourne.

I am perfectly at a loss to understand why such a *bonâ fide* London tradesman as the writer of that letter is consents to lose his time, waste his energies, and be "wearied by overwork and bad debts," when the state of our labour market here offers so many and so great inducements to him and others like him.

I send you the *Argus* summary of this date (June 19th), and have marked the "Labour Market" article and the paragraph specially instructive to the writer of the letter alluded to.

I have been in practice here as an architect for more than a quarter of a century, and during all that time the occasions have been very few and far between on which a really skilled workman need have been one week out of work. Just now there is, and for twelve-months past there has been, a scarcity of tradesmen. Contractors will hardly take the trouble to tender for works, as their hands are so full. A few weeks ago I called for tenders for additions to a house about seven miles from here, and only one man thought it worth while to tender for it. I assure you there is no "patient misery" among tradesmen here, for they can and do pick and choose when, where, and for whom they will work, and they often refuse a job when the building is not conveniently near to their houses. Pray let your readers at home know as soon as possible the rates that skilled workmen of the various trades can command here, for the *Argus* rather understates than overstates the mark.

Many people just now are deterred from building in consequence of the paucity of tradesmen, their number being greatly below our requirements. The sooner we get a supply of good steady skilled operatives here the better for themselves and for all classes of the community. I speak from experience, and assure you I have now several buildings in abeyance for the reasons above mentioned. There is abundance of capital and enterprise here, and an ample field for thorough tradesmen, whether blessed with incumbrances or not.

F.R.I.B.A., and
Hon. Sec. for Melbourne.

The following is the quotation in question:—

Building Trades.—Plasterers from 10s. to 11s. per day; carpenters, 10s. per day; bricklayers, 11s. per day; plumbers, 10s. per day; joiners, 10s. per day; masons, 10s. per day; slaters, 12s. per day; labourers, from 6s. to 7s. per day; pick-and-shovel men, 6s. 6d. per day.

COMPETITION FOR THE GOVERNMENT OFFICES.

SIR,—When the Civil Service Estimates were moved on the 24th of last month, the First Commissioner of Works and Public Buildings said, in reply to Lord Elcho, that "some of the best architects declined to compete if it were an open competition, on the ground of the great expense of preparing designs."

As the expense will be the same, whether an open or a limited competition be adopted, it is clear, I think, that the real objection is solely to the open competition. Such a position is, it appears to me, so unworthy of the leaders of the profession that I should like, if you permit, to say a few words in support of Lord Elcho's strong recommendation of a public competition for the War and Admiralty Offices.

The excellent position which the seniors have acquired surely gives them the best chance of success, whether the limited or unlimited plan be adopted. What more can they desire? If they are afraid of the damaging effect of their possible defeat by some architect of inferior rank, the secrecy of mottoes to the designs will prevent the public record of their misfortune. In architecture, as in other things, public competition is an excellent means of keeping men up to the mark, and, in my own opinion, of advancing the art itself. There is no better test of high merit than success in it.

The position of "the best architects" has been obtained by public competition. Mr. Waterhouse was known only in a limited sphere until he won the Manchester Assize Courts competition. That building at once gave him his well-deserved rank. The late Mr. Street was thought to be a church architect only until he won that for the Royal Courts of Justice, when he immediately took full honours. And so of many others.

Will the Government, then,—permitted to tax the nation, bound to do all they can to promote and advance art in the most liberal manner possible, intrusted with a department for this special purpose,—lend themselves to this ungenerous attempt to confine the chance for this great prize to a favoured few? In the interest of our art it is to be hoped that Mr. Shaw-Lefevre will not listen to assertions based upon selfish motives, but will place all architects who feel they have the requisite experience to carry out a great public work on the same footing. The expense and uncertainty of the contest is sure to keep unsuitable and incompetent men out of it.

I have ventured thus to write because I am convinced that there is much more advantage in public than limited competition, and that the Government should do all they can to encourage our art in the most liberal manner possible, and without favour to one class or another. Who can say that an open competition may not be the means of making known a worthy successor of Wren, or Chambers, or Barry, or Street?

AUDI ALTERAM PARTEM.

THAMES COMMUNICATIONS.

SIR,—I have seen Mr. Trickett's letter [p. 160, *ante*], but in relation thereto would utter a word of censure; for although there have been numerous demonstrations of public feeling, and the necessity for means of communication is admitted, there is not that hearty co-operation between the East London and South London authorities that there should be. This, I suppose, arises from that pervading selfishness which puts local above general interests. While the committee of which Mr. Trickett is treasurer devotes itself to the main point of affirming the necessity for "means of communication," the authorities of Whitechapel take it upon themselves to assert that a low-level bridge at the Tower is *the* panacea for the evils that afflict the traffic of East and South London. A little lower down, the Limehouse District authorities, representing Shadwell, Wapping, Ratcliff, and Limehouse, favour a communication by way of tunnel; while lower down the river still, in Millwall and Poplar, satisfaction would be given by the institution of a system of ferries. Having regard to the furious opposition to a bridge scheme which would be encountered from the wharfingers of the Thames near London Bridge, it really appears expedient that the inhabitants of the districts concerned should make up their minds and agree to agitate for a tunnel and one or two steam ferries or floating bridges. Public opinion has been awakened to the necessity, but it is now time that the steps to be taken to relieve that necessity should be indicated.

OBSERVER.

"A CARD."

SIR,—I clip the following from a Welsh newspaper, suppressing name, address, &c.:—

MR. ——— ———, R.I.B.A.,
ARCHITECT,
OF ———, ———,
Begs to inform the Residents of ——— and Neighbourhood that he has opened commodious Offices at ——— BUILDINGS, ——— STREET, ———.

MR. ——— has been successful in all the important Competitions in ——— and vicinity for some years. Amongst other local premated designs being the ———, &c., and has also several large Contracts, which are being carried out under his supervision in this District.

All commands of his Clients will receive his Personal Attention; in addition to that of a Competent Staff who has been engaged in order to expedite all work that may be entrusted to him.

Clients may be supplied with Preliminary Drawings for approval. Dilapidations reported upon.

AN ASSISTANT WANTED.

The advertiser, if he be a member of the Royal Institute of British Architects, does not specify whether he belongs to the class of Associates or that of Fellows, and therein he resembles certain Associates of the Institute who habitually dub themselves "M.R.I.B.A." (initials which, I believe, are not recognised by the Institute), confident that the public do not know that there are two classes of professional members of the Institute. Is advertising in this way legitimate,—I will not say dignified? What would be thought of a solicitor or medical man who issued such an advertisement as the foregoing?

ONE OF THE PUBLIC.

MONUMENTAL.

PROFESSOR HOWALDT, of Brunswick, is now occupied upon a colossal figure of Germania, intended to form part of the Monument of Victory at Leipsic. The statue will not be cast, but will be executed in hammered copper, in which class of work the professor is said to have gained distinction. The attitude in which the figure is represented is typical of the armed neutrality of the Fatherland at the present time. Although considerable progress has been made with the work, its completion is not expected until towards the close of next year.

WHAT IS A BUILDING?

A CASE of some importance has been heard before Mr. Ellison at the Lambeth Police Court. Mr. Banister Fletcher, the district surveyor, contended that the erection, which was 19 ft. long, 12 ft. wide, and 14 ft. high to the apex, and which was enclosed at the back and at one end, was a building, and therefore subject to the rules of the Metropolitan Building Act. Mr. Fullagar, solicitor, appeared for the owners,—the St. James's Home for Inebriates,—and contended that it was not a building within the Act, and if it were, it was exempt, being 60 ft. from any other building. The case was adjourned.

On Wednesday in last week the magistrate said he felt compelled reluctantly to decide in favour of the district surveyor, and the order was made to amend the work as he required.

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STATE OF THE LABOUR MARKET.

NATIONAL ASSOCIATION OF MASTER BUILDERS OF GREAT BRITAIN.—The following is a comparative statement showing the Hours worked per Week, and the Rate of Wages per Hour, in the various Branches of the Building Trade in the undermentioned Towns.—W. Knox, Secretary.

Abbreviations:—dy, day; lt-dk, light to dark; s, shop; b, building; wk, week; a, average; tm, time; t s, time sheet; t, town; c, country. Towns marked * have not made any return since January, 1882.

TOWN.	MASONS.				BRICKLAYERS.				CARPENTERS AND JOINERS.				PLASTERERS.				SLATERS.				PLUMBERS.				PAINTERS.				MASONS' LABOURERS.				BRICKLAYERS' LABOURERS.				PLASTERERS' LABOURERS.			
	Summer.		Winter.		Summer.		Winter.		Summer.		Winter.		Summer.		Winter.		Summer.		Winter.		Summer.		Winter.		Summer.		Winter.		Summer.		Winter.		Summer.		Winter.		Summer.		Winter.	
	Hours worked per Week.	Rate of Wages per Hour.	Hours worked per Week.	Rate of Wages per Hour.	Hours worked per Week.	Rate of Wages per Hour.	Hours worked per Week.	Rate of Wages per Hour.	Hours worked per Week.	Rate of Wages per Hour.	Hours worked per Week.	Rate of Wages per Hour.	Hours worked per Week.	Rate of Wages per Hour.	Hours worked per Week.	Rate of Wages per Hour.	Hours worked per Week.	Rate of Wages per Hour.	Hours worked per Week.	Rate of Wages per Hour.	Hours worked per Week.	Rate of Wages per Hour.	Hours worked per Week.	Rate of Wages per Hour.	Hours worked per Week.	Rate of Wages per Hour.	Hours worked per Week.	Rate of Wages per Hour.	Hours worked per Week.	Rate of Wages per Hour.	Hours worked per Week.	Rate of Wages per Hour.	Hours worked per Week.	Rate of Wages per Hour.	Hours worked per Week.	Rate of Wages per Hour.	Hours worked per Week.	Rate of Wages per Hour.
Aberdeen	51	6	45	6	no	ne employed			51	6	45	6	51	6½	40	6½	51	6½	40	6½	51	7	51	7	51	6½	39	6½	51	4½	45	4½	..	not given			54	4½	40	4½
Ashton-under-Lyne	54½	8	lt dk	8	54½	8	lt dk	8	54½	7½	47	7½	54½	8	lt dk	8	54½	8	lt dk	8	54½	8	lt dk	8	54½	7½	lt dk	7½	54½	5	lt dk	5	54½	5 to 5½	lt dk	5 to 5½	54½	5	lt dk	5
Alderley Edge	49½	8¼	42½	8¼	54½	8	47	8	54½	30/wk.	54½	30/wk.	54½	8	54½	8	54½	7	49½	7½	54½	7	49½	7	49½	5½	42½	5¼	54½	5½	47	5½	54½	5½	47	5½	54½	5½	54½	5½
Altrincham	49½	8	48½	8	54½	8	44	8	54½	8	47	8	54½	8	47	8	54½	7½	47	7½	54½	8	47	8	54½	7	44	7	..	..	..	..	54½	5½	44	5½	54½	5½	47	5½
Bradford	49½	6½ to 7	45	6½ to 7	49½	6½ to 7	45	6½ to 7	49½	6 to 7	49½	6 to 7	49½	7	47	7	49½	6½ to 7	42	6½ to 7	49½	6½	49½	6½	52	6½ to 7	lt dk	6½ to 7	49½	4½ to 5	45	4½ to 5	49½	4½ to 5	45	4½ to 5	49½	5	47	5
Bristol	54	6 to 7½	48	6 to 7½	54	6 to 7½	48	6 to 7½	54	6 to 7	48	6 to 7	54	7	48	7	54	7	48	7	54	7	48	7	54	6 to 7	48	6 to 7	54	4 to 5	48	4 to 5	54	4 to 5	48	4 to 5	54	4 to 5	48	4 to 5
Beverley	55½	7	50	7	55½	6½	50	6½	55½	6	55½	6	55½	7	50	7	..	not given			55½	7	50	7	..	not given			55½	4½	50	..	55½	4½	50	..	55½	4½	50	..
*Barnsley	50	7½	a44½	7½	50	7½	a44½	7½	50	7½	50	7½	50	7½	45	7½	50	7	44	7	50½	7½	50½	7½	49	7¼	46	7¼	50	5	44½	5	50	5	44½	5	50	5	45	5
Barrow	54	7¾	a46½	7¾	54½	8½	a48½	8½	54	7¾	49	7¾	54	7½	47	7½	54	7	47	7	54	7½	54	7½	54	7½	49	7½	54	24/wk	a46½	20/8 w	54½	6	a48½	6	54	24/wk	47	21/wk
Bolton	48½	8½	45½	8½	49½	9	47	9	54½	8	49½	8	52	8	41½	8	49½	5/6 day	lt dk	5/6 day	52	8	47	8	52½	7	39	7	48½	5¼	45½	5¼	49½	6	47	6	52	6	41½	6
Birmingham	54	8½	47¼	8½	54	7¾	47¾	7¾	54	7¾	47¼	7¾	54	7¾	47¼	7¾	..	piece	wrk	..	56½	7	50½	7	56½	7	50½	7	54	5	47¾	5	54	5	47¾	5	54	5	47¼	5
*Blackburn	49	8½	44	8½	49	36/wk	44	33/wk	49	7½	49	7½	49	36/wk.	44	33/wk.	49	8½	44	8½	49	8½	49	8½	54	8	46½	8	49	20/ 22/	44	18/ 20/	49	24/wk	44	22/wk	49	26/wk	44	24/wk
Cambridge	56½	7 to 7½	50½	7 to 7½	56½	6 to 7	50½	6 to 7	56½	6 to 7	50½	6 to 7	56½	7 to 8	50½	7 to 8	60to65	6½ to 7	piec	e work	56½	6½ to 7	50½	6½ to 7	56½	6 to 7	50½	6 to 7	56½	4	50½	4	56½	3½ to 4	50½	3½ to 4	56½	3½ to 4	50½	3½ to 4
Coventry	56½	7½	51	7½	56½	7	51	7	56½	7	51	7	56½	7	51	7	56½	7	51	7	56½	7	51	7	56½	6¾	51	6¾	56½	5	51	5	56½	4¾	51	4¾	56½	4¾	51	4¾
*Canterbury	60–70	6½	60	6½	60-70	6 & 6½	54	6 & 6½	60–70	6 to 6½	60	6 to 6½	65	7½	54	7½	60–70	6½	54	6½	60–70	6½	60	6½	60–70	5½	54	5½	60-70	4	54	4	60-70	3¾	54	3¾	60-70	4	54	4
Cardiff	54	7½	50½	7½	54	7½	50½	7½	54	7½	50½	7½	54	7½	50½	7½	54	7½	50½	7½	54	7 to 7½	50½	7 to 7½	54	6½ to 7	50½	6½ to 7	54	4 to 5	50½	4 to 5	54	4 to 5	50½	4 to 5	54	4 to 5	50½	4 to 5
*Cirencester	56½	5½	56½	5½	56½	6	56½	6	56½	5¼	56½	5¼	56½	6	56½	6	56½	6	56½	6	56½	6	56½	6	56½	5	56½	5	56½	3¾	56½	3¾	56½	3¾	56½	3¾	56½	3¾	56½	3¾
*Cheadle	49½	8	41½	8	49	8	45	8	54½	7½	52	7½	54½	7	47	7	54½	7	45	7	54½	7½	52	7½	54½	7	47	7	49½	5½	41½	5½	49½	5½	45	5½	54½	5	47	5
*Chichester	58	7	47	7	58	6	47	6	58	6	47	6	58	6	47	6	58	6	47	6	58	8	47	8	58	6	47	6	58	4	47	4	58	4	47	4	58	4	47	4
Crewe	55½	7¾	55½	7¾	55½	7¾	55½	7¾	55½	7	55½	7	55½	6/ dy.	55½	6/ dy.	55½	7½	55½	7½	55½	32/wk	55½	32/wk	55½	7	55½	7	55½	4¾	55½	4¾	55½	4¾	55½	4¾	55½	5	55½	5
*Chatham	56½	7½ to 8	54	7½ to 8	56½	7 to 8	54	7 to 8	56½	7 to 7½	54	7 to 7½	..	..	..	..	..	..	..	..	56½	7 to 7½	54	7 to 7½	56½	6½ to 7	54	6½ to 7	56½	4½	54	4½	..	..	..	..	..	..	..	..
*Chorley	48½	8½	..	..	54½	8½	..	..	54½	7½	..	..	54½	7	..	..	54½	7	..	..	54½	7½	47	7½	48½	6	..	..	54½	6½	..	..	54½	5½	..	..	54½	5½	..	..
Carlisle	51	6½	44½	6½	51	6½	44½	6½	54	6	54	6	54	6¾	51	6¾	51	6½	44½	6½	54	7¼	54	7¼	54	6½	40	6½	51	4¼	44½	4¼	51	4¼	44½	4¼	54	5	54	5
Crieff	51	6	45	6	..	..	..	..	51	5	40	5	51	7	40	7	60	6	45	6	51	6	51	6	57	6	41	6	51	5	45	4	..	..	..	..	..	..	..	..
Croydon	61	8½	50	8½	61	8½	50	8½	61	8½	50	8½	61	9	50	9	..	piece	wrk	..	61	9	50	9	61	7½	50	7½	61	6	50	6	61	5½	50	5½	61	6	50	6
Cupar-Fife	51	5½	45	5½	..	..	..	..	51	5 to 6	51	5 to 6	51	..	41	..	51	5 to 6	41	5 to 6	51	5½ to6½	51	5½ to6½	57	5½ to6½	41	5½ to6½	51	3½ to 4	41	3½ to 4	..	..	..	..	51	5 to 6	41	5 to 6
Dover	54	8	54	8	56½	7½	55	7½	56½	7½	56½	7½	54	8	54	8	54	8	54	8	54	8	54	8	56½	6	56½	6	54	4½	54	4½	56½	4½	55	4½	56½	5	54	5
Doncaster	54	7	a44¼	7	54	7	a44¼	7	54	7	47½	7	54	7	a44¼	7	54	7	a44¼	7	54	7	47½	7	54	6	a44¼	6	54	4½ to 5	a44¼	4½ to 5	54	4½ to 5	a44¼	4½ to 5	54	4½ to 5	a44¼	4½ to 5
Droylsden	49½	8	47	8	54½	8	47	8	54½	7½	47	7½	54½	7½	47	7½	54½	8	47	8	54½	7½	47	7½	..	not given			49½	5½	47	5½	54½	5	47	5	54½	5½	47	5½
Devizes	59	5½ to 7	57½	5½ to 7	59	5 to 6	57½	5 to 6	59	5 to 5½	59	5 to 5½	59	5½ to 6	57½	5½ to 6	59	5½ to 6	57½	5½ to 6	59	6	57½	6	59	5 to 6	57½	5 to 6	59½	3 to 3½	57½	3 to 3½	59	3 to 3½	57½	3 to 3½	59	3 to 3½	57½	3 to 3½
Dorchester	65	6	48	6	65	5½	48	5½	65	5½	48	5½	65	5½	48	5½	65	5½	48	5½	60	6	48	6	60	5½	48	5½	65	4	48	4	65	3½	48	3½	65	3½	48	3½
Derby	56	7½	50½	7½	56	7½	50½	7½	56	7½	53½	7½	56	7½	50½	7½	56	7½	50½	7½	56	7½	53½	7½	56	7	47½	7	56	5	50½	5	56	4½	50½	4½	56	5½	50½	5½
Dudley	54	7	51½	7	54	6½	51½	6½	54	6½	53	6½	54	7	51½	7	54	7	51	7	54	7½ to 8	51	7½ to 8	54	6 to 6½	52½	6 to 6½	54	4	51½	4	54	4	51½	4	54	4½	51½	4½
*Durham	49½	7½	..	..	49½	7½	..	..	53	6¾	53	6¾	53	7½	53	7½	49½	7¼	..	..	53	7	53	7	53	7 to 8	..	..	49½	4¾	..	..	49½	4¾	..	..	..	..	..	..
Darlington	49½	7¾	44½	7¾	49½	7½	44½	7½	50	7	50	7	49½	7½	44½	7½	53	30/ wk	44½	30/ wk	53	32/wk	..	..	53	6½	40	6½	49½	5½	44½	5½	49½	5½	44½	5½	49½	5	44½	5½
Dalkeith	51	6 to 6½	42	6 to 6½	56	6½	42	6½	51	6½	42	6½	51	7	42	7	51	7	42	7	51	6½	51	6½	57	7 to 7½	41	7 to 7½	51	17/wk	45	17/wk	56	4	42	4	51	20/wk	40	17/wk
Dunse	51	6	40	6	..	..	..	..	51	6	43	6	51	6	40	6	51	6	40	6	51	6½	51	6½	51	7	40	7	51	4	40	4	..	..	..	..	51	4	40	4
Dundee	..	not given	..	..	..	not given	..	..	..	not given	..	..	..	not given	..	..	..	not given	..	..	..	not given	..	..	..	not given	..	..	..	not given	..	..	..	not given	..	..	..	not given	..	..
Eccles	49½	8	lt dk	8	54½	8 to 8½	lt dk	8 to 8½	54½	7 to 8	lt dk	7 to 8	54½	7 to 8	lt dk	7 to 8	54½	7½	lt dk	7½	54½	8	lt dk	8	54½	7½	lt dk	7½	49½	5	lt dk	5	54½	5 to 6	lt dk	5 to 6	54½	5 to 5½	lt dk	5 to 5½
Edinburgh	51	6½	a45	6½	51	7	a42	7	51	6½	45b5ls	6½	51	6½	a42	6½	51	7	45	7	51	6½	46	6½	51	7	39	7	51	4½	a45	4½	51	5	a42	5	51	5	a42	5
Folkestone	56½	7 to 8	51½	7 to 8	56½	7 to 7½	51½	7 to 7½	56½	7 to 7½	56½	7 to 7½	56½	7½ to 9	56½	7½ to 9	..	..	..	..	56½	8	56½	8	66½	6½	51½	6½	56½	4½ to 5	51½	4½ to 5	56½	4½ to 5	51½	4½ to 5	56½	4½ to 5	51½	4½ to 5
Glasgow	51	6½	41	6½	51	8	45	8	51	7	45	7	51	6½	41	6½	51	7	45	7	51	7	45	7	56	7	45	7	51	4½	41	4½	51	4½	45	4½	51	5	41	5
Greenock	51	6½	44	6½	51	7	44	7	51	7	51	7	51	7½	39	7½	51	7	45	7	51	..	51	..	56	7	40	7	51	5	44	5	51	5	44	5	51	20/wk	39	20/wk
Guildford	56½	7½ to 8	50½	7½ to 8	56½	7 to 7½	50½	7 to 7½	56½	7	50½	7	56½	8	50½	8	..	piece	wrk	..	56½	8	50½	8	56½	6½	50½	6½	56½	5	50½	5	56½	4½	50½	4½	56½	5	50½	5
Gloucester	56½	6½	50½	6½	56½	7	50½	7	56½	6½	56½	6½	56½	6½	..	6½	56½	6½	50½	6½	56½	7	56½	7	56½	6	45	6	56½	3¾	..	3¾	56½	3¾	..	3¾	56½	3¾	..	3¾
Helensburgh	51	6½	45	6½	51	7	45	7	51	7	45	7	51	7	45	7	51	7	45	7	51	7	45	7	60	7 to 7½	45	7	51	4½	45	4½	51	4½	45	4½	51	5	45	5
Huddersfield	52½	7½	42	7½	52½	7½	42	7½	50	7	50	7	50	7¼	50	7¼	53	7	53	7	52½	7	52½	7	53½	6½	..	..	52½	5	42	5	52½	5	42	5	50	5¾	50	5¾
Holmfirth	50	32/wk	..	..	..	..	..	..	50½	6 to 6¼	lt dk	..	..	..	..	..	..	..	..	..	50½	7	50½	..	..	..	..	..	50	22/ 24/	..	..	..	..	..	..	..	..	..	..
*Hartford	55½	6 to 7	53	6 to 7	55½	7	53	7	55½	6 to 7	53	6 to 7	55½	8½	53	8½	55½	7	53	7	55½	6 to 7	53	6 to 7	55½	6 to 7	53	6 to 7	55½	4½	53	4½	55½	4½	53	4½	55½	5½	53	5½
*Halifax	49½	34/wk	..	32/wk	49½	34/wk	..	32/wk	50	7	50	7	50	7¼	..	..	50	7¼	..	..	50	7¼	50	..	..	..	..	..	49½	22/wk	..	21/wk	49½	22/wk	..	21/wk	..	..	..	..
Hull	53	7½	47	7½	53		47		53		47	7	53	7	47	7	53	7	47	7	53	8	47	8	53	7	47	7	53	5½	47	5½	53	5½	47	5½	53	5½	47	5½

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Hastings and St. Leonards-on-Sea	56½	8	50½	8	56½	7	50½	7	56½	7	50½	7	56½	8	50½	8	..	piece	wrk	..	56½	8	50½	8	56½	6½	50½	6½	56½	5	50½	5	56½	5	50½	5	56½	5	50½	5
Hamilton	51	6½	45	6½	56	8	45	8	51	6	46	6	51	7	46	7	51	6½	46	6½	51	5½ to 7	51	5½ to 7	56	7	45	7	51	4½	45	4½	56	5½	45	5½	51	5	46	5
Hartlepools	49½	8	40	8	53	7½	45	7½	54	7	54	7	53	7½	45	7½	54	7¼	45	7¼	54	7¼	54	7¼	54	7	36	7	49½	5½	54	5½	53	5½	45	5½	53	5½	45	5½
Hawick	51	7	lt dk	7	..	..	..	..	51	7	..	..	51	6	lt dk	..	51	7	lt dk	..	51	7 to 7½	51	7 to 7½	56	7	lt dk	7	54	4	lt dk	4	..	..	..	..	..	..	..	..
Inverness	51	6	40	6	51	6	40	6	51	5½	40	5½	57	6	40	6	57	6	40	6	57	5¼	57	5¼	57	6	40	5½	60	3½	42	3½	60	3½	42	3½	60	4	42	4
Kidderminster	56½	7¼	50½	7¼	56½	6¾	50½	6¾	56½	7	50½	7	56½	7	50½	7	56½	7	50½	7	56½	6½	50½	6½	56½	6	50½	6	56½	4½	50½	4½	56½	4½	50½	4½	56½	4½	50½	4½
Lancaster	49½	7½	45	7½	54½	8	45	8	55½	6¾	55½	6¾	54½	7¼	45	7¼	54½	7¼	45	7¼	54	6½	54	6½	56½	6¾	45	6¾	49½	5	45	5	54½	5¼	45	5¼	54½	5¼	45	5¼
Liverpool	55	8	a44¾	8	55	8	47½	8	55	7½	47½	8¼	55	8	47½	8	55	8	47½	8	55	8	47½	8	55	7¼	47½	7¼	55	5¼	a44¾	5¼	55	5¼	47½	5¼	55	5½	47½	5½
London	52½	9	47	9	52½	9	47	9	52½	9	52½s 47b	9	52½	9	47	9	56½	9	51½	9	47	10	47	10	52½	8½	48	8½	52½	6	47	6	52½	6	47	6	52½	6	47	6
Leeds	50	8	t s	8	50	8	t s	8	50	7½	50	7½	49½	8	44	8	50	8	t s	8	50	7½	50	7½	56	7	lt dk	7	50	5	t s	5	50	5	t s	5	49½	6	44½	6
Lewes	61	7½ to 8½	53	..	61	6 & 6½	53	6 & 6½	61	6 & 6½	53	6 & 6½	61	8	53	8	done by bricklayers				61	7½ to 8	55	7½ to 8	61	6 to 6½	53	6 to 6½	61	5	53	5	61	3½ to 4½	53	3½ to 4½	61	3½ to 4½	53	3½ to 4½
*Leicester	56½	8½	50	8½	54	7½	50	7½	56½	7½	56½	7½	56	8	50	8		piece	wrk		56½	8	54	8	..	..	..	..	56½	6	50	6	54	4½ to 5	50	4½ to 5	56	5	50	5
Lincoln	53½	7	53½	7	53½	6¾	47½	6¾	54	6¾	47½	6¾	53½	7	47½	7	53½	7	47½	7	53½	6¾	47½	6¾	54	6½	47½	6½	53½	4¼	53½	4¼	53½	4	47½	4	53½	4¼	47½	4¼
Leith	51	6½	a45	6½	51	7	a42	7	51	6½	51s 45b	6½	51	6½	a42	6½	51	7	45	7	51	6½	46	6½	51	7	39	7	51	4½	a45	4½	51	5	a42	5	51	5	a42	5
Manchester	49½	8	a44	8	54½	8½	41½	8½	54½	8	47	8	52	8	47	8	54½	8	lt dk	8	54½	8	47	8	54½	7	47	7	49½	5	a44	5	54½	5½	41½	5½	52	5¾	47	5¾
Macclesfield	54½	7½	47	8¼	54½	7½	47	8¼	54½	7¼	47	7½	54½	33/wk.	47	30/wk.	54½	7	47	7½	54½	6½	54½	6½	54½	6	54½	6	54½	4½	54½	4½	54½	4¾	47	5⅛	54½	21/wk.	54½	21/wk
Mirfield	49½	7½	lt dk	7½	49½	..	lt dk	..	52½	6½	52½	6½	49½	7	49½	7	52½	29/30/	52½	29/30/	50	7¼	50	7¼	52½	6½	..	..	49½	5¼	49½	5¼	49½	5¼	49½	5¼	49½	5¼	49½	5¼
Montrose	51	6	40	6	51	7	40	7	51	6	51	6	51	6	lt dk	6	56	6½	40	6	51	5 to 6½	51	5 to 6½	56	6 to 7	..	6 to 7	51	4	40	4	51	4	40	4	51	3½	lt dk	3½
Northampton	54	8	50	8	54	7	51	7	54	7	51	7	54	7	51	7	..	..	..	..	54	7½ to 8	51	7½ to 8	54	7	48	6½	54	5	59	5	54	4½	51	4½	54	4½	51	4½
*Newport (Mon.)	54	6½	54	6½	54	6½	54	6½	54	6½	54	6½	54	6½	54	6½	54	6½	54	6½	54	6½	54	6½	54	6	54	6	54	4	54	4	54	4	54	4	54	4	54	4
North Shields	50	8	50	7¼	50	8	50	7¼	50	7½	50	7½	50	8	50	8	50	7¼	37	7¼	59	6¾	59	6¾	50	7½	44	7½	50	5	50	5	50	5	50	5	50	5½	50	5½
Nottingham	52	9	42	9	54	8	42	8	54	8½	47s 42b	8½	54	8½	47½	8½	..	..	..	..	54	8½	47½	8½	56	8	..	..	52	5½ & 6½	42	5½ & 6½	54	5½	42	5½	..	..	..	..
Northwich	55½	6 to 7	53	6 to 7	55½	7	53	7	55½	6 to 7	53	6 to 7	55½	8½	53	8½	55½	7	53	7	55½	6 to 7	53	6 to 7	55½	6 to 7	53	6 to 7	55½	4½	53	4½	55½	4½	53	4½	55½	5½	53	5½
*Oxford	54	8	54	8	54	7	53½	7	54	7½	54	7½	54	7½	53½	7½	54	7½	53½	7½	not	given	not	given	not	given	not	given	54	4¼	54	4¼	54	4	53½	4	54	4	53½	4
Oldham	48½	8½	43	8½	48	8	46	8	51½	7½	46½	7½	48½	8	46	8	48½	8	46	8	52½	7½	52½	7½	52½	7	52½	7	48½	5½	43	5½	48	5½	46	5½	48½	6	46½	6
Paisley	51	7	42	7	51	8	42	7	51	7	45	7	51	6½ to 7	39	6½ to 7	51	7	45	7	51	7	50	7	56	7	40	7	51	4½ to 5	42	4½ to 5	51	4	42	4	51	18/wk.	39	18/wk
Perth	51	6 to 6½	42	6 to 6½	51	8	42	8	51	6	45b 51s	6	51	6½	42	6½	51	6½	42	6½	51	6½	51	6½	51	6½	42	6½	51	4	42	4½	51	5	42	5½	51	4	42	4½
Portsmouth	56½	7½	51	7½	56½	7	51	7	56½	6½	51	6½	56½	7	51	7	56½	9	51	9	56½	6½	51	6½	56½	5½ to 6	51	5½ to 6	56½	4½	51	4½	56½	4½	51	4½	56½	4½	51	4½
Preston	49½	8½	lt dk	8½	49½	36/wk	lt dk	36/wk	49½	7¼ to 7½	49½	7¼ to 7½	49½	33/wk.	49½	33/wk.	49½	33/wk	lt dk	33/wk	49½	34/wk	lt dk	34/wk	49½	7½	lt dk	7½	49½	26/wk	lt dk	24/wk	49½	24/26/	lt dk	24/26/	49½	21/24/	lt dk	21/24/
Plymouth	56½	6½ to 7	50½	6½ to 7	56½	6½ to 7	50½	6½ to 7	56½	5½ to 6½	50½	5½ to 6½	56½	5 to 7	50½	5 to 7	56½	6 to 7	50½	6 to 7	58	24/30/	52	24/30/	56	23/29/	56	23/29/	56½	3½ to 4¾	50½	3½ to 4¾	56½	3½ to 4¾	50½	3½ to 4¾	56½	3½ to 4½	50½	3½ to 4½
*Pontefract	55	7	45	7	55	7	45	7	55	7	55	7	50	7½	50	7½	50	30/wk	50	30/wk	55	7½	44½	7½	55	6	44½	6	55	4½	45	4½	55	4½	45	4½	50	5	50	5
Rochdale	48½	8	lt dk	8	48½	8	lt dk	8	48½	7 to 8	lt dk	7 to 8	48½	7 to 8	lt dk	7 to 8	49½	7½ to 8½	lt dk	7½ to 8½	48½	7	48½	7	49½	6½ to 8	lt dk	6½ to 8	48½	4¾ to 5	lt dk	4¾ to 5	48½	4½ to 5	lt dk	4½ to 5	48½	5 to 5½	lt dk	5 to 5½
*Runcorn	55½	7½	48	7½	55½	7¾	48	7¾	55½	7¼	55½	7¼	55½	7½	48	7½	55½	7¾	48	7¾	55½	7½	48	7½	55½	28/wk.	48	28/wk.	..	..	..	..	55½	4¾	48	4¾	55½	4¾	48	4¾
Reading	55½	8	50	8	56½	6½ to 7	56½	6½ to 7	56½	7 to 7½	56½	7 to 7½	56½	7½	56½	7½	..	..	..	..	..	..	..	..	..	..	..	..	56½	4½ to 5	56½	4½ to 5	56½	4½	56½	4½	56½	4½	56½	4½
Radcliffe	49½	8	..	..	49½	8	..	..	49	8	44	8	49	8	..	..	54	8	..	..	49	8½	..	..	49	7½	..	..	49	6½	..	..	49	5½	..	..	49	6	..	..
Rugby	55½	7½	55½	7½	56½	7 to 7½	53½	7 to 7½	56½	7 to 7½	56½	7 to 7½	56½	7½ to 8	53½	7½ to 8	56½	7½	53½	7½	56½	7½ to 8	53½	7½ to 8	56½	6½	53½	6½	56½	4 to 4¼	53½	4 to 4¼	56½	4 to 4¼	53½	4 to 4¼	56½	4½	53½	4½
Sheffield	49½	8	47	8	49½	8	47	8	49½	7½	49½	7½	49½	8	47½	8	49½	8	47½	8	49½	8	47½	8	56½	7	40	7	49½	5	47	5	49½	5	47	5	49½	5	47	5
Southampton	56½	7	56½	7	56½	6 & 7	56½	6 & 7	56½	6 to 7	56½	6 to 7	56½	6 to 7	56½	6 to 7	..	piece	wrk	..	56½	7	56½	7	56½	6 to 7	56½	6 to 7	56½	4	56½	4	56½	4	56½	4	56½	4	56½	4
St. Helens	55	8	a44¾	8	55	8	47½	8	55	7½	55	7½	55	8	47½	8	55	6¾	55	6¾	55	7½	55	7½	55	6½	55	6½	55	4¼	55	4¼	55	5¼	47½	5¼	55	5¼	47½	5¼
South Shields	50	7½	44½	7½	50	7¾	44½	7¾	50	7½	50	7½	50	33/wk.	50	33/wk.	50	30/wk	50	30/wk	54	7½	54	7½	50	33/wk.	..	..	50	5	44½	5	50	5	44½	5	50	5	50	5
*Southport	49½	8¾	44	8¾	49½	8	47	8	49½	7½	47	7½	49½	33/wk.	lt dk	30/wk.	49½	33/wk	lt dk	30/wk	49½	33/wk	47	30/wk	49½	7½	..	..	49½	23/wk	..	..	49½	23/wk	..	..	49½	23/wk.	..	..
Sunderland	50	7¼	45½	7¼	50	7¼	45½	7¼	50	7¼	50	7¼	50	6¾ to 7¼	50	6¾ to 7¼	50	6¾ to 7½	45½	6¾ to 7½	50	6 to 7½	50	6 to 7½	53	6½ to 7¼	45	6½ to 7¼	50	4½ to 5¼	45	4½ to 5¼	50	4½ to 5¼	45	4½ to 5¼	50	4½ to 5¼	45	4½ to 5¼
Shrewsbury	56½	7	50½	7	56½	6 to 6½	50½	6 to 6½	56½	6 to 6½	56½	6 to 6½	56½	6 to 6½	50½	6 to 6½	56½	6 to 6½	50½	6 to 6½	56½	6½ to 7	50½	6½ to 7	56½	6	50½	6	56½	4 to 4½	50½	4 to 4½	56½	3¾	50½	3¾	56½	3¾	50½	3¾
Scarborough	52	7½	a44¼	7½	52	7½	a44¼	7½	52	7	a44¼	7	52	7½	a44¼	7½	52	30/wk	47	30/wk	53	7½	47	7½	55½	6½	44	6½	52	5	a44¼	5	52	5	a44¼	5	52	5	a44¼	5
*Salisbury	56½	7½	50	7½	56½	6	50	6	56	6½	56½	6½	56½	7	50	7	56½	7	50	7	56½	7	56½	7	56½	5½	50	5½	56½	3½	50	3½	56½	3½	50	3½	56	3½	50	3½
*Staffordshire Potteries and Newcastle District	55½	7¼	48	7¼	55½	7¼	48	7¼	56½	7	50½	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	55½	4 to 4½	48	4 to 4½	..	..	..	..
Stirling	51	6 to 6½	a39	6 to 6½	..	not given		..	51	5 to 6	51	5 to 6	51	6 to 6½	40	6 to 6½	51	6	..	..	52	5 to 6	52	5 to 6	54	6	34-40	6	51	4 to 4½	38-40	4 to 4½	..	..	..	..	51	4½ to 5	38-40	4½ to 5
Staleybridge	54½	8	lt dk	8	54½	8	lt dk	8	54½	7½	47	7½	54½	8	lt dk	8	54½	8	lt dk	8	54½	8	lt dk	8	54½	7½	lt dk	7½	54½	4½ to 5	lt dk	4½ to 5	54½	5 to 5½	lt dk	5 to 5½	54½	4½ to 5	lt dk	4½ to 5
St. Andrew's	51	5½ to 6	42	5½ to 6	..	..	..	..	51	5½	42	5½	51	6	41	6	51	6	41	6	51	6	51	6	56	6	41	6	51	4½ to 5	42	..	..	..	..	..	51	..	41	4½ to 5
*Taunton	59½	4½ to 5½	59½	4½ to 5½	59½	4½ to 5½	59½	4½ to 5½	59½	4½ to 5½	59½	4½ to 5½	59½	4½ to 5½	59½	4½ to 5½	59½	4½ to 5½	59½	4½ to 5½	59½	5 to 6	59½	5 to 6	59½	4 to 5	59½	4 to 5	59½	4	59½	4	59½	3 to 4	59½	3 to 4	59	3 to 4	59½	3 to 4
West Bromwich	56½	8	51	8	54	7½	50½	7½	54	7	50½	7	54	7½	50½	7½	..	piece	wrk	..	54	7	50½	7	54	6	50½	6	56½	5	51	5	54	4½	50½	4½	51	4½	50½	4½
Wolverhampton	54	8	50½	8	54	7½	50½	7½	54½	7½	50½	7½	54	7½	50½	7½	..	piece	wrk	..	54	8	50½	8	54	7	50½	7	54	4½	50½	4½	54	4½	50½	4½	54	4¾	50½	4¾
Walsall	56½	8	50½	8	56½	7¼	50½	7¼	56½	7¼	50½	7¼	56½	7¼	50½	7¼	56½	7	50½	7	56½	8	50½	8	56½	6½	50½	6½	56½	6	56½	6	56½	4¾	50½	4¾	56½	5½	50½	5½
Wigan	54½	7¾	47	7¾	54½	8¼	47	8¼	54½	7¼	54½s 47b	7¼	54½	7¼	47	7¼	54½	7¼	47	7¼	54½	7¼	47	7¼	54½	7¼	47	7¼	54½	5 to 5½	47	5 to 5½	54½	5¾	47	5¾	54½	5 to 5½	47	5 to 5½
*Wakefield	49½	7¼	lt dk	7¼	49½	7¼	lt dk	7¼	49½	7	49½	7	50	7 to 9	50	7 to 9	56	7	40	7	50	7	50	7	52½	6½	52½	6½	49½	4¾	lt dk	4¾	49½	4¾	lt dk	4¾	50	4¾	50	4¾
*Whitehaven	54	7	54	7	..	not given		..	54	30/wk.	54	30/wk.	54	30/wk.	54	30/wk.	54	30/wk	54	30/wk	54	33/wk	54	33/wk	54	30/wk.	54	30/wk.	54	19/wk	54	19/wk	..	not given		.	54	19/wk.	54	19/wk
Winchester	58½	7	56	7	58½	5¾	55	5¾	58½	5¾	58½	5¾	58½	6½	55	6½	..	piece	wrk	..	58½	6½	58½	6½	58½	5	58½	5	58½	4	56	4	58½	3¼	55	3¼	58½	3½	55	3½
Warrington	55	8	50	8	55	8	50	8	55	7¼	50	7½	55	7¼	50	7¼	55	7½	50	7½	55	7½	..	..	55	7	..	..	55	5	50	5	55	5½	50	5½	55	24/wk.	50	22/wk
Worcester	54	7	48	7	54	7	50½	7	54	7	48	7	54	7	50½	7¼	..	piece	wrk	..	54	7	50½	7	54	6½	50½	6½	54	4	48	4	54	4	50½	4	54	4	50½	4
*Weston-super-Mare	56½	7	48	7	56½	7	48	7	56½	7	48	7	56½	7	48	7	56½	7	48	7	..	not given		..	56½	6½	48	6½	56½	4½ to 4¾	48	4½ to 4¾	56½	4½ to 4¾	48	4½ to 4¾	56½	4½ to 4¾	48	4½ to 4¾
*Widnes	55	8	47½	8	55	8	47½	8	55	7½	47½	8¼	55	8	47½	8	55	8	47½	8	55	8	47½	8	55	7	47½	7	55	4½	47½	4½	55	5½	47½	5½	55	5½	47½	5½
Weymouth	58½	6	50	6½	58½	5¾	50	6	58½	5½	58½	5½	58½	5½	50	6	58½	5½	50	6	58½	6	..	..	60	5½	50	..	58½	3¾	50	3¾	58½	3¾	50	3¾	58½	3¾	58½	3¾
*York	49½	7½	41	7¾	53	7	..	..	53	6½	53	6½	58½	6½	58½	6½	54	6½ to 7½	48	6½ to 7½	53	6½ to 7½	53	6½ to 7½	54	t 6½ c 7	45	t 6½ c 7	49½	4¾	41	4¾	53	4¾	47	4¾	58½	4½	58½	4½

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GLASGOW INSTITUTE OF ARCHITECTS.

The members of the Glasgow Institute of Architects held their annual excursion on the 3rd inst., the place of rendezvous being Dunfermline. Amongst those who availed themselves of the day's outing were Messrs. James Sellars, vice-president; John Baird, past-president; Campbell Douglas, past president; William Laiper, F.R.I.B.A.; Alexander Petrie, T. L. Watson, John M'Lean, William Forrest Salmon, F.R.I.B.A.; James Morris, A.R.I.B.A.; and William M'Lean, secretary. The party arrived in Dunfermline, having travelled by rail, at 11·45, and were met by Mr. G. Robertson, F.S.A., Scot., and Mr. A. Blair. They first visited the Abbey and Palace ruins, spending a good deal of time in the study of the details of the architecture. Some of the members of the party seemed to be much struck with the fine specimens of Anglo-Norman and Gothic architecture which are to be met with in connexion with the old Abbey Church. In the course of the day the excursionists drove to Pitfirrane, Broomhall (the seat of the Earl of Elgin), Rosyth Castle, and Inverkeithing. On returning to Dunfermline, the company dined in the City Arms Hotel.

THE SELECTED DESIGN FOR THE GLASGOW MUNICIPAL BUILDINGS.

Mr. W. Young, the author of the design bearing the motto "Viola," has been entrusted with the execution of these buildings, which are estimated to cost 250,000*l*. (Inclusive of internal furniture, decorations, &c. The *Scotsman* puts the total expenditure at 500,000*l*). The buildings, which are designed in the Renaissance style of architecture, will have frontages to George-square, George-street, John-street, and Cochrane-street. The principal elevation is towards George-square. The central portion forms the approach to the quadrangle, over which is the Council Chamber, emphasised by coupled Corinthian columns, backed by pilasters and surmounted by an upper order of columns, crowned by a pediment. This pediment has 60 ft. of frontage, and the apex rises 96 ft. above the street level, while on each side of it springs a belfry tower rising about 20 ft. higher. The entrance to the quadrangle is immediately below the Council Chamber, as is also the main staircase on each side leading to the floors above. In approaching the quadrangle there is a spacious loggia, having three wide archways. The central archway, intended for carriages, is 25 ft. in height, by 12 ft. in width. One on each side, 17 ft. high, in a corresponding style, forms an access to each of the principal staircases. Over the Council Chamber are the upper and saloon stories, which are lighted from the roof. The two under stories of this, as well as the other fronts, are mainly faced with rusticated stonework. In relief of this massive part of the structure are coupled Ionic columns and pilasters, between which the windows are placed. The grand tower rises, behind the central pediment, to a height of 190 ft., surmounting the apex of it by 96 ft. At the base, which is 35 ft. square, and for some 20 ft. above the apex of the pediment, the treatment of the tower is plain rustic masonry without openings. On the top of this there are two stages formed of Ionic pillars, above which runs a colonnade of pillars of the same character. The colonnade is about 14 ft. in diameter, and is capped by an elongated dome of stone. The central front projects about 7 ft. beyond the line of the building, and between it and the wings on either side is a recess forming a screen. At the wings, which, like the front, also project beyond the screen, are towers rising some 48 ft. above the front balustrade. The George-street façade has received nearly as much attention from the architect as the principal elevation. It may be mentioned that generally all round the block the third floor is architecturally emphasised. In this front the banqueting-hall is thus represented with a double row of massive Corinthian pillars, supporting a handsome entablature, surmounted by a balustrade. The wings here, as in the other fronts, are formed by a repetition of the tower front in George-square, and are similarly treated. In order still further to secure harmony of design, a screen is introduced between the wing towers and the centre. The leading feature of the John-street elevation is the Dean of Guild-court, which is placed in the third floor. On this side the design corresponds with that on George-square, but the details are of a much simpler character. Down this street are the gas and water offices, with handsome entrances. The centre is surmounted by a plain pediment, flanked with balustrades, along the whole length of the edifice. In the Cochrane-street façade the committee-rooms on the third floor are defined by a repetition of the Corinthian pillars rising over the basement story, and carrying entablature, cornice, and balustrade and turreted belfries at the ends. Piercing this front is a carriage-entrance, 22 ft. in height by 10 ft. in width. The elevations to George-square, George-street, and Cochrane-street, are enriched by groups of statuary. In George-square, including those in the tower, there are 27; in George-street, 24; and in Cochrane-street, 18; while John-street, being mainly occupied with business offices, receives a simple treatment which does not require their aid. The pediment in the central front at George-square bears emblematic groups in relief representing Britain and the Arts and Sciences. On the quadrangle fronts, which form an interesting feature of the building, great care has been bestowed. The general treatment is strictly in harmony with that of the street elevations,—an Ionic base surmounted by Corinthian pillars,—but the details are less ornate. In regard to the internal arrangements, two spacious staircases lead to the Council-chamber and the Banqueting-hall. The dimensions of the chamber are 65 ft. by 30 ft., with a recess in the centre, giving a width at that point of 40 ft. The windows are all on one side, but as there is a circular dome into the open air, there will be an abundant supply of light. In size the hall is 103 ft. by 54 ft., and it has a circular roof 50 ft. high, while connected with it are seven saloons for the reception of guests, &c. It may be mentioned that the roof-line of the building is 7 ft. higher than that of the General Post Office, and that the tower is 55 ft. higher than that of the Merchants' House, the two principle structures at present in the square.

GLASGOW MUNICIPAL BUILDINGS COMPETITION.

At a meeting of the Committee on New Municipal Buildings, Glasgow, held on the 27th of July, Mr. William Young, the author of the design marked "Viola," was introduced, and the town clerk reported that, under the remit made to him at the last meeting of the committee, he had met with Mr. Young, and had fully discussed the conditions under which his appointment as architect of the proposed municipal buildings should be made. After fully considering these conditions, it was unanimously agreed that Mr. Young should be appointed architect, subject to the following conditions:—

1. That he shall receive, in respect of his whole professional services and expenses as architect, a commission of five per cent. on the actual cost of the works executed from his designs and under his superintendence, but excluding from such costs salaries and allowances to clerks of works, measurers, and other outlays and payments which, by the practice of the profession, are excluded in fixing architects' commission, and that the amount of such commission shall be paid by instalments of the amounts after specified, viz.:—

For the first year	£3,500	0	0
For the second year	2,500	0	0
For the third year.....	2,000	0	0
For the fourth year	2,000	0	0
For the fifth year	2,000	0	0
	£12,000	0	0

the said payments to be made half-yearly at Martinmas and Whitsunday in each year till the work is completed,—which completion, it is assumed, will not extend beyond five years from the present date. On the work being completed, Mr. Young shall receive whatever balance may be due and payable to him at the time when the building is handed over to, and taken possession of by, the Corporation.

2. That, in addition to the commission above specified, he shall receive from the Corporation repayment of the railway fares paid by him in travelling between London and Glasgow in relation to the municipal buildings, but no further or other charges of any kind.

3. That he shall, with the approval of the magistrates and Council, appoint an efficient clerk of the works, whose salary shall be paid by the Corporation.

4. That he shall submit to the magistrates and Council the names of three measurers resident in Glasgow, and the Magistrates and Council shall select and appoint one of the three whose names are so submitted, to act as measurer of the said buildings, and the remuneration of such measurer shall be paid by the Magistrates and Council.

5. That the Magistrates and Council shall be at liberty, and power is hereby reserved to them, from time to time, to ask advice from the City Architect or any other architect or professional adviser on all points or matters on which the Corporation may desire to be advised, both as to the design and mode of execution of the work, and to represent to Mr. Young their views and wishes in regard thereto, and he shall, so far as practicable, give effect to such views and wishes.

6. In the event of any difference of opinion arising between the Magistrates and Council and Mr. Young, in regard to any matter connected with the proposed building, the same shall be referred, at the instance of either of the parties, to Mr. Charles Barry, architect, London, whom failing, to the President for the time being of the Royal Institute of British Architects, whose decision shall be final and conclusive, and shall not be subject to review by any court or other tribunal.

Mr. Young expressed himself satisfied with the arrangements above set forth, and it was agreed that the same should be reported to the Magistrates and Council, and, after being confirmed, should be officially communicated to and accepted by Mr. Young. The City Chamberlain was instructed to make payment, in terms of the seventh condition of the finacompetition, of 150*l*. to each of the ten comlpetitors. Mr. Young was informed that the Corporation are desirous of having the buildings proceeded with without delay, and the committee remitted to the City Chamberlain to warn away the tenants on the property at present on the site, and to Mr. Carrick to have the buildings taken down, and the materials disposed of as early as possible.

The Lord Provost, at a meeting of the Town Council on the 7th, in moving the adoption of the minutes, hoped it would go forth throughout the land that this competition was conducted on the most honourable principles. The minutes also showed with what carefulness the committee had proceeded to ascertain whether Mr. Young was altogether competent for the work to be performed, and he thought the Council would be satisfied they had the utmost reason to believe that Mr. Young was a gentleman into whose hands they could with perfect safety entrust these great buildings.

Mr. Martin said he thought the Town Council should keep the appointment of measurers in its own hands. It was not to be supposed that a stranger, comparatively speaking, should have a thorough knowledge of the measurers of Glasgow.

The Lord Provost thought it right to say that Mr. Barry and Mr. Young met for the first time in London. They had never seen each other before. Mr. Barry had heard of Mr. Young by name, but he had never seen him. The same remark held good with regard to Mr. Carrick.

The minutes were approved.

The Technological, Industrial, and Sanitary Museum of New South Wales.—The Colonial Government are making rapid progress with the organisation of this museum, which has now been permanently established in the Garden Palace at Sydney, the building in which the International Exhibition of 1879 was held. Arrangements are now being made for the shipment of contributions to the museum from manufacturers in this country, which, for the most part, consist of sanitary appliances and articles connected with building. These contributions are being forwarded to Sydney free of cost by the Government, on the recommendation of the British Committee. This committee have issued a circular, in which they say that "large numbers of houses are being erected in the city of Sydney and other cities and towns of the colony,—in one suburb alone six hundred houses having been built last year. The authorities are paying great attention to sanitary matters, and the principal object of the Government in establishing and maintaining the Museum is to provide a means whereby the Colonists may become acquainted with improved apparatus and appliances for building and domestic purposes." Manufacturers and others wishing to avail themselves of the opportunity of sending specimens, models, plans, books, illustrated catalogues, &c., should apply to Mr. Mark H. Judge, 8, Park Place-villas, Paddington, the acting member of the British Committee, for necessary forms.

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OBITUARY.

Mr. Edward L. Paraire, Architect.—We have to record the death of this gentleman, which took place at the age of 56, on the 1st inst., at 38, Mornington-crescent. Mr. Paraire was of a French family, but was naturalised in this country. His name was last before the public in connexion with an action he brought against the owners of the plot of land in Leicester-square, afterwards occupied by a panorama, the particulars of which we gave at the time. For some years he was in partnership with Mr. Finch Hill, during which period the firm executed a number of buildings, including the Britannia Theatre, the Holborn Theatre (the Duke's), the Philharmonic (Islington), the Oxford Music-hall, the Royal Cambridge Music-hall; the Presbyterian Church, Camden Park-road; the Baptist Chapel, City-road; the Club-room, Lord's Cricket Ground; Royal Oak, Bayswater, and many other taverns. Since the termination of the partnership he had prepared designs for the London and County Bank about to be erected at the corner of New Oxford-street, not yet commenced. The "Horseshoe," Tottenham-court-road, is also one of his works.

THE METROPOLITAN BOARD OF WORKS AND LONDON THEATRES.

The Metropolitan Board of Works have been successful in the first case in which they have put in force the powers conferred upon them by the Metropolis Management and Building Act (Amendment) 1878. This was with regard to the Lyceum Theatre, upon the owner of which the Board served notice requiring him to make certain alterations. The owner appealed, and the question then went to arbitration, Sir Henry A. Hunt, C.B., being the arbitrator appointed by the Home Secretary. After hearing the evidence on both sides, and making two inspections of the theatre, the arbitrator recently made an award by which he confirmed the principal requisitions made by the Board. The most important of these requisitions are the entire reconstruction of the gallery staircase in Exeter-street, which is very defective in some particulars, the carrying up of the proscenium-wall above the proscenium opening and through the roof, and the separation of the carpenter's shop above the auditorium from the audience by fire-resisting materials. The Lyceum Theatre was built in 1834 by Mr. Samuel Peto, from the designs of the late Mr. Samuel Beazley, and possesses advantages, as regards position, which are enjoyed by but few of the London theatres. The works required by the Board will be put in hand at once, and will, it is expected, be completed before the re-opening in the beginning of October next.

Arbitration cases are also pending with regard to Drury Lane Theatre and the Royal Music Hall, Holborn, Sir H. A. Hunt being in both cases the arbitrator appointed by the Home Secretary. Notices have also, we understand, been served by the Board upon the owners of the Gaiety Theatre, the Vaudeville Theatre, the Opera Comique, and the Court Theatre, but it is not expected that in these cases the parties will proceed to arbitration, but the alterations will be carried out by the owners in the terms of the notice.

LICENCES TO OPERATIVE PLUMBERS.

At a meeting of the Birmingham Town Council held on the 1st inst., Alderman Cook presented a memorial from the master-builders against the scheme for the insurance of water-fittings. It stated that though they fully appreciated the efforts the Water Committee were making to prevent the present waste in the town, they were unanimously of opinion that this might be accomplished by an efficient system of inspection without the control of the fittings and repairs being taken by the committee into their own hands, to the detriment of the builders and plumbers of the town. The memorial was received. Mr. T. Martineau then presented the report of the Water Committee, and moved that the regulations for the laying on of water, the execution of repairs and fittings, and the schedule of prices, should be approved, subject to such alterations in detail as the committee might feel desirable to make. One of the most important points they had had to consider was as to the persons who were to become licensed plumbers, and a question had arisen as to the expediency of giving licences to operative plumbers. The committee had thought it right to do so, and they had reason to believe it would give satisfaction to the workmen. It was objected to by the master plumbers, on the ground that the committee would be placing the men on the same footing as the masters, and that this would create a difficulty. That objection, he thought, was based on a misapprehension of the intentions of the committee, and to correct it they issued a second circular, in which they stated plainly that they did not want to make a rule that the master plumbers must employ licensed workmen, but only that builders and decorators should do so. The master plumbers were supposed to know their trade, and might execute their work by any workmen they liked; but with regard to people such as decorators and builders the case was different. It was with those men that the causes of complaint had arisen, because they had employed inefficient men, such as gas-fitters and tinkers, and it was thought desirable to make it compulsory that they should employ licensed workmen. Alderman Cook proposed that the following be added to the resolution, "And taking into consideration that the principle of insurance of fittings is an experiment, the Water Committee be requested to limit any agreement in relation thereto to a period of not more than two years, in order that the Council may obtain experience of the working of the principle before committing themselves finally to the scheme; and further, that the committee be requested to confer with the plumbers and builders in order to carry the scheme into effect with the least possible interference with private trade." Mr. Martineau accepted this amendment as a rider to the resolution of the committee, which was adopted by a large majority.

CHEESE-ROOM ROOF.

Sir,—What is found to be the lightest, *coolest*, most durable, and cheapest covering for cheese-room roofs outside and inside? I have a very old thatched roof, but with oak timbers, and think some sort of tiles will be best. Although not so cool as thatch, old oak rafters are bad for nailing either battens or laths. I want it as light as possible. Old Roof.

*** We printed some letters on the subject of light roofs not long ago.

ST. PANCRAS WORKHOUSE COMPETITION.

Sir,—With reference to your announcement as to the above competition, permit us to state that Mr. Cates, the referee, did *not* report that the gentlemen named were the only ones who had complied with the requirements of the Local Government Board.

Wilson, Son, & Aldwinckle.

PROVINCIAL NEWS.

Carlisle.—The Carlisle and Cumberland Banking Company (Limited) are making extensive alterations to the bank premises in Devonshire-street, formerly occupied by Messrs. Mackie, Davidson, & Co. The ground-floor is being transformed into shops, and the upper floors into suites of offices, caretaker's rooms, &c. The contract for the whole of the works is in the hands of Mr. Thomas Milburn. Mr. George D. Oliver, of Carlisle and Workington, is the architect.——The drill-shed of the 1st C. R. Volunteers is to have a new roof. The old wooden one (being in a dangerous condition) is to be replaced by an iron one. The height of the building is also being increased, and other improvements are in progress. The tender of Messrs. Pratchitt Bros., of Carlisle, has been accepted for the ironwork, and that of Messrs. W. & H. Davidson for the rest of the works. Mr. Geo. Dale Oliver is the architect.

Driffield.—A special meeting of the Local Board was held on the 24th ult. for the purpose of considering a minute from the Waterworks Committee, recommending the adoption of certain plans and specifications for the construction of waterworks, prepared by Mr. Bruce, C.E., of Hull. The works are estimated to cost 5,000*l*. Mr. W. O. Jarratt proposed the adoption of the minute, which was seconded by Mr. White. Mr. Forster proposed as an amendment that the opinion of the parish should be taken on the matter before the works were further proceeded with, but after a long and warm debate, the original motion for the construction of the works was carried, the voting being 7 to 4.

Warrington.—At a meeting of the Warrington Town Council, on the 1st inst., Alderman Davies made a speech in favour of the Manchester tidal navigation scheme, and moved,—"That this Council views with satisfaction the promotion of an improved tidal navigation of the river Mersey up to Manchester, and that support be given to the scheme, feeling that any such improvement will be conducive to the interests of the town and trade of Warrington, and be the best means of enabling the Corporation to prevent the floods to which the lower parts of the borough are subject." Alderman Keen seconded the proposition, which was warmly received and carried unanimously. A petition on the subject to the Board of Trade was also adopted.

Bristol.—The new Bedminster Police-station was formally opened on the 24th ult. The buildings have been erected from plans prepared by Mr. H. Crisp, architect, Bristol. The premises occupy the site of the old station on the Causeway, and cover an extensive area, having a frontage of 108 ft. to the street, and extending backwards 150 ft. to New Charlotte-street. The buildings, which are constructed of Pennant stone, with freestone dressings, form three sides of a rectangle. The structure is in the castellated style, and a prominent feature in the design is a central square tower, rising to the height of 50 ft. above the ground. In the tower is placed a large illuminated clock, the gift of Mr. E. S. Robinson. The ground-floor of the northern wing of the building is devoted to the charge room, and this apartment, like all the others in the edifice, is floored with quartz-finished concrete, laid down by Messrs. Homan & Rogers, of Manchester and London. The cells are seven in number, and each is 12 ft. long, 12 ft. high, and 6 ft. wide, and is floored with Claridge's asphalte. The walls are lined with white glazed bricks (supplied by the Farnley Iron Company, Leeds). The locks and fittings of the doors are of extra strength, and have been furnished by Messrs. Murrell, of London. The cells are warmed by Haden's (Trowbridge) heating apparatus. The general contractor was Mr. Wm. Veals, Upper Maudlin-street.

Weston-super-Mare.—The second wing of the West of England Sanatorium, at Weston-super-Mare, which has just been completed, has been erected by Mr. A. J. Beaven, of Bedminster, Bristol, from the designs and under the superintendence of Messrs. Price & Wooler, architects, Weston-super-Mare. The building stands in three acres of ground, at the back of which are the sands, forming excellent bathing-ground for the patients. The section which was opened about ten years since consists of the quarters for women and children, and offers accommodation for fifty patients, and the central part, which includes the main entrance. The part now completed is built upon exactly the same plan as the first section, and will be for men, it offering accommodation for fifty more patients, making 100 in all. The building, which is Collegiate in style, forms a quadrangle. In the entrance-hall is a carved open screen, erected to the memory of the late Miss Hicks, of Bath. Over the screen is a gallery which leads from the men's to the women's block. On either side of the doorway is a stained-glass window, by Mr. Bell, of College-green, Bristol,—one representing "Faith" and the other "Hope," the former the gift of Mrs. Birkett and the latter that of Mrs. John Harvey. The passages are laid with Maw's tiles. Adjoining the kitchen is a drying-room, with furnaces, and a hot-water supply for use in baths, which are provided for every patient, in both sections of the building. The upper story is reached by means of a substantial stone staircase, lighted by a window, the design also of Mr. Bell, and filled with cathedral glass. Attached to the Sanatorium, on the southern end, is a chapel in the Early English style, which will seat 120 persons, including the accommodation in the gallery. At the west end are nine stained-glass windows, executed by Mr. Gibbs, of London, a stone pulpit, and also a fine organ. The chapel, it should be added, was built some years since. The heating of the building was carried out by Messrs. Jones & Hudson, of Redcliff-street, Bristol.

Brighton.—At a meeting of the Brighton Sewers Board on the 1st inst., a report was read from the Surveyor (Mr. P. C. Lockwood) embodying some suggestions made by Sir J.

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Bazalgette, with reference to the intercepting sewer, in his report as to the state of the Brighton sewers generally. The Committee resolved, "That the Surveyor to the Board do prepare plans and an estimate of the cost of constructing an outfall for storm-water at Roedean, as suggested by Sir Joseph Bazalgette." They also decided to call the attention of the Hove Commissioners to the recommendations of Sir Joseph Bazalgette, and requested them to cause catchpits of sufficient size to intercept the road detritus, to be formed under the street-gullies in Hove. The Board adopted the recommendations of the Committee.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Bath.—On the 6th ult. the new church at the Roman Catholic College, Prior Park, was opened. It was the intention of a former Roman Catholic Bishop of Clifton (Dr. Baines) to build a church for the college (of which he was the founder), and he made considerable preparations to that end. It was left, however, to his successor, Bishop Baggs, to lay the foundation stone in 1844. The walls had been carried about half-way up to the roof when the events which led to the closing of the college in 1856 necessarily stopped the building of the church. The college was re-established by Bishop Clifford in 1867, under the presidency of the Rev. Dr. Williams, and in 1871 the building of the church was resumed and carried on to its present stage. It is not yet finished, but it is in such a state as to allow of its opening. The church stands between the two colleges of SS. Peter and Paul, and harmonises very well with the familiar elevation of Prior Park. It is, of course, constructed of Bath stone. The church is regarded as the most perfect model of a Roman basilica existing in England. On the north and south sides the basement of the church is formed of an arcade of eleven arches, above which rises one order of the Corinthian style of architecture, between which are the windows lighting the aisles. Above these is a series of panels which are to be filled with scenes from the lives of SS. Peter and Paul. The porches are at the western ends of the north and south arcades, and upon these will eventually rise two towers, which have at present been carried as high as the belfry floor. The south porch is the public entrance, the north one giving access to St. Paul's College and to the park, and will be used on occasions of processions. The massive doors are of oak, very handsomely carved and panelled. The east end of the building terminates in a semi-circular apse surmounted by a fine dome. Passing to the interior, the nave is separated from the aisles by a range of Corinthian columns raised on pedestals, seven on each side; above these rises the grand cornice, with but a single break on either side, and the nave is covered in with a richly-panelled semicircular ceiling, the windows lighting the nave being groined into it. Between the pilasters on the walls of the aisles, corresponding with the columns, are arches, blank on the south side, but opening to chapels on the north. The apse is semicircular, having three-quarter columns round it, and lighted by a lantern in the dome. Overlooking the chancel are two tribunes over the side entrances. As is usual in churches of the basilica form, the seat for the clergy, which is of oak with carved stall-ends, runs around the apse, the high altar standing detached. The aisles are narrow and raised above the general nave floor, and are intended only for processions or as passages to the various chapels. The north aisle terminates at the east end, in the chapel of the Blessed Sacrament. The south aisle leads to the sacristy, octagonal in form, and lighted by a lantern. The organ-loft, which has yet to be built, will be at the west end of the nave. The total length of the church is 120 ft., that of the chancel being 43 ft.; the breadth of the nave is 27 ft. 6 in. in the clear of the columns, and the height 45 ft. The altar is composed of very rich Italian marbles, the sepulchre for the relics being seen through a beautiful pierced cross of statuary marble. It was made in Rome for the church, and rests upon three steps, also of marble. Only two of the chapels on the north side are as yet ready for their furniture. The first of these, occupying three bays, is dedicated to St. John the Evangelist, and is being finished as a memorial to the late Rev. Dr. Bonomi, Vicar-General of the Diocese. In the recess at the back of the altar is to be fixed a mosaic by Salviati, representing St. John. The next chapel is of one bay, and is dedicated to St. Joseph, and has been finished as a memorial to the late J. J. Scoles, the original designer of the church (who will be remembered by some of our readers as a practising architect), by his son, the Rev. A. J. Scoles, who has completed his father's work. Mr. Bladwell has been the contractor for the whole of the work, except the ceiling, which was entrusted to Mr. P. J. McManus, of London.

STAINED GLASS.

St. John's Wood.—The east window of the chancel of St. Stephen the Martyr, Avenue-road, has just been filled with stained glass. The artist, Mr. W. G. Bailey, has treated the five lights with white Perpendicular glass, which relieves the subjects. The Adoration of the Magi and the Shepherds fill the centre three lights, and the two remaining outer lights contain each two subjects, namely, the Annunciation, and the Child Jesus in the Temple, and the Agony in the Garden, and the Three Maries at the Holy Sepulchre. In the tracery above the five lights are St. Stephen the Martyr, patron of the church; St. John the Baptist, patron of the district; and St. Paul the Apostle, patron of the See of London. At the foot of the window is the legend,—"To the glory of God, and in memory of Alfred Swaine Taylor, M.D., F.R.S., and Caroline, his wife. This window is erected by their daughter and son-in-law, Edith and Frederic Methold, A.D. 1882. The effect, during some parts of the day, will be materially improved when the west window of the nave is also filled with stained glass, as the full glare of light through it now detracts from the effect of the new work.

Devynock.—A four-light window, representing the Nativity, Presentation, Crucifixion, and Ascension of Our Lord, has just been erected in the parish church of Devynock, near Brecon, in memory of the Rev. David Parry, late vicar of the parish. The work is from the studios of Messrs. Mayer & Co.

Miscellanea.

The Welding of Cast Steel.—On the 2nd inst. a committee of the Royal Scottish Society of Arts, Edinburgh, accompanied by several of the members, visited St. Margaret's Works to witness the welding of cast steel by the process recently described to the Society by Mr. Benjamin Askew, and of which we have already made mention. The welding is done by means of powdered stucco used just as smiths are accustomed to use sand in other weldings. Four pieces of cast-steel scraps from two different makers were welded into one square bar, which was afterwards broken. The fracture showed no mark of the joining, but the grain of the two qualities of steel could be distinguished. Two old files were welded together and hammered into the shape of a chisel, which was hardened, tempered, and sharpened, and then used to cut an inch bar of iron. The process is so simple that any skilled smith may practise it; he must use heat enough to flux the stucco, but not so much as to fuse the steel.

Turner Drawings and Sketches at Glasgow.—A new series of sketches and water-colour drawings, selected from the Turner Collection in the National Gallery to replace the set recently withdrawn, has just been lent to the Parks' Committee by the trustees of the National Gallery, and are now on view in the Corporation Galleries, Glasgow. A short time ago a portfolio of facsimile reproductions of early Italian engravings was presented to the Galleries by the trustees of the British Museum. These have now been framed and exposed in one of the upper galleries.

Wick Harbour.—A deputation from the Pulteney Harbour Board have been in London arranging with the Treasury officials for a loan to carry out the new works for the extension and improvement of Wick harbour in accordance with plans prepared by Mr. Barron, C.E. They have been successful in their mission. The Government has arranged to lend 30,000*l.* for starting the new works, reserving consideration of further advances till the results of the expenditure of that sum are seen.

Featherstone.—On the 18th ult. the Archbishop of York re-opened the ancient and interesting Church of All Saints, at North Featherstone (now so-called), near Pontefract, which has been closed for about two years, while undergoing restoration. Messrs. Healey, architects, of Bradford, took the restoration in hand, and with the aid of Messrs. Smith & Freeman, of South Featherstone, builders, have brought the work to a successful completion. Christ Church, Oxford, is the lay rector, and this wealthy society gives 300*l.* to the work of restoration. The south portion has been entirely rebuilt, and the tower, which contains three bells, partially restored. The font, which is supposed to have been brought from Pontefract during the time of the Civil Wars, bears a curious inscription, and also the name and coat of arms of John de Baghill. During the work some very interesting discoveries came to light. The roof, which before permitted the rain to come through, has been replaced by an open one of oak, and the walls have been cleansed and repaired.

Presentation to Mr. E. Melville Richards, C.B., late Borough Surveyor.—On Thursday last a deputation of magistrates and councillors waited upon the above-named gentleman at his private residence and presented him with an address handsomely illuminated and engrossed on vellum, expressive of their high appreciation of his past valuable services as their borough surveyor. The address is signed by upwards of 300 magistrates, councillors, and influential ratepayers of Leamington.

London and Middlesex Archæological Society.—The annual excursion of this Society will take place on Thursday, August 17th, to Silchester, where members and friends will assemble at two p.m. Mr. J. G. Hilton Price, F.S.A., will explain the famous antiquities of the place, and others are expected to assist. The South-Western Railway has kindly consented to issue return tickets from Waterloo to Basingstoke at a reduced rate.

The War Office have instructed Messrs. Clark, Bunnett, & Co., Limited, of Rathbone-place, to supply several iron buildings for stores for shipment to Egypt. The *employés* of this company had their annual dinner on Saturday last, the London men going to Teddington, and the men at the Paris Works going to Montmorency, near Paris, and the New York *employés* to Manhattan Beach.

New Steelworks at Workington.—At Workington, on the 4th inst., Mr. R. H. Hodgson, contractor, of Workington, received the contract for the erection of the new steel works for Messrs. Cammell & Co., of Sheffield, which are to be added to the present Derwent Ironworks at Workington. It is expected that a start will be made next week. The contract will amount to close on 50,000*l.*

Working Men's Exhibition.—A Working Men's Exhibition is to be opened by the Lord Mayor, on Saturday, September 23rd next, at Brunswick House, Vauxhall. The applications for space are numerous, and intending competitors should at once apply, enclosing stamped envelope for rules, to the secretary, Mr. E. E. Smith, at Brunswick House, Vauxhall.

Bristol.—At a meeting of the Town Council on the 8th inst., Mr. Thos. Howard, M. Inst. C.E., announced his intention of shortly resigning his appointment of Engineer to the Bristol Docks, and Mr. J. W. Girdlestone, Assoc. Inst. C.E., was appointed as his successor. Mr. Howard will still be retained as consulting engineer.

Liverpool.—The *Liverpool Daily Post* announces that Lord Sefton has given a site in Ullett-road, between Sefton Park and the Cemetery, for the church which is about to be built in memory of the late Mr. Robert Horsfall. Mr. J. L. Pearson, R.A., has been instructed to prepare plans for the memorial church.

New Bakery at Wanstead.—Mr. H. W. Nevill has commenced the erection of a new bakery at Harrow-road, Wanstead Flats. The architect is Mr. W. T. Farthing, and the builder Mr. J. Woodward, of Wilson-street, Finsbury.

Valuations.—Mr. Wm. Eve, of Union-court, Old Broad-street, who has recently completed the valuation of Alton Union, has been instructed to re-assess the whole of the property in the Reading Union.

The Wagon Lifts at the extensive works of the Great Eastern Railway Company, at Shoreditch, and which has been specially noticed, was constructed and put up by Messrs. Lewis & Lewis, of Cambridge Heath-road.

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Technical Education.—The Coach and Coach-harness Makers' Company, in continuation of their action in former years, offer for 1883 a number of prizes for competition among persons engaged in the trade of coachmaking, whether clerks, foremen, workmen, or apprentices. Each of the prizes will be accompanied with the certificate of the company. The following is a list of the prizes offered:—For freehand drawings of foliage or ornaments from Nature, or models in ink or crayon, in outline (not shaded): 1st prize (among former prize-winners and others, no limit as to age), the Company's silver medal and 4*l.*; 2nd prize (excluding former prize-winners, no limit as to age), the Company's bronze medal and 3*l.*; 3rd prize (for apprentices and others under twenty-one years of age), the Company's bronze medal and 2*l.*; separate prizes for sons of British coachmakers being educated and trained as master coachbuilders, a silver-gilt medal. For working drawings of one-horse wagonette: 1st prize (for apprentices and others under twenty-one years of age), the Company's silver medal and 3*l.*; 2nd prize (for apprentices and others under twenty-one years of age), the Company's bronze medal and 2*l.*; separate prizes for sons of British coachmakers being educated and trained as master coachbuilders, a silver-gilt medal. For full-sized working drawings on paper of a gentleman's phæton, mail or spider shape: 1st prize, the Company's silver medal and 15*l.*; 2nd prize, the Company's bronze medal and 10*l.*; 3rd prize, the Company's bronze medal and 5*l.*; separate prize for sons of British coachmakers being educated and trained as master coachbuilders, a silver-gilt medal.—*City Press.*

Milner's Safe Company. — The eighth annual meeting of this company took place last week, at the Cannon-street Hotel, Mr. C. T. Ritchie, M.P. (chairman), presiding. A report was presented stating that the net profit, after making all proper deductions, was 22,157*l.* 11s. 4d., from which must be deducted interest on debentures, 1,739*l.*, leaving 20,418*l.* 11s. 4d. The directors proposed to declare a dividend of ten per cent. per annum, which, with 3,500*l.* paid by way of interim dividend, would absorb 14,000*l.*, leaving a balance to be carried to the reserve fund of 6,418*l.* 11s. 4d. It was proposed to transfer in further liquidation of the good-will account, 2,000*l.* from the reserve fund, which would then stand at 10,339*l.* 10s. 7d. The debenture loan had been, since the last general meeting, reduced by a further sum of 1,500*l.* at the third annual drawing, under the debenture trust deed, leaving the debenture loan at 41,700*l.*, of which the company held 10,000*l.*, reducing the amount practically to 31,700*l.* The directors had considered it in the interest of the shareholders to recommend the payment of a dividend of ten per cent. per annum, rather than a larger dividend, which the earnings of the company would justify. Sir H. B. Loch, K.C.B., seconded, and the report was adopted unanimously.

The Sewerage of Brighton.—The *Lancet* of this week publishes the report of Mr. Bailey-Denton on the sewerage system of Brighton, with special reference to the ventilation of the sewers. This exposition of facts given by him will, he trusts, "serve to show that no amount of money expended in palliations such as those recommended by Sir Joseph Bazalgette will render the sewerage of Brighton what it ought to be. As a health resort Brighton is often frequented by invalids, who are specially sensitive of bad smells; and unless the sewers have a constant discharge, associated with a perfect system of sewer ventilation, the present evils will be maintained." Mr. Bailey-Denton concludes his report, after stating that ventilation can be readily effected at a moderate outlay, by saying that so long as Brighton remains with a tide-locked sewer extending along the whole length of its frontage to receive surface-waters as well as sewage, without making an effort to prevent their detention, there will be cause for the strictures made by the *Lancet* on the sewerage of Brighton.

Decoration of Glass without Heat.—Ernest Dumas has presented a favourable report upon the decoration of glass by the method of M. Lutz-Knechtle, of Frogen, Switzerland. He adds zinc white or ultramarine to a solution of silicate of soda or of potash, so as to produce colours which can be applied to the glass in various ways. These colours dry very quickly, and will bear hard washing.—*Chron. Indust.*

Sewerage Works at Shepton Mallet.—The *Shepton Mallet Journal* of the 4th inst. contains a report of what took place at the last meeting of the local Board of Health. Included in the minutes of the Sewerage Committee was the following passage:—

"The question of the use of clay *versus* cement was discussed at a committee meeting on the 20th of July, when Mr. Catley stated that the contract provided that cement should be used in jointing the pipes, but that he had power as engineer to alter the material, and that at certain places where pipes had been laid through water, there clay in his opinion was preferable, and in a few joints of the sort he had authorised the contractor to use clay instead of cement."

On this head, however, Mr. Spire, the clerk of works, in a report made to the Board on the progress of the works, says:—

The branch line at West Shepton from the manhole by Mr. John H. Pullen's garden-doors to the road opposite Mr. E. H. Stone's Farmhouse, not being satisfactory, has been re-opened, when it was found that three powerful springs of water had opened in the trench and burst the joints of some of the pipes. This water has now been carried down the trench by means of extra pipes placed at a lower depth, the sewage pipes have been carefully relaid principally in cement, and well puddled with clay, and I am of opinion this line of pipes will now be found properly watertight.

Public Offices Site Act.—On Saturday last was issued the "Public Offices Site Act." Its execution will effect some considerable alterations in Spring-gardens and Charing-cross in connexion with the erection of the new buildings for the Admiralty and War Departments, and will involve the removal of St. Matthew's Chapel, Spring-gardens. The schedules annexed to the Act show the number of houses to be purchased in Spring-gardens, Whiteball, and Charing-cross. The Commissioners of Public Works are empowered to acquire the land specified for the new public offices. The Commissioners of Woods may, with the approval of the Treasury, provide out of the land revenues of the Crown a new Office of Land Revenue Records in lieu of the existing office. The passage and right of way at Spring-gardens will be closed.

Compensation Case. — A compensation claim, at the instance of the trustees of the parish estate of St. John the Baptist upon Walbrook, against the Metropolitan and Metropolitan District Railways, was heard at the Guildhall, before the Recorder and a special jury, the property of the claimant being required for the completion of the Inner Circle scheme. The claimant was Mr. H. Mathews, architect and surveyor, Cloak-lane, Cannon-street, who had an unexpired term of nine years of his lease to run, and who claimed 2,906*l.* as compensation from the companies for the compulsory surrender of his rights. Skilled witnesses were called for the companies, who valued the property at from 2,293*l.* to 2,314*l.* In the result the jury awarded the sum claimed, 2,906*l.*

The Temple and the New Law Courts.—The Strand Board of Works have received a communication from the Benchers of the Middle Temple, asking permission to construct a subway from the Middle Temple to the New Law Courts. The Board granted the application on condition that the public should have the use of the subway, and that it shall be closed at a definite hour at night, so that it shall not be a refuge for bad characters.

Etchings of Old Southwark. — Messrs. Nichols & Co. have arranged with Mr. Percy Thomas to make an etching of the old White Hart Inn Yard, Southwark. This inn dates back for some five centuries, is often mentioned by Shakespeare, was the head-quarters, in 1450, of Jack Cade, and in our own times has been described by Charles Dickens as a scene in Pickwick.

Haworth.—There has lately been placed in the floor of the chancel of the new parish church a brass, designed and executed by Messrs. Hart, Son, Peard, & Co., in memory of Charlotte Brönté, the eminent authoress, who for many years resided at the vicarage, and where her works for the most part were written.

TENDERS

For repairs, &c, at Chestnuts, Crouch-end, for Mr. Hicks. Mr. J. Farrer, architect:—

	Repairs, &c.	New Porch.
Southcott	£158 0 0	—
Oldis	114 0 0	£83 0 0
J. S. King (accepted)	127 0 0	39 0 0

For storm-relief sewer works in Clapham, Battersea, Wandsworth, and Putney, for the Metropolitan Board of Works. Sir J. Bazalgette, engineer:—

Munday & Sons	£245,000 0 0
W. Webster	240,300 0 0
Gill Bros.	199,000 0 0
Bull & Sons	185,000 0 0
Cook	182,000 0 0
Mears	180,000 0 0
J. Pizzey	177,750 0 0
Walker	175,650 0 0
Foote & Co.	175,000 0 0
Nowell & Robson	169,850 0 0
Mowlem & Co.	169,000 0 0
Kellett & Bentley	161,079 2 4
Pearson & Co.	160,500 0 0
Nelson & Co.	159,790 0 0
Lovatt	155,500 0 0
Macrae & Macfarlane	155,121 0 0
Williams, Son, & Wallington	154,700 0 0
W. Waddle (accepted)	151,995 19 0

For superstructure of new building, 11, Abchurch-lane, King William-street (contract No. 2), for the London and Provincial Fire Insurance Company (Limited). Messrs Davis & Emanuel, 2, Finsbury-circus, architects. Quantities by Mr. F. Downing, 7a, Whitehall-yard:—

Foster & Dicksee, Rugby	£8,988 0 0
Ashby & Horner	8,592 0 0
David King & Sons	8,500 0 0
Colls & Sons	8,476 0 0
John Mowlem & Co.	8,393 0 0
Kirk & Randall	8,359 0 0
Lucas Bros.	8,324 0 0
G. Trollope & Sons	8,183 0 0
John Grover	8,163 0 0

For extension of nave and aisles, erection of chancel, vestry, organ-chamber, chancel-aisle, restoring the interior, and new seating, for Narborough Church, Leicester. Mr. F. Bacon, Newbury, architect. Quantities by Mr. W. Clifton, Stoneygate, Leicester:—

Fox Bros.	£3,728 10 0
Fast	3,665 0 0
Black	3,572 0 0
Foster & Dicksee	3,292 0 0
Harrolds	3,261 14 0
Herbert	3,242 0 0
Roberts & Son	3,240 0 0
Law & King	3,190 0 0
Thrall & Payne	2,982 0 0
Stirk	2,947 12 8
Langton & Son (accepted)	2,904 3 0

For house at West End-lane, Kilburn, for Mr. Lewis Spain. Mr. Henry John Hansom, architect. Quantities by Mr. Henry Smith:—

B. Cooke & Co.	£2,800 0 0
J. Grover	2,755 0 0
J. Hobson	2,735 0 0
J. Gregory	2,690 0 0
B. E. Nightingale	2,643 0 0
Lathey Bros.	2,630 0 0
W. Smith	2,552 0 0
Richens & Mount	2,532 0 0
Stimpson & Co.	2,459 0 0
Turtle & Appleton	2,430 0 0
Dainton	2,295 0 0

For alterations at No. 136, Richmond-road, Dalston, for Dr. Brewer. Mr. Benjamin Tabberer, architect:—

Norris	£1,730 0 0!
Conder	1,390 0 0
Taylor & Parfitt	1,139 0 0
Steel Bros.	1,120 0 0
Shurmur	1,089 0 0
Ashton	935 0 0!

For alterations to White's Club-house, No. 37, St. James's-street, Piccadilly, for Mr. Percival. Mr. Thos. Milbourn, architect:—

Sprake & Foreman	£2,154 0 0
Ashby Bros.	2,071 0 0
W. H. Salmon	2,035 0 0
R. Conder	1,780 0 0
Taylor & Parfitt	1,758 0 0
W. & E. Curtis	1,748 0 0

For the erection of a house in Barrowgate-road, Chiswick, for Mr. F. J. Alexander. Mr. J. Coverdale Bilton, 2, Avenue Market-terrace, Turnham-green, architect:—

Schofield & Co., London	£1,600 0 0
H. J. Whitman, Chiswick (accepted)	1,120 0 0
W. Blackburn, Chiswick	1,107 0 0

For completion of houses in Milton-road, Harrow-on-Hill. Mr. J. H. Taylor, architect:—

Pleece (accepted)	£252 10 0

For formation of roads, sewers, and filtering-tanks at Neasden, for Mr. R. Richards. Mr. J. H. Taylor, surveyor:—

Mears	£1,200 0 0
Nowell & Robson	1,073 0 0
Beadle Bros.	1,062 0 0
Killingback	945 0 0
Felton	929 0 0
Neave & Son (accepted)	925 0 0

For alterations and additions to Nos. 4 and 5, Manchester-terrace, Kensal-town. Mr. J. H. Taylor, architect:—

Handover	£175 0 0
Ward	139 0 0
Painter (accepted)	130 0 0

For completion of Nos. 5 and 6, James-terrace, Kensal-road. Mr. J. H. Taylor, architect:—

Ward	£425 0 0
Lamble	395 0 0
Hook	312 0 0
Handover	295 0 0
Sanders (accepted)	287 0 0

For repairs to the Falcon, Kilburn-lane. Mr. J. H. Taylor, architect:—

Waymouth	£167 0 0
Lamble	150 0 0
Wells	140 0 0
Fairthorne & Impey	136 10 0
Handover	135 0 0
Spurgeon (accepted)	124 0 0

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For the erection of business premises and residential chambers, Old Brompton-road, for Mr. W. Glover. Mr. William H. Collbran, 94, Gloucester-road, South Kensington, architect. Quantities by Messrs. Strudwick & Mennie:—

	General Work.	Hot-water Services
E. Braid	£6,270 0 0	£160 0 0
McLachlan	6,190 0 0	145 0 0
H. Toten & Sons	6,300 0 0	135 0 0
Kirk & Randall	6,231 0 0	179 0 0
Colls & Sons	6,187 0 0	182 0 0
Martin, Wells, & Co.	6,200 0 0	110 0 0
B. E. Nightingale	6,070 0 0	178 0 0
Thomas Boyce	6,050 0 0	150 0 0
Higgs & Hill	5,940 0 0	134 0 0
Ashby Bros.	5,957 0 0	168 0 0
G. H. & A. Bywaters	5,879 0 0	167 0 0
Perry & Co.	5,698 0 0	120 0 0
Robert Smith	4,845 0 0	70 0 0

For the erection of business premises and residential chambers, Old Brompton-road, for Mr. R. King. Mr. William H. Collbran, architect. Quantities by Messrs. Strudwick & Mennie:—

	General Work.	Fireproof Flooring.
H. Toten & Sons	£9,700 0 0	£500 0 0
E. Braid	9,570 0 0	398 0 0
Kirk & Randall	9,513 0 0	513 0 0
Thomas Boyce	9,490 0 0	480 0 0
McLachlan & Sons	9,479 0 0	400 0 0
Colls & Sons	9,420 0 0	526 0 0
Martin, Wells, & Co.	9,415 0 0	500 0 0
Higgs & Hill	9,240 0 0	420 0 0
Ashby Bros.	9,100 0 0	578 0 0
B. C. Nightingale	8,993 0 0	520 0 0
G. H. & A. Bywaters	8,975 0 0	500 0 0
Perry & Co.	8,869 0 0	500 0 0
Robert Smith	8,480 0 0	484 0 0

For assurance offices, St. Giles, Norwich. Mr. A. G. Lacy, architect:—

North	£1,682 0 0
Hawes	1,655 0 0
Hall	1,500 0 0
Youngs	1,500 0 0
Wilkin	1,499 0 0

For the erection of detached villa residence at Nether-street, Finchley, for Miss Boulton. Mr. Thomas Newell, architect. Quantities by Mr. Sidney Young:—

Woodward, Finsbury	£3,100 0 0
Nye, Ealing	2,920 0 0
Staines & Son, Great Eastern-street	2,896 0 0
Gibson, Southall	2,784 0 0
Kearley, Uxbridge	2,700 0 0
Goodman, Holloway (accepted)	2,699 0 0

For making roads, &c., and kerbing the same, on the Queen's Park Estate, Seaford, Sussex, for the Christchurch and Bournemouth Freehold Land Society. Messrs. Kemp, Welsh, & Pinder, Surveyors to the society:—

A. Oliver	£2,362 0 0
F. Harrison	1,575 0 0
Woodham & Fry, London (accepted)	1,560 0 0
J. Dibley*	1,190 0 0

* Does not include kerbing.

For proposed additions to St. John's Church, Highbridge, Somerset. Mr. John Norton, architect:—

	Nave aisle.	Chancel aisle.
Charles Trask	£974 0 0	£323 0 0
S. Taylor Harvey	918 0 0	330 0 0
Joseph W. King	941 0 0	272 0 0
W. Cowlin & Son	870 0 0	268 0 0
Coleman Bros.	822 0 0	265 0 0
William Crocker	809 15 0	270 0 0
John Palmer	747 0 0	227 0 0
G. Horne & W. Lynham	725 0 0	230 0 0
Samuel Clarke	548 0 0	240 0 0
James Wilcox	640 10 0	145 0 0

For re-building Nos. 25 and 27, Hall-place, Paddington, to be let in flats, for Mr. Thurgate. Mr. Thomas Durrant, architect:—

Downs	£1,296 0 0
Brighton	1,250 0 0
Smith	1,086 0 0
Phillips	998 0 0
Higgs	967 0 0
Edgar	853 0 0

For drainage and other works on the Eversfield Estate, St. Leonard's-on-Sea. Messrs. Fowler & Hill, surveyors:—

Bull	£599 0 0
Dibley	485 0 0
F. Cruttenden	480 0 0
King (accepted)	375 0 0

For making-up and sewering private roads in the parish of Chiswick, according to plans and sections prepared by Mr. Henry Oliver Smith, C.E., for the Chiswick Improvement Commissioners. Quantities supplied:—

	Group A.	Group B.
Neave & Sons	£11,400 0 0	£6,535 0 0
Joseph Mears	11,301 0 0	6,274 0 0
Wheeler & Hinton	11,019 4 4	6,040 12 10
Mowlem & Co.	10,973 1 4	6,213 14 2
Harry Smith	10,708 0 10	6,126 14 2
G. Aldred	10,696 6 2	6,109 17 4
G. Ball	10,559 17 2	5,763 6 6
G. G. Rutty	10,236 19 10	5,739 3 11
Nowell & Robson	9,743 19 4	5,557 7 9
G. Torkington	8,685 0 0	7,068 15 7

For block of buildings, Lewisham-street, Westminster. Mr. W. Gillbee Scott, 102, Guilford-street, Russell-square, architect:—

Macey & Son	£8,800 0 0
John Grover	8,783 0 0
John T. Chappell	8,460 0 0
Kirk & Randall	8,415 0 0
J. D. Hobson	7,982 0 0
W. Scrivener & Co.	7,929 0 0
T. W. Smith & Son	7,800 0 0
J. & H. Mills	7,800 0 0
Thos. Boyce (accepted)	7,700 0 0
Howard & Dorrell (withdrawn)	7,050 0 0

For Lynn sewers. Mr. W. H. Wheeler, engineer:—

J. Bell, London	£7,876 0 0
Dawes, Lynn	7,704 0 0
Bardell, Bros., Lynn	7,220 0 0
Barwell, White, & Co., March	6,950 0 0
R. Walker, Terrington	6,901 0 0
Pearson, Bradford	5,998 0 0
W. J. Botterill, London	5,933 0 0
Neave & Son, Lewisham	5,830 0 0
W. Rigby, Worksop	5,550 0 0
Cook, Bennett, & Co., Spalding	5,300 0 0

For certain alterations and additions to the English Baptist Chapel, Abercarn, Mon. Mr. E. A. Lansdown, architect, Newport:—

I. Linton (accepted)	£855 0 0

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The Builder.

VOL. XLIII. No. 2063. SATURDAY, AUGUST 19, 1882.

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The Activity of the Building Trades in 1881, *as shown by the Parliamentary Returns.*

IT is beyond the limits of the *Builder* to pursue into any great detail the general movement of the trade, commerce, and finances of the country, except in so far as the study may throw light on the probable activity of the building trades, the price, import, and distribution of building materials, and that change in the localisation of industrial activity which so immediately affects both the amount of rents and the demand for the construction of new houses. As to this, we have more than once called attention to the fact that the builder follows closely on the heels of any movement that increases the shipping activity of special ports, towns, and harbours; and, indeed, that building may be said to march hand-in-hand with maritime activity.

It is, in this view, a matter for no little consideration to observe that the year 1881, for the first time in the present century, has witnessed, as far as statistics may be relied on, a direct check to our mercantile maritime movement. From the year 1800 to 1840 the growth of our shipping was without parallel, example, or approach in the history of the world. The tonnage that left our ports in 1840 was rather more than twenty-four times the aggregate amount of that which left our ports in 1800. Nor were these exceptional years; that marvellous increase was not made by fits and starts, but was as steady as it was swift. It was mainly due to the application of the steam-engine to industrial purposes, and to the immense preponderance which the possession of our coal-fields, and the command of machinery unknown elsewhere, gave our manufacturers in the markets of the world. As far as our inland communications went, our roads and their service were at their acme of perfection; our canals did the heavy work of transportation very cheaply, and our railways were just commencing their activity.

From 1840 to 1880 remarkable progress was no doubt made, but it followed a much diminished rate of annual increment, when we compare, not bulk with bulk, but percentages of growth. Our export tonnage was multiplied rather more than sixfold in this period. It may almost be said to have been created in the first forty years of the century; it was increased fourfold in the next thirty years, but the amount reached in 1872 was increased by only 36 per cent. by 1880. With that year, as far as figures yet go, the crest of the wave was reached. The tide has turned, and a sensible ebb has set in. We are far from asserting that the check is permanent; nor do we wish to take the disagreeable office of predicting misfortune. But it is idle to shut our eyes to facts; and the facts, as far as they are represented in the Statistical Abstract of the United Kingdom for 1881, are such as we now cite. The total tonnage of British and foreign vessels (sailing and steam), which entered and cleared the ports of the United Kingdom, from and to foreign countries and British possessions, in 1881, should have been, if the average increase of the last fifteen years had been maintained, about 800,000 tons more than in 1880. On the contrary it was 786,518 tons less, being a movement in arrear of almost equal amount to the expected movement in advance. The fact that this phenomenon has now occurred for the first time in the century is one that demands very grave consideration.

One other fact may be cited, in abatement, to some extent, of the menace of the foregoing. The diminution in the tonnage of cargo-laden vessels is not so great as the general diminution. For the last fifteen years the proportion of vessels entering or clearing our ports in ballast has steadily diminished, as compared with that of the cargo-laden vessels. In 1867, out of 32·7 million tons of shipping, 28·1 million tons were cargo-laden. In 1881, out of 57·9 million tons of shipping, 49·5 million tons were cargo-laden. The tonnage of cargo-laden vessels entered and cleared in 1881 was only 117,550 tons less than that in 1880. The number of men employed in the British and foreign trade was very slightly less in the latter year than in the former. But the vessels on the register, although 661 fewer in 1881 than in 1880 had a tonnage of 156,000 tons more. And the activity of the shipbuilders, so far from having experienced any check from diminution of traffic, has increased. The number of vessels built and first registered in the United Kingdom in 1881 was larger than has hitherto been known in any one year, with the sole exception of 1874, and was actually 24 per cent. more than in 1880.

If the great barometer of shipping tonnage thus points to change, the no less important indications afforded by the statistics of our mineral produce give the signal "set fair." The coal raised in 1881 was five per cent. more than the yield of 1880. The estimated value of the coal won, at the place of production, has followed the same ratio. The increase in the total value of the coal and metals produced in the latter year is not much less in proportion; the yield of 1881 being almost exactly the double of that of 1869. Putting these various returns together, it seems pretty clear that our home trade is increasing more than our foreign trade, a sign which, in itself, is one of comfort and of hope. Not that we would have the foreign business less, but that we would have the home business more. The activity of the builder is far more likely to be measured by that of the miner than by that of the shipper. In fact, while our purchases from the foreigner (so far as they can be measured by the total value of imports and exports) are 14·2 millions less in 1881 than in 1880, our sales to him are more by 10·6 millions sterling of value. This turn in the tide, at which we are convinced most men of business will rejoice, is not only promising in itself, but also to a great extent explains why the decrease in cargo-laden vessels is so much less than that in the general mercantile tonnage. In 1880 the excess of imports over exports was 124,000,000*l.* In 1881 it was only 100,000,000*l.* Without entering into any debatable matter with reference to the balance between our incoming and our outgoing business, it is tolerably certain that the more nearly an actual balance is approached, the less necessity will there be for the departure of vessels in ballast from our ports. It is, then, possible to reconcile a decline in shipping tonnage with an advance in national prosperity; and such, we venture to hope, is the true outcome of the returns.

It is, however, the fact that the gains arising from any profession or trade, including the property on railways, canals, mines, gasworks, waterworks, &c., as far as they are measured by the income-tax returns, are less by rather more than three per cent. in 1881 than they were in 1880,—less, in fact, than in any year since 1874, when the amount returned under this head was about 400,000*l.* more than last year. The owners' value of lands and tenements has increased by more than 2½ per cent. in the year; the occupiers' value is nearly stationary. On the whole, the income-tax returns show that the slight decrease in our wealth within the year of 1,200,000*l.*, is the balance between the natural increment from economy,—spending less than our income,—and the decrement in the activity of trade. These returns, however, are not exactly parallel to those as to shipping and mining, as they are made up to the 5th of April, 1880, instead of to the end of 1881. The increase in the value of lands and tenements is due in no small degree to the builder, the valuation of houses in 1880 being 5,000,000*l.* more than in 1879. Since 1860 the value of houses has increased in England from 66,000,000*l.* to 100,000,000*l.*; and in Scotland, from 6,000,000*l.* to 11,750,000*l.*; while in Ireland it has sunk from 3,450,000*l.* to 3,160,000*l.* The extraordinary activity of building operations in Scotland, showing a duplication of value in fifteen years, must be due in no small degree to the immense impulse given to the industry of

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the Valley of the Clyde by the improvement of the navigation of that river. And, considering the intense and increasing interest which our great manufacturers are taking in the subject of inland waterborne communication, as to which not a week passes without some fresh indication, we think that the difference in the annual value of English, Scottish, and Irish house property is pregnant with significance.

MEASUREMENT AND DESIGN.

At one of the Royal Academy exhibitions, not long ago, we were reminded by Mr. Marks, in his own peculiar vein of dry humour, that "science is measurement," the sentiment being illustrated by the representation of an aged and cautious *savant* carefully measuring the separate bones in the skeleton of a bird, with a view to establishing and noting down its proportions. The ornithologist's position in this case was a perfectly logical one, and the motto might, no doubt, be much more widely applied, and would include subjects coming under our special domain. To the engineer, for instance, science is measurement, — measurement of strain, of forces, of co-efficients of friction; almost everything which he does is reducible to measurement in one way or another, and the more accurate his measurement the better will his work be, and the more likely to prove durable. As has been indicated in an important article in our last number, there seems every probability that it was to insufficient and theoretically inaccurate measurement of wind-force that the lamentable fall of the Tay Bridge was, in a measure at least, to be traced, and that it was at least most improbable that its unfortunate engineer, though he cannot be held altogether free from blame, would have allowed so inadequate a margin of strength if he had been in possession of a more trustworthy theory on which to estimate the pressure of wind. And of course to that portion of the architect's work which is essentially practical the dictum applies as fully as to that of the engineer, in theory at all events; though, in fact, the architect is less often called upon to deal with structures in which the question of strength and stability occupies so completely the foremost place, and requires such nicety of calculation, because it is very seldom that he is called upon to build for practical security alone. The mere demands of architectural effect necessitate, in many cases, a larger margin of stability than an engineer would consider it his duty to allow consistently with the economics of construction. Apart from this, however, of course the architect's practical work is concerned with calculation and "measurement" in the same way as that of the engineer.

The question about which there has been, and no doubt will continue to be, much more difference of opinion, is, how far this element of measurement enters into and influences the other side,—the artistic side,—of architecture. There are, of course, two different relations of measurement to architectural design; that in which measurement is applied to ascertain the proportions of old buildings, and that in which it is used to evolve and regulate the proportions of new ones. Of the use of measurement with the former object we were reminded again by the account of the labours of some American students, whose first report of their work in Asia Minor was noticed at some length in our last number. The employment in which our American allies have shown such praiseworthy zeal and desire for exactitude is exactly analogous to that of Mr. Marks's ornithologist measuring the skeleton. Measurement is the most certain or the only way of arriving at exact conclusions in regard to the main dimensions of an edifice, and the proportions of its details so far as they are measurable, and of gaining ground on which to base any theory in regard to the canon of proportion which may have been followed by the original builders, or as to whether or not they did follow any canon of proportion. In this respect the more recent students of architectural remains in Asia Minor have no doubt valid cause to complain of their French predecessor who has left such an unfortunate character for inaccuracy; though if all draughtsmen and measurers who had published inaccurate drawings of architectural remains were to be arraigned in like manner, the list of defaulters would be a very long one. There is no class of illustrative drawing among which such extraordinary and perverse inaccuracies are to be found than among architectural drawings and engravings, which appear to become more wild and inaccurate the further back we go from the present time. The drawings of Villars de Honecourt form a notorious instance, in which a Gothic architect bent on building in the style of his day apparently found it absolutely impossible to draw buildings which he saw before his eyes, not in decay, but in a comparatively fresh stage of their existence, without putting in his own fancies, inextricably intermingled with vague representations of something like the actual detail. When the time came that Gothic buildings were sketched, as they occasionally were, by draughtsmen of the Renaissance school who had no eyes to see correctly the Mediæval detail, and when the drawings were subsequently translated into engraving by engravers who further misrepresented the drawing, which was itself a misrepresentation, the results were, in a different way, just as curious and as wide of the mark. In modern times the scientific spirit which has exercised such an influence over almost every department of human life and human work, has had its effect on architectural sketching and drawing as well as upon more important studies, and of late years architectural students have been over and over again exhorted to measure in addition to sketching, and to make measured sketches their chief work in carrying away records of existing buildings; and the feeling in favour of greater accuracy and conscientiousness in these matters has so far spread that probably we shall never again have to complain of such inaccuracies and absurdities in architectural illustration as those which, at one time, were contentedly accepted without question or criticism.

These conscientious efforts to secure accuracy suggest, however, one or two lessons for us in regard to the limits which are placed to the measuring system in illustrating architecture, and the snares into which it may lead the practitioner. One of these is the desire on the part of the draughtsman to find a geometrical system in the building which he measures. The very act of illustration by means of measurement seems to lead the mind in the direction of looking at everything from a geometrical point of view. One or two coincidences of measurement suggest a special theory of proportion, and that once suggested to the mind it is wonderful what a tendency there will be in the dimensions subsequently taken to accommodate themselves to the supposed theory. Fractions of inches, or even of feet, which do not fall in properly, will be dismissed as trivial, or as due to settlement, or some other cause of disturbance; and with these little helps and accommodations a very consistent and beautiful key to the law of proportion of the structure, and the theory of its builders, may be made out, published, and adopted by as many readers as are predisposed to take similar views, or are from any other cause easy of conviction. The strength of mind to resist all these snares, and to confine the operations to recording with the greatest possible exactitude the actual dimensions existing, leaving it to be seen afterwards how far they will lend themselves to any consistent theory, is not given to all. In saying this, we are, of course, not controverting the idea that there has been a use of strict modules of proportion in architecture, or that some such cases have been rendered obvious by measurements of the structure; but we hold that the temptation to imagine and thereupon to discover their existence is very great, and has certainly not always been resisted.

One thing, however, every one may admit, viz., that where geometric proportions do exist in a building, measurement properly conducted may and will discover them, unless the building should have been so shaken in its lines by disturbance and settlement that its geometric proportions are practically destroyed. But there are qualities in most architectural monuments that are worth anything, as there are in most works of art of every kind, which measurement cannot thus accurately discover and represent. Even the more prosaic and practical details of ornament included under the head of mouldings present great difficulties in regard to their accurate reproduction, which can only be fairly met by the agency of special contrivances for recording them automatically. And still more is this the case when we come to that class of detail which represents the higher form of ornamental work, rising in scale from sculptured foliage or other ornament to the highest class of ornament, decorative sculpture. If this work is to be reproduced and illustrated, we know that something more than the mere measure rule and compass must come in here. We know that there must be the mind to appreciate the expression and style of the work, the sensitive eye to detect the little minutiæ of modelling which no measuring can hunt out or give expression to, and the trained and delicate hand to transfer the outline and the effect to paper. In dealing with this part of the work we are in the region of purely artistic production, and experience constrains us to admit that though science may be measurement, art is not measurement. Mr. Penrose could give us the mathematical expression of the curves of the Parthenon columns and entablature, and they could be drawn out again from their elements as thus expressed; but not the most accurate measurement (and none could have been more accurate than his) could have given us in measured dimensions the mathematical expression of the Theseus, nor could any hand reproduce it with the same precision with which the proportions of the building could be reproduced by measurement. Art, as we have observed, is not measurement; and if so, may not the converse question be added, "Is measurement art?" And how does the answer to that question affect some theories as to architectural and decorative art?

Architecture is believed by many people to be an art,—not, like engineering, a science alone; a creed of which, it is needless to say, we are adherents. It is also a belief held by some, though not so numerous a body, that architectural design, to be true and permanently satisfactory, must be based upon regular ratios of proportions in regard to height, length, and breadth, and in the proportions of details to the whole. The advocates of this view of architectural design (many of whom, it may be observed, are not practical architects) are severe against what they call the haphazard way of designing to which those, they say, are reduced who do not pin their faith to any theory of proportions. Such persons are only able to design by trying various effects and proportions in sketches, and finally accepting what seems best to the eye; whereas the man armed with a theory of proportion has his way marked out for him, and has only to decide the dimensions of one or two leading lines of his building, and the other proportions follow as a matter of course. Without saying at once whether this is or is not the best way of producing buildings that are satisfactory to the eye, it seems certain that this kind of design by calculation is not "artistic" design in the sense in which the words are generally used. As we have seen, the higher we rise in the scale of art, so far as the accessories of a building are concerned, the less possible is it to reduce these to measurable expressions, and to illustrate them by means of measurement. If this is the case in regard to the parts, are we then to take it that the case is just reversed when we come to the whole, and that the building itself is higher in the scale of art when its method of "design" is capable of expression in figures, and depends upon the exact observance of minutely measured proportions. There is no doubt that if we take any well-known and well-designed style or order in architecture, we find certain general proportions of parts which cannot be widely departed from without offending the eye and the judgment of every practised architect; just as in the human figure we find a certain normal proportion of parts which cannot be widely departed from without a similar unsatisfactory result. In both these cases, however, we believe it is impossible for any one to assert positively, or at least to prove his assertion, that the proportions which seem satisfactory to us in the building and in the figure acquire this satisfactory character from any source but that of the habit of eye, coupled with the knowledge which experience gives us as to the proportionate strength required in different portions of the human frame or of the built structure. We are accustomed to see the column, capital, architrave, and frieze of any one of the Greek orders exhibiting certain general proportions of scale, and to see any of the members of that order of architecture decidedly differing from the customary scale would annoy our taste; but this is probably only a matter of habitude of perception, unless in such a case as, for instance, making the columns much too thin for stability. In that case our knowledge of the strength of

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materials would come in, and the result would seem unsatisfactory, whether we were used to such proportions or not, if the column were actually doing the work of a support, and not merely part of a superficial imitation of construction. And, therefore, no doubt, things being as they are, the man who had studied the general proportions of the orders would be more readily able to make a design satisfactory to our taste than he who had not. We should feel a slip from these recognised proportions just as disagreeably as we feel a slip in grammar when we hear it; yet the rules of grammar are not part of the inner and necessary nature of things, but the result of custom and general agreement as to the relations of words; and so with the architectural design. In like manner an artist would have more readiness and power in drawing figures of the highest type if he had arrived by study and observation at a clear opinion as to the best normal proportions of the figure, which merely means the proportion embodying the most typical form selected from the average of the best available specimens of humanity.

But in both these cases it is one thing to have a settled idea as to the best proportions of the order, or the Gothic bay, or the figure; another thing to make a necessity of carrying out these proportions according to minutely-graduated dimensions, the relations of which can be expressed in figures, and their existence thereby proved to the understanding, but which the eye has no power to take certain cognisance of. If a painter told us not only that the general proportions of the heads, bodies, and limbs of his figures were in accordance with the best canon of proportion obtained by observation and measurement, but that their features were also minutely regulated in the same way, and that only thus could the true human expression be attained and represented by the artist, we should anticipate the result in a set of faces, handsome perhaps, but rigid in feature and monotonous in expression, and we should be disposed to answer him with Bacon's saying, that a painter doubtless may make a more beautiful face than ever was in reality, but that he must do it "by a kind of inspiration, as a musician produces an air, and not by rule." And may not the same answer apply to architecture? If a man tells us that there is a special proportion in all the parts of his building, so that all, down to the smallest detail, follow a certain rule of ratios of proportion, and that this has been so conscientiously carried out that a difference of an inch in the entire width of the building would impair its harmony and consequently its beauty, and that proportions of mouldings have been carried down to a small fraction of an inch, it is certain that a mind not prejudiced in favour of any mathematical theory of proportion, but judging by the power of observation of a trained eye, would regard as useless pedantry a theory which dealt in proportions so minutely balanced that the eye could not estimate them, and the mind could only be made to understand their existence by a process of calculation and expression in figures,—a theory which told him that the relations of height to breadth were calculated by inches or by still more minute fractions of the module adopted, when his experience told him that these proportions might vary even as much as a foot, or a whole module, one way or another, without the spectator being able to say positively, from the evidence of the eye alone, whether the demands of the theory had been fulfilled or not. Bacon's remark about music, to which we referred just now, has, in fact, a more direct bearing by analogy on the subject than many people are aware of,—more direct than Bacon himself was aware of. For modern investigations have placed it almost beyond doubt that our musical scale itself is in the main arbitrary; that, with the exception of the fifth, which is settled by its occurrence in the harmonic series and by other considerations, the other intervals might have been almost anything else which the original and half-unconscious framers of the scale had chosen to make them; that the satisfaction of our ear with the scale as it exists is chiefly that of habit (to a great extent inherited); and, more significant still, that a large proportion of the intervals and combinations preponderant in music are theoretically wrong and incompatible with each other, and that intervals and harmonies which are represented by the same written signs ought theoretically to vary in two or three different ways according to their relation to the context, and that by a very delicate and trained ear their differences from what the notes theoretically ought to be are, in some cases, even quite perceptible. All this, or most of it, has been discovered since the greatest musical compositions (the architecture of sound) were put together, and the great composers mostly knew nothing about these facts, and cared less. They wrote from the sense of melodic feeling and expression, and from the gradually increasing sympathies and habitudes of the cultivated ear in regard to harmonic combination, and the mathematical part of the matter has been discovered since. The older composers were very much bound down to rules in another sense,—rules as to the progression and succession of harmonies,—and the great composer of each succeeding epoch has broken through and set aside some of these rules, showing that good effects could be produced apart from their observance, and thus approximating more and more continually to the conclusion which has even been deliberately expressed, that "whatever has a good effect is right."

The analogy between music and architecture has been so often (and not unreasonably) drawn that there is the less reason to apologise for the question whether there may not be a great deal in regard to even the superior forms of architectural design which may be judged in the same way as we judge about music. Looking at the matter in this way, we may be at least allowed to imagine that architectural beauty, like musical beauty, is evolved from a sense of beauty and harmony of contour and proportion in a trained mind, acting through the eye, without the necessity of mathematical rules of proportion to guide such an eye; that in architectural proportion, as in musical proportion, "whatever has a good effect is right," and that this "good effect" is evolved and appreciated by the feeling and the eye, and not by formulæ; and we might even venture to suggest that if the Greeks were really so much under the dominion of a mathematically expressed theory, as some people suppose, the monotony of expression, which is, perhaps, the one serious shortcoming of their exquisitely refined architecture, is actually due to this subordination to an arbitrary theory, just as the comparative monotony of expression of the older school of "contrapuntal" composers in music is due to their compliance with arbitrary rules, from which the composers of the romantic school, like the architects of the romantic school, emancipated themselves.

We may pursue the subject further in another number, by considering the proper influence of measurement and measurable proportion in architectural detail and ornamental design.

THE ART OF THE ARABS.*

Their secular art, the art of their palaces and their houses, is broader and more tolerant. We are all familiar with the effigies on their coins, the figures and animals engraved on their vases, and painted in their manuscripts. With the Arabs, however, their rigorism strangely fettered their artistic skill. It cannot be said that the Arabs have ever shown the power of carving or designing a plant; in their hands it possesses none of the realistic character we see in Classic art and its direct derivatives. This, of course, is the great feature of Arab art, which is merely conventional in its representations, using flat patterns as it does flat colouring varied only by simple lines. But their artists work with the utmost minuteness, and their repetition of geometric forms is positively bewildering in its methodical variety and refined beauty. As a detail it is beyond doubt that the Egyptian hieroglyphs suggested to the Arabs the use of inscriptions as a form of decoration. Their art, sober, delicate, and, at its birth, frail, was, we have evidence, far less geometric than it eventually became. Their architectural surfaces were bare, broken only by a few small windows, arcades, or some slight ornamentation placed without much geometric precision, but invariably expressive of a refined fancy. Later on they covered their surfaces more fully, and geometric symmetry is more studied. The decoration is a wealth of splendour, but merely the variation and repetition of the simplest geometric forms; the slightest change of line permits of an infinite variety of ornament, and what we admire, is after all, chiefly the work of an indomitable patience.* Very different is the spirit to that in which some choice detail of foliage or some saint-protecting niche or canopy was sculptured by a contemporary artist in the Gothic cathedrals of the North.

By their conventional representation of the beauties of nature, it is difficult for us to understand how their artisans conceived its expression; it would seem, as has been suggested, as if their sentiment was analogous to that by means of which music is felt, and that their creations were the combinations of notes, of figures, and of lines; compositions, the basis, the support, and the source of which was geometry, forced on them for their decorative elements by the exigencies of their religion.

One element in the formation of their art must not be overlooked, the surroundings in the midst of which the Arabs lived. For the Arab, as for the early Jew, the only monument he knew was the tent, his only luxuries his tissues and arms. His habits were in no harmony with the richly-sculptured surfaces of the Greek and Roman art he abhorred, and remains of which he met in every direction. Forbidden to use for decorative purposes the representation of man and animals, there alone remained geometry, the creative element of all the principles on which the material order of the universe is based.† Their art, therefore, is essentially decorative and all superficial; in architecture Arab art shows itself essentially the art of a poor people; it builds rapidly and not too well, with fragile materials, largely using coloured tiles as easily made, effective in decoration, and costing less than sculpture; but it is to be noted that, wherever there existed important monuments built of solid materials, there the Arab conquerors built their mosques with equal strength. In India, in Egypt, their architecture is massive. In Persia, where the anterior civilisation had but a feeble architecture, the Arab architecture is equally fragile. In Spain and Africa the Moorish architecture is purely decorative, a fact which constitutes its inferiority, and the reason why it is impossible to form a judgment of its spirit by a mere acquaintance with its Moorish creations. The interest of Moorish Spain and Algiers, roused by poets and by travellers alike, the romance of the Alhambra, is still, as it was when the West was first made acquainted with the East, almost entirely the sole conception formed of Oriental art. All its creations, as has been urged, are seen through the glamour of the Alhambra. A familiarity with Arab art is alone to be gained by a study of its productions as they are to be seen scattered over the vast area which their armies conquered, stretching from India to the South of Europe. It is an art to be judged by other standards than those by which we criticise the art founded on the model of Greece. It is an art profoundly influenced by its surroundings, by the climate, by the spirit of the people, by the life they led.

Ebers has remarked that the Arabs in Egypt never used in their edifices any Pharaonic relic, a fact which, doubtless, may be attributed to some superstitious fear. He describes the old mosques as originally in no way houses of prayer, but formed of an open court-yard, surrounded by a portico supported on columns, those most decorated being invariably turned in the direction of Mecca, the city where rest, as is well-known, the remains of the Prophet. The minaret, so essential a feature of the Arab mosque, was not, it appears, in use at the outset, and it would be very difficult to exactly decide on its origin. Was it suggested by the obelisk? by the architectural piles which flank the doors of the Egyptian temples? by the towers or observatories of Assyria? by the strange Phœnician tumulary edifices? the legendary columns of Solomon's temple, which were Egypto-Phœnicia-hebraic? by the towers of the Christian churches or the donjons of our feudal castles? The first minarets appeared at Damascus in the eighth century.

The oldest mosque, that of Amr the first conqueror of Egypt (in Cairo) bears no trace of what we understand as arabesque ornamen-

* See p. 202, *ante*.

* M. Bourgoin's two works on Arab architecture cited before, will be found to afford the most valuable information relating to the elements of Arabic decoration. M. Bourgoin has dissected the apparently complicated mode of interlacing-Saracenic decoration, and has shown its simple formation to rest on purely geometric forms. To those studying the decorative arts, M. Bourgoin's works will be found to be of the utmost value.

† Viollet-le-Duc.

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tation. Arab decoration was not, as we have seen, a sudden creation; such as we find it, it was elaborated from existing elements after the time that all imitation of living nature was proscribed from the temple.

It is a peculiar feature of Arab architecture that it will be found to copy everywhere, as has above been remarked, the monuments existing in the countries conquered by their armies. In Egypt, in Arabia even, the primitive architecture preserves a marked and borrowed style,—Persian, Assyrian, and Phœnician,—to such a pitch that a strange analogy will even be found between these edifices and certain Etruscan tombs; the generally differing styles of both being derived from a common source. Other constructions, again, such as fortified gates, have a marked Roman character, and singularly resemble the military European architecture of the Middle Ages; they possess the same strength and solidity, and doubtless were copied, some from the buildings erected in Syria by the Crusaders, others from the military architecture of the Byzantines. In other directions the Byzantine style is again traceable, notably in the bulbous cupolas.

When, at length, the Persians, become Mussulmans, adopted an architecture many features of which,—the broad ogivale arcades and the long slender bays,—were handed down from the Greco-Roman period, the Islamites adopted the new Persian style, which we soon see spreading throughout the whole Mussulman territory. As it is impossible not to perceive, there are often striking analogies between certain characters of the Arabo-Persian style and that of our Northern Ogival or Gothic.

The use of brilliant colours for decorative purposes, introduced in mosaic, in tiles, and bands of stones of various colours, is, as is well known, a leading element of Arab architecture, —an element introduced with the Renaissance into the architecture of Italy. At the outset the Arabs used the glass mosaics of the Byzantines, and imitated very closely in their tissues and carpets and rugs the Greek stuffs. Later on the Syrian and Persian faïences appeared to them more appropriate to their tastes and symbolic ideas, they adopted their use, and applied not a little of their style to the design in their stuffs. Thus it is not difficult to confuse the early Arab tissues with those of Byzantium, but later on the Mussulman decoration assumes a character of its own which is markedly distinct.

Islamite art preserved zealously almost all the great industries which existed in Persia and in the Egyptian territory when in the seventh century the Arabs took possession of the country; their tissues, their pottery and glass, their metal vases, their arms, ivories, inlaid and carved woods, leather work, and their delicate book illuminations. It is none the less certain, however, that little by little the exclusive rigorism of the sect of the Sunnites, became fatal to art. Even with those who tolerated the representation of the human figure, scruples seem often to manifest themselves; for on a large number of metal vases, of pieces of pottery, and even of illuminations, the face is not expressed: the oval of the head will be found left void. The representation of the animal caused far less embarrassment to the devotees, to judge by the works of art which have been handed down to our time.

Islamism, however, it cannot be denied, exercised on art a fatal influence by impelling it in one and that a special direction. Throughout the civilised world each people had till their time personified the various forces and phenomena of nature under the forms of divinities. To each of these was given the features and the costume of the race, surrounded by the animals and the plants of the country, introduced into legends typical of the national customs. Art under these influences became great, it became an important factor in the civilisation of the world, one of its most active agents. Islamism dealt a fatal blow by breaking this living tradition, by severing the bond which united God to man, to the animals and to the plants, and reducing all the decorative forms to a mystic and geometric abstraction. But even under these numbing influences the human intellect struggled violently to assert its power. In the works of these simple artists and artisans there is still evident the effort to express the force of nature. The beauty of the vegetation, the melancholy of the desert, the deep blue of the sky, the grandeur of the setting sun, the splendour of the peacock in his glory, we feel sure, stirred their artists as they traced their brilliant designs, as they painted with their bright colours their gorgeous tiles and illuminated manuscripts, and wove their brilliant stuffs, and circled with their red bands the delicate minarets of their mosques. Music in colours, such has Islamite art been defined, and its efforts show singularly the earnestness of its artists in the use of the simple means at their disposition, when we see how profoundly it stirs our sense of admiration. But, after all, in spite of the exquisite beauty and variety of Saracenic art, which authorities have found in many details to excel even that of Gothic in its best days, how far behind our vast, our powerful, and perfect artistic conceptions of ideal beauty does this art of the Arabs fall.

THE WATER SUPPLY OF ALEXANDRIA.

At a time when the word "Egypt" finds an anxious echo in so many English homes, it cannot fail to be of both general and special interest to give information as to any of those physical facts which, taken together, make up the outline of the situation in which our troops will so soon find themselves. And from this point of view it is of especial interest to watch those points when Eastern and Western civilisation come into contact, or it may be into collision. In no respect is there so broad a contrast between the principles (if we cannot say the habitual practice) of the East and of the West, as in what relates to sanitary measures. We may say that in the countries tenanted by the more intelligent Western nations it is agreed that there is such a thing as sanitary science, and that attempts are made, however inadequate and however spasmodic, to carry out these principles in practice. In the East, on the contrary, there would seem to be no admission of any such doctrine. Climate, race, religion, are all,—we do not wish to say anti-sanitary,—but fail to find a more expressive or appropriate word. The luxurious languor produced by the beams of an Egyptian or a Syrian sun is wholly incompatible with any sustained energy in the construction or the visitation of drains and sewers. Bathing, no doubt, is in Mahommedan countries, a luxury as well as a religious observance; but there is a great difference between the ablutions prescribed by Islam and the devotion shown by the Englishman to the morning "tub." While as to the most obvious precautions for preventing the distribution of germs of disease,—Bismillah, many a Moslem, not to add many a Jewish doctor, will be only too apt to regard them as somewhat profane, as a flying in the face of Providence, and as an infidel doubt of the truth that "what is written" (in the book of fate) "is written."

In Syria all this has borne a fruit which must go for much in any sane forecast of the future of that country. The supplies of water are so poisoned by the neglect of sewerage that fevers of more or less venomous nature are all but unavoidable. And there is ample evidence to show that the mere precaution of the use of condensed water makes a difference in the death-roll of European troops much more important than the result of a great battle or even of a series of battles.

Alexandria is for the most part supplied with water for domestic purposes by a canal. The old canal of Alexandria is often referred to in the Napoleon correspondence at the time of the seizure of Malta and of Egypt by the French in 1798. It was probably of date coeval with the foundation of the city. Mehemet Ali, when Pasha of Egypt, conceived the statesman-like idea of enlarging this ancient aqueduct into a true canal, fitted to discharge the three important functions of water supply, irrigation, and navigation. In 1842 this enlarged canal, called after the Pasha the Mahmoudieh Canal, was connected by a lock with the River Nile at Atféh; and in 1849 M. Linant de Bellefonds, a French engineer, erected at Atféh steam pumps and machinery for pumping water from the Nile into the canal. This, however, was intended only as a subsidiary source of supply, and, in point of fact, M. Linant de Bellefonds, in his "Mémoires sur les principaux Travaux publics en Égypte," which is the source of most of the information now accessible on the subject, complains that owing to the habit of feeding the boiler furnaces of the pumping machinery with old chopped straw, only about one-sixth of the calculated duty is performed by the engines.

The true feeder of the Mahmoudieh Canal is the Canal de Khatabé, which falls into the former also near Atféh, its course being nearly at right angles to that of the larger waterway, which is about parallel to the shore line of the Delta. But the Khatabé Canal is almost torrential in the movement of its waters, which have a fall of 24 ft. in their course. Owing to this, it brings down such a quantity of mud and silt as to render it essential frequently to clear the Mahmoudieh Canal from its unwelcome contributions. This, however, has been wholly neglected, and the Mahmoudieh Canal is now so choked as to be impassable for vessels, and to yield very little water for irrigation; while as to the supply of water for domestic use at Alexandria, it is necessary to keep the canal so full,—up to the very top of its banks,—as to endanger the latter, and to make it a very easy matter to cut off the supply of Alexandria.

The population of Alexandria (without, of course, making any allowance for our troops) is stated in the last returns that we have seen at 214,000 souls. Comparing the water-supply of Toulouse and Besançon with that of other and more generally known towns, M. Linant de Bellefonds arrived at the allowance of one cubic mètre of water per diem for ten souls. This is almost exactly 22 gallons per day per unit of population Toulouse allows 80 litres, or 17·6 gallons, and Besançon 100 litres, or 22 gallons, the latter thus being taken as the guide in the case of Alexandria. At this rate, 21·400 metric tons of water per day, or nearly 9 cubic feet per second, is required for the population,—a supply which ought to be increased by at least 20 per cent. under present circumstances. Alexandria is one of the few habitable cities which does not receive from the sky in the course of the year a supply of rain-water adequate for the wants of its population, if properly caught and kept.

There can be little doubt that by the exercise of a little wise forethought the measures which are now demanded for the service of our own troops may be so carried out as to confer lasting benefit on the inhabitants of Alexandria. The clearing out of the Mahmoudieh Canal is an operation which is demanded, so far as we can rely upon the very competent authority of M. Linant de Bellefonds, for the security of the water-supply of the city. To do the least that can be done would be a poor economy. Engineering science indicates that the Canal should be restored to a condition in which it may fulfil its two originally designed duties of water supply, irrigation and navigation. The prolongation of the channel to link together the Rosetta and the Damietta branches of the Nile, which was designed by M. Linant de Bellefonds, would no doubt be an admirable measure for Egypt. It is not demanded for our own immediate need, as, although its economic value would be considerable, its military use is less important for a power that commands the sea. In 1798 the essential element of dominion over Egypt was wanting to Napoleon. Before he had been a twelvemonth in possession of the country, notwithstanding the most arbitrary and severe regulations (admirably as they are calculated from the military point of view alone), his clear-sighted genius had convinced him that the holding of Egypt was a matter of days for a military force cut off, as was his, from its base. The only word to this effect, however, that is to be found amid a cloud of regulations, embracing every conceivable detail, from the foundation of an "Institute of Egypt," to the order for the discontinuance of the *sous-pieds* to the soldiers' pantaloons, is in a despatch to the Directory, when, demanding a fresh supply of 6,000 men, with specified quantities of fusils, sabres, munitions, saddles, and other implements of all kinds, he quietly remarks,—"If you cannot find the means to make these things reach me, you had better make peace, as I shall be reduced in six months to 15,000 troops, which is not a number adequate for the occupation of the country." That he did not stick at trifles in order to spare his troops is remarkably illustrated by the despatches, in which he urges Kleber and Dessaix to "faire couper cinq ou six têtes par jour," in order to teach the natives how to behave (*se conduire*), and in which he requests the Sultan of Darfour to send him 2,000 black slaves "à mon compte."

In spite of the gigantic character of the military genius of Bonaparte, his expedition to Egypt must be put down as a costly blunder. But from the records of his incessant activity, and of the provisions of a genius which foresaw

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everything,—except the battle of Aboukir Bay, and the subsequent landing of Sir Ralph Abercrombie,—there is very much for us to learn. The cynical bad faith displayed towards the Grand Master of Malta,—and, indeed, towards any person in authority whom Bonaparte found it advisable to address,—is as much without excuse as (it is to be hoped) it is without example. But of the eminent value of the labours of the engineer Bonaparte was to the full aware; and we hope that the able men now in command of our expedition will, in this respect, take a leaf out of the book of one who, despite the frightful defects in his character, was one of the greatest captains the world has ever seen.

The allowance of twenty-two gallons per head of population per diem for the discharge of the Canal at Alexandria requires a considerably larger quantity to enter the canal. It is a remarkable fact that no cross-section of this work is given in the atlas to the "Mémoires" of M. Linant de Bellefonds, nor have we been able to discover the dimensions in the Library of the Institution of Civil Engineers. Assuming the width at 40 ft., as the evaporation in Egypt is as much as 13 ft. per annum, we cannot put it at less than half an inch per diem at the present season. This gives a quantity of 8,800 cubic feet per mile, which is equal to 12,400 metric tons per diem, in addition to the figures above given.

In the event of such a restoration of the canal as is demanded by the wants of civilisation, it will become of primary importance to ascertain whether any attempt was made by M. Coste, the engineer of Mehemet Ali, to puddle the waterway. The enormous discrepancy pointed out by M. Linant de Bellefonds between the calculated and the actual duty of his pumping machinery, seems to us to point rather to defect of puddle than to the use of straw as fuel. But this is only a suggestion, made in the absence of more exact information.

CONTINENTAL GATHERINGS.

In these days, when so few matters practically are free from the keen attacks of criticism, art, which from all time has been a fair field for severe strictures, could scarcely be expected to escape. The shuttlecock is gaily kept flying backwards and forwards, from critic to critic, from school to school, a general standard, it may be remarked, being thrown to the winds, what is abused by one is lauded by another; The various systems of art-education in vogue, or advocated by different authorities, it can easily be understood, have not fared better; and it does, indeed, seem difficult to please, not every one, but even any one. Of the sister arts, perhaps, architecture may be said to have come in for the severest attacks from the modern critics. It is not alone its creations that are criticised, it is its modes of instruction that are found fault with. In France,—to judge at least by a Parisian contemporary, the esteemed *Gazette des Beaux Arts*,—it would appear that there are influential authorities who deem, from an observation of recent exhibitions, that far too much attention is being paid to drawing in architecture, a detail in the many other serious items embraced in the education of the young architect,—a necessity, it is true, as a means of expressing his ideas and conceptions, but dangerous when made to take too prominent a place in his studies. It is to the importance given to mere graphic skill, to the "get up" of the drawings, that is attributed the absence from the yearly exhibitions of the more prominent members of the profession. It is an old quarrel, not only in France, but with us. Even here, to award prizes to architectural drawings, which are merely the scheme of the real work to be carried out, is thought by some overstepping the mark.

It is not alone from across the Channel that complaints reach us from time to time concerning the condition of contemporary architectural studies. The "Backwardness of American Architecture" recently formed a striking leader in the pages of an excellent New York contemporary, the *Critic*:—"Although in painting, and, perhaps, in sculpture also," remarks the writer, "the United States are improving from year to year, it is astonishing how architecture drags behind. An enormous quantity of building goes on here. Wards spring into being in a few years. Burned cities rise again before the ruins have done smoking. But the edifices, although sometimes loaded with ornament and constructed of costly materials, are seldom the work of an architect in the true sense of the term as now used,—namely, a master of building; as one says, a master of fine art. They are the works of masters of mechanical and technical art as opposed to the fine arts. In New York it will be the merest chance if the next public building or costly edifice does not fall into the hands of men who are not able even to sensibly 'lift' modern European ideas into architecture." Our American contemporary very properly complains of the complacency with which the public regards its ugly buildings. A lavish expenditure on the part of the wealthy seems incapable of producing any satisfactory result; while the experiment tried by the Union League Club,—the wonders of which, it will be remembered, were fully described and illustrated not long since, in the pages of one of the Anglo-American magazines,—only showed how grievous may be the elementary mistakes in architecture made even by a body of men of taste. "It is evident," remarks our contemporary, "that in the building committees appointed there is seldom or never a majority competent to select the best architect and get from him work that is worth the money expended." It would appear also that in order to obtain work the architect has not unfrequently to stultify himself; under such conditions how is it possible for him to work well?

Pretentious communities require pretentious buildings, conditions under which it is difficult to expect results of a high character. Were a more modest and an honester course pursued, our contemporary urges, a marked improvement could not fail to assert itself. "Millionaires would not build palaces in six months, but would employ architects to do work quietly; hasty work would be discontinued. The main point is, that the demand should be a demand of taste. Architects cannot be independent,—cannot educate the public,—cannot wait till they are dead for recognition. They depend almost as directly on the public as the actor, and their audience is neither so numerous nor so ready to be pleased with what is set before it. Until the public shall reform,—until the press shall begin to call owners and architects to account for vulgar, stupid, and ridiculous work,—there is no hope for American architecture. At present it represents the mere brutal force of money more than anything else. It shows, also, restlessness, vagueness of purpose, smattering of foreign styles. No wonder that many people prefer the barren monotony of bricks and mortar to the ineffectual efforts of our unhappy architects. And along with a thorough or searching criticism, such as the press can give, must go, on the side of architects and owners, the most elaborate drawings and models of projected buildings. For, alas! the building once in a place is there practically for ever. Criticisms are forgotten, and people accustom their eyes to the ugly mass. Then associations give it dignity, and the city is saddled with a dull and pointless building, to which the citizens cling with a fervour worthy of a St. Peter's or an Alhambra."

A few days since a most agreeable and original entertainment was given in Paris by M. Bartholdi, the French sculptor, to a number of guests on the platform of the scaffolding,—to which the luncheon was hauled up by ropes and pulleys,—of his colossal figure of Liberty, the figure, it will be remembered, which is eventually to be erected in New York Bay to commemorate the alliance of France and America in the War of Independence. We have classic evidence that the Colossus of Rhodes measured about 105 ft. high; the colossal figure of San Carlo Borromeo on Lake Maggiore is only about 3 ft. higher. The American figure of Liberty is to be no less than 137 ft. in height from its feet to the extremity of the torch in its right hand. The work is now rapidly progressing, and the completion is promised for the end of next year. The portion which is set up reaches above the knees, over 38 ft. As may be imagined, in the execution of so gigantic a work the difficulties to be grappled with are not a few. In addition to the large number of models which have had to be made by the artist himself, a huge framework, a skeleton of the figure has had to be built up, this requiring, as may be imagined, a scaffold of no small dimensions. Over the framework is laid a thick layer of plaster, to which again is attached, in pieces, the model cut in wood across the grain, so as to enable the bronze plates,—of which the figure is to be built up,—to be hammered, while hot, to the requisite shape; the plates, 2½ millimètres, about 3-32 of an inch thick, being eventually riveted together. This method has been adopted in preference to casting the figure in bronze, from motives of economy. According to Pliny, the famous Mercury of Zenodorus,—a colossus some 110 ft. high,—and which gave its name, it may be mentioned, to the Colosseum of Rome, cost some forty millions of sesterces, hard on 160,000*l.* of our money. M. Bartholdi reckons that the expense of his figure will not exceed 28,000*l.* The proceeds of a most successful lottery have already covered any possible contingencies. The statue completed, its power of resistance to the wind having been taken fully into account, it will be set up on a pedestal about 165 ft. high, erected by the Americans. Some idea, therefore, may be formed of the feature the figure is likely to be in New York Bay. With the huge suspension Brooklyn Bridge spanning the North River on one side, and on the other the figure of Liberty on Bedloe Island off the Battery, New York Bay will be a sight to be seen by the lovers of the extraordinary.

It was one of the wishes dearest to the heart of Garibaldi to see the Roman Campagna reclaimed from its uselessness and danger to the health of the capital. The work promises slowly to progress. Within a short time the municipality of Rome have published the report of Dr. Giuseppe Pinto on the hygienic position of Rome and the surrounding *campagna*. "At the moment of proceeding to the great hydraulic work of draining the Roman *campagna*, and improving the hygienic condition of the capital, one of the first operations to be undertaken," writes the Doctor, "is to drain the valley of the classic Almo, on the Via Appia, at about 500 paces from the Porta San Sebastiano. Without this preliminary and useful work, it is scarcely possible to hope for the development of the neighbourhood of the Aventine. The sum set down in the budget, 65,000 lire (2,600*l.*), for draining the basin of the Almo is insufficient. The general hydraulic works and partial replanting once executed, then habitable centres can be established. It is the political aim of Rome, as the capital of Italy, says Dr. Pinto, that the malaria, the result of causes more accidental than natural, should disappear, and the environing country become inhabitable during all seasons of the year, in order that the commercial and industrial existence of Rome may no longer suffer, and that the vital movement of the nation towards the capital should in no way be compromised.

The Architects' and Engineers' Congress, to be held in Rome, in December next, has been announced in these pages, and, as has been stated, the new National Gallery of Modern Art will then be thrown open, if not indeed earlier. The King of Italy signed, not long since a decree, establishing the institution. It is to be situated,—of all appropriate places in the city of so many artistic memories,—in the Thermes of Diocletian, so familiar to all Romans as the cloister of Michelangelo, overshadowed by the picturesque cypresses which are almost the first feature the stranger remarks on arriving in Rome by its modern entrance, the somewhat prosaic but handsome railway-station, round which the new life of the Italian capital is now centreing. A sum of 100,000 lire (4,000*l.*) is to be devoted annually to the purchase of works of contemporary artists. In spite of the existence of our Chantrey fund with its equal sum, when are we in England to own a modern National Gallery such as the French possess in their Luxembourg, the Belgians in their new Palais des Beaux Arts, the Germans at Berlin, the New Pinakothek at Munich, and now the Italians in Rome?

On Thursday in last week was opened at Paris, in the Palais de l'Industrie, the seventh biennial exhibition of the Union Centrale des Beaux-Arts. The exhibition this year is, as we announced some time since, specially devoted to tissues, wood industries, books, and printing. As previously, there are two distinct sections,—the modern and the retrospective, this latter containing a most characteristic and valuable series of loaned objects. We hope, at a later date, to be able to speak at some length of this exhibition, which is of exceptional interest.

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HYDE PARK CORNER IN PARLIAMENT.

Although the debate on this matter on Saturday last, initiated by Lord Elcho, terminated in the agreement of the Committee of Supply to the preliminary vote of 3,000*l.* for reconstructing the reservoir now in the Green Park on another site, we hope the matter is not yet to be regarded as settled, especially as the last speaker on the occasion, Mr. Warton, pointedly suggested the desirability of giving more consideration to the subject. Other schemes besides the official one may require the removal of the reservoir; though the objection made to that vote, that it was asked for without the slightest indication as to where and in what form the reservoir was to be re-erected, was a perfectly pertinent one. The whole action and spirit of the present First Commissioner of Works in this and other matters call for very decided interference. We have had a great deal of mischief done by predecessors in the office, but we have hardly had any one who seemed possessed by such determination to thrust his schemes upon the public on the strength of his own confidence in their excellence, and to chop and change things at his own pleasure.

It is a pity that the opposition raised in the House to the scheme in question, and the rival scheme proposed by Lord Elcho, presented very weak points which could not but afford scope for effective reply. Lord Elcho made the mistake of proposing far too much, and of unnecessarily moving the park screen, just as the First Commissioner unnecessarily removes the Wellington Arch,—the removal being in each case to a less effective position. Lord Elcho should have left all that alone, and confined himself to pointing out how the traffic could be inexpensively relieved by continuing Hamilton-place under the angle of Constitution-hill,—a scheme which, as has been pointed out by a correspondent in our own columns, is perfectly practicable. Lord Elcho's plan also showed this feature, and that is the only one in his plan which really bears on the main point in a practical sense. His road, however, is very poorly laid out, in no regular curve of any kind, and, therefore, even in regard to this part of the scheme, his plan did not show it to the best advantage. It is exceedingly unfortunate, too, for the Institute of Architects that they should have gone into opposition in a manner which left the First Commissioner so many points open for retorts, which we will not recapitulate here, being bound to maintain a certain *esprit de corps* in regard to the only representative body of British architects, but which we cannot say we think were unreasonable.

That, however, is beside the real question. We will merely notice the points in the First Commissioner's reply which require notice. He referred to the old scheme for making a tunnel under the Green Park from Hamilton-place to Constitution-hill as unsatisfactory. Tunnels are always unsatisfactory in such a case; we only refer to the point because a good many persons seem to have confounded this "tunnel" scheme with what we may call the "bridge" scheme which we have referred to, and they have imagined that this was only the tunnel idea revived. There are, if not "insuperable difficulties," at least insuperable objections to the tunnel scheme, but there are no insuperable difficulties, and hardly any difficulties at all, in making a road over which Constitution-hill can be carried on a bridge. The First Commissioner said it was a condition for relieving the traffic that the arch should be removed, because otherwise Grosvenor-place could not be widened, which was necessary in order to relieve the block. It has been pointed out already that Grosvenor-place could be widened for carriage traffic by the width of the footway adjoining the arch, which could easily be removed by providing another foot-passage leading up to Piccadilly by the east side of the arch; and certainly it is an easier and simpler thing to move a footway than to move the arch. But the widening of Grosvenor-place is not the essential point. It is astonishing that it should be necessary to point out that the block at Hyde Park Corner simply arises from the fact that for the space between Hamilton-place and the arch, all the north and south traffic is turned along the east and west route. That is the whole difficulty about which such mare's nests have been made: and the only thing wanted to relieve it is to get the north and south traffic off that piece of road, on which it has, by common sense, no right to be. That can be attained by continuing the road in its proper direction and running it under Constitution-hill, and the whole of the First Commissioner's big job of pulling down and re-building will not do one thing more to relieve the carriage-traffic than that simple plan would effect. But what about the unfortunate foot-passengers? The matter seems to have been looked at entirely from the point of view of people in carriages. If this Government scheme is carried out, all the thousands of foot-passengers who daily traverse Piccadilly east and west will be put to inconvenience, delay, and even danger, for perhaps generations to come. Let any one who has the capability of realising the effect of traffic on a plan look at the official plan, and say if this must not be its inevitable result. This seems to have escaped the notice of Lord Elcho, who might have made a far more effective point than any in his speech, if he had brought forward this serious and perfectly avoidable public inconvenience which is to be inflicted. Such matters seem to be beneath the consideration of the Office of Works, but the fact will be discovered and will become matter for serious and continued complaint if the scheme is carried out.

As to the injury to the effect of the arch in its proposed new position, the authorities seem to have no more clear idea about that than about the inconvenience that will be inflicted on foot passengers. What no one seems to realise is, that the arch will be shunted downhill, and that it will stand on the side of a slope with the ground higher on one side of it than on the other. These would be strong objections in any case; they are stronger when the removal is shown to be quite unnecessary. And no one who understands the feeling and *motif* of Classic architecture can possibly doubt that the arch standing opposite to and parallel to the Hyde Park screen makes a far better grouping,—the two objects flanking the main roadway into London, and mutually assisting each other's effect,—than if the two were entirely dissociated from one another. The First Commissioner quoted Mr. Street's authority to the effect that the arch would not be impaired in appearance by the proposed removal. If he had quoted Mr. Street in regard to some question about the treatment of one of our cathedrals, we could have understood it. That Mr. Street had any claims to be considered in any special degree an authority on Classic architecture, or on the laying out of sites, we certainly did not know. How much the judgment of those who are forcing on this matter on the general question of taste is worth, may be surmised from the fact that it was deliberately proposed to put the equestrian statue up again, after rebuilding the arch, and thus to make over again one of the silliest blunders that has ever been made in such matters. This intention, however, we are glad to hear, has been abandoned.

It is the assertion of the First Commissioner, upon which he has more than once laid stress, that his plan had "given general satisfaction" to the members of the House and to the press. In regard to the latter point, we have observed that the opinion of the daily journals is by no means unanimous: one important evening paper, for instance, more than once condemned and protested against the plan in the strongest terms; and we ourselves might, perhaps, be excused for thinking, without vanity, that the opinion of a journal especially devoted to architecture was of considerably more weight in regard to such a subject than that of a whole mass of general daily papers, the writers in which rarely even endeavour to understand matters of this kind. How much their opinion is worth on the present subject may be judged from the ridiculously inaccurate way in which the discussion was reported in some of them, in which various schemes were all mixed up and confounded together, while one paper spoke of the statue and the arch as being "no doubt only too well fitted for each other," quite unaware that the arch was the work of an eminent and cultivated architect, which had been nearly ruined in its effect by a bad and disproportionate statue never intended for it. The members of the House, whose "general satisfaction" is quoted, do not as a body know much more about such matters than the newspapers; and it is certainly significant that the only architect who is a member of the House, Mr. Peddie, expressed decided disapproval of the scheme; so that there are very important deductions to be made from the First Commissioner's claim to have given general satisfaction. We shall, at all events, endeavour to promote a wholesome dissatisfaction with his scheme, — with the greatest respect for himself personally, — as long as it seems of any use to do so.

We give elsewhere some notes of the discussions on the subject which have taken place in Parliament during the past few days.

FOREIGN PICTURES.

It seems but a few years ago that the London picture season was said to commence with the opening of the Royal Academy on the first Monday in May, and to end with the close of that august institution, in the last week in July. In those days, about thirty years ago, the exhibitions that lovers of pictures looked forward to were the Royal Academy at Somerset House (and a little later in Trafalgar-square), the Suffolk-street Gallery, as it was and still is called, the Old and New Water-Colour Societies, and the annual exhibition of the collected pictures purchased by the Art-Union of London. These exhibitions, with the addition of now and then some Bond-street or Egyptian Hall show of a characteristic work by a popular painter, composed the whole of the summer artistic attractions, until later in the year the British Institution in Pall-Mall opened its doors to the lovers of old art, when such collections were offered to their inspection as have ever since, to those who recall them, seemed the greatest artistic treats in their memory. It is true that most of the treasures many remember to have seen at the British Institution have since been shown to the younger generation at Burlington House, and not a few, owing to the liberality and patriotism of our collectors, are now hanging on the walls of our National Gallery.

At the exhibitions of modern art in the past we had to be content with the works of English artists alone. It was very rarely that the work of a foreign painter found a place in our London public galleries, and the mass of lovers of art in England were scarcely in any degree familiar with the work of modern foreign artists. Indeed, it may be said that this year's picture season has been the first to really familiarise the London public with foreign art, and in all conscience we must admit that there has been no lack of means of acquiring that kind of information. Not only has the past picture-season been characterised by the number of foreign pictures that have been exhibited, but by what may fairly be said to be the extraordinarily high prices that have been realised by works of art. In this respect, it appears that season after season adds something to the commercial value of certain pictures, and notwithstanding startling prices that we have for years heard of as given for the works of famous masters, we have almost reached a point when we cease to be surprised.

Certainly it may be said that the interest of the past picture season has chiefly centred in the great acquisitions made by the nation at the Hamilton Palace collection sale, of more than a dozen choice works by the great old masters. But markedly characteristic in our modern English art is the absence in any of our exhibitions of any strikingly representative picture, excepting always the fact that a great English portrait-painter has again shown to the world the ability of the English school to assert its traditional supremacy in this direction.

The collection of Mr. Watts's works at the Grosvenor Gallery has been another feature of the past picture season. We have more than once in these pages spoken in praise of the practice of gathering together the works of single painters, as being so advantageous in obtaining a correct appreciation of the merit of the artist, and we are happy to find the practice spreading. The collected works of the late Mr. Palmer afforded a great treat to the lovers of landscape art, and there have been several other collections of almost equal interest, not the least of which has been that of Miss North's floral studies at Kew, which she has generously presented to the nation and,—important point,—thrown open to the public on Sundays. We are happy to see that this charming artist has just departed for another floral tour in pursuit of her beloved art. For the first time in the history of painting the American artists have made a decided mark out of their own country, Mr. Sargent's Spanish pictures, of which we spoke in reviewing the Paris *Salon*, not only

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being exceedingly fine, but promising much more from so young a painter; and there are several others of his countrymen whose works, if less fascinating, may obtain an enviable fame in this country.

It would occupy considerable space to merely enumerate the commercial exhibitions in Bond-street, the neighbourhood of St. James's-street, and the City, that have occupied the attention of art-loving people during the last picture season; and those who have a taste this way, and may have simply followed a fashion, have been able to become familiar with the works of foreign artists unknown to many of us until this year. To all greatly interested in pictures, the lovely landscapes of Corot and of Diaz have long been familiar. It is not alone the works of such men as Corot, Meissonier, Millet, Dupré, Frère, Gérôme, and a few other names that have long been before the world, but we have this year seen, almost in perfection, the modern Italian school, the works of Signor Costa, Francesco Vinea, and a number of others, and we have been made more familiar with the French painter De Neuville. We have had opportunities of seeing not only the works of M. Munkacsy,—they have certainly been sufficiently advertised, — but the works of Knaus, of Vibert, of Bréton, of Vautier, and a host of other foreign artists, many of their pictures now reposing in our country, and others that have been seen on their way to adorn the palaces that are rapidly springing up in America.

It cannot be said that one is tired of the artistic pressure that has been brought to add to the weight of our amusements, but it is not difficult to foresee the possibility of too great an amount of increase in this direction. If we are to have more, or even as many, foreign pictures to amuse us and to excite our love of accumulation, it certainly seems to suggest the possibility that our English artists might perhaps with reason be disposed to complain. Whether they do so or not just now, must surely be owing either to a contentedness in their own prosperity or an amount of courage in disregarding rivalry that we hope is sufficiently well founded. That the American painters, at all events, do not rest quite so complacently in this respect, is shown by their seriously discussing just now the desirability of taxing at so much the square inch (!) all imported pictures, on which already very heavy duties are laid, but although in a country like England, advocating, as so many of us do, the fullest exercise of free trade, we are not likely to tax the introduction of foreign art, yet certainly English painters have to look at least to their laurels, if in their comfortable security they have no fear for their pockets.

FROM CHRISTCHURCH BAY.

Referring to our description of the coloured decoration of the Church of St. Nicholas, Guildford, which, as we are told, excited much interest in the locality, a correspondent writes to us from Bournemouth, to call attention to the fact that the stone capitals in the chancel of the noble priory church of Christchurch, Hants, are painted, and that of the very same colour and tint with those recently so treated at St. Nicholas. Nor is this a comparison of minor importance. Christchurch, among its other rare peculiarities, possesses that of unusual precision of date. Not having been utilised as a cathedral, the stalls and misereres in the chancel are now,—allowance being made for natural decay (which has been somewhat more rapid on the north side of the choir, which is exposed to the full heat of the sun, than on the south side, which is sheltered from the rays) just as it was when the monks went out. We do not at this moment remember another church in which that is so remarkably the case. On the other hand, the Late Perpendicular style of the choir, not in the roof and clearstory of the chancel alone, as at Christ Church, Oxford, but down to the very woodwork of the stalls, shows that this portion of the edifice cannot have been very long built before it ceased to be used as a monastic church. Thus it is not to be imagined that the bosses in the stone roof, or the capitals of the lofty columns, have been retouched since the Tudor times, and it is sure that in those times the colour must have been fresh. It is now in some places faded, in others more or less bright, especially the gold. But in the cavetto mouldings of the capitals, where the sun when at the hottest can strike with only an enfeebled power, the colour is in some cases so full as to be yet evidently what it was originally intended to be. And here, as before observed, the tint is identical with that employed by Messrs. Clayton & Bell.

An architectural rarity, which may justly claim the title of a bijou, looks down on Christchurch from the wooded summit of the northern side of the bay. This is Highcliffe, the seat of Louisa, Marchioness of Waterford, which was built by her ladyship's father, Lord Stuart de Rothsay. This building is in some sort a permanent museum; as exquisite specimens of French or Flemish work, bought by the noble builder abroad, and set in his own work, adorn the edifice. There is a projecting oriel window carved in Caen stone, which was bought in Rouen, numbered stone by stone, taken down, transported and re-erected at Highcliffe in a gable end designed expressly for the setting of it. Again, a sort of curtain connecting two re-entering angles of the building, has a parapet of pierced stone, formed by old letters that make an inscription, each letter standing out against the foliage that casts a green sheen through the apertures.

It is a satisfactory piece of intelligence, as regards the safety of this charming mansion, that one of the fierce storms of the present year broke through the bar which the confluent rivers Stour and Avon have formed parallel to the beach, behind which the water ran for some mile and a half or two miles from its proper mouth, as if with the express intention of undermining the cliff which bounds the Highcliffe estate. This danger, by no means an imaginary one, is now no longer menacing. But what an idea does it give of our river conservancy, or rather of the absence of any such provision, that this mischievous process should have gone on unchecked for so many years, with the further results of heading up the floods in the river valley, and preventing their natural outfall into the sea, to the great loss and damage of the farmers.

MELROSE ABBEY.

In connexion with its recent meeting at Carlisle, the Royal Archæological Institute visited Melrose Abbey, where Mr. Kerr read an interesting paper descriptive of the history and architecture of the buildings. In the course of his observations he said that the name indicated the original appearance of the locality, being composed of two Gaelic words, Mull and Rhoss, or Ross, signifying a bare promontory. The name was formerly spelled Mulross, now Melrose. The site was formed by the winding of the river Tweed through a narrow valley with rising grounds on either side. The locality had been distinguished from an early period, as it abounded in ancient remains of Roman buildings, ecclesiastical and baronial structures, cairns, and tumuli indicating the site of feuds and more formidable conflicts. In drawing attention to the abbey buildings he would remark that where they now stood was not the site of the original monastery of Melrose, which was situated at old Melrose, nearly two miles further east. The site was still pointed out as the Chapelknowe, but not a vestige of the buildings remained. Some carved red stones were dug up there a few years ago, indicating that the more recent buildings were in the Norman style. In the earliest period Bede stated that the churches were all of oak and thatched with reeds. The old abbey was supposed to have been founded towards the end of the sixth century, and afterwards dedicated to St. Cuthbert, its third abbot. It continued to be recognised as an abbey till 1136, when the present one was founded; afterwards it was referred to as St. Cuthbert's Chapel. The early ecclesiastics were Culdees, who existed up to the middle of the twelfth century, when they were merged into the Austin Canons, the order which they most resembled, and were afterwards only noticed occasionally until about the middle of the fourteenth century, when they finally disappeared. The present abbey was considered to have been a new institution, founded by David I. in 1136. None of the buildings of the period, if they did exist, could be identified, and it was probable that they were not so extensive as the subsequent erection. The Abbey of 1136 was ten years in building, and according to the "Chronicle of Mailros," was dedicated to St. Mary in 1146. It was colonised by monks of the Cistercian order from Riévalle, in the North Riding of Yorkshire, who were the first of the order introduced into Scotland, and continued as its head while it existed in this country. The "Chronicle of Mailros" was begun by the order establishment in 735, and continued down to 1270. The remains before them appears to have belonged to buildings erected after the demolition of David I.'s structure in 1322. Between this date and 1510 the present abbey had arisen which continued the Cistercian arrangement. There was one exception here to the general rule, by placing the garth or cloister court upon the north instead of the south side of the church. There were, however, examples of this deviation in England, as at Gloucester, Dore, St. David's, &c. It had been remarked that it was difficult to trace the progress of the styles of Scotland, on account of the sudden transitions that existed occasionally in the same building; but this was readily accounted for, from the frequent destruction of these during the inroads from England. The church presented unity of interest throughout, and as religious teaching and education was committed to its care, it became necessary even for the church's existence that her establishments should be placed in an efficient state as early as possible. The buildings were, therefore, restored according to the best examples, whether in style or arrangement. If the political situation of this country was such as to admit of architects, or master masons, being got from England, English features appeared; but if not, these were obtained from France. Thus they had in Melrose work of English character up to 1385, when the abbey was partially destroyed by Richard II., and from this period until 1510 the work in some places showed indication of French feature. He described the extent of property, which was large, which attached to the abbey, and other matters. Along with the decay of the reputation of the monks, from their indulgence in luxury and the grosser propensities, the abbey suffered many reverses, amongst the most prominent being its destruction in 1322 by Edward II. In 1385 it was burned by Richard II., and in 1545 it was literally destroyed, with the best of its outlying buildings, by the Earl of Hertford. To secure a portion of the nave to be used as a parish church the plain buttress and sub-vaulting (which they saw) were introduced into other fittings in 1618, and continued in use till 1810. He pointed out various interesting architectural features of the ruins, and exhibited a drawing of a restoration of the grand east window. Around were the graves of several persons whose names appeared in history. Upon the south side is the grave of Alexander II., upon the north the graves of the Douglases,—"the dark Knight of Liddesdale, and the hero of Otterburne." In the small chapel to the south of the altar is the grave of Sir Ralf Evers, and nearest the wall that of Sir Bryan Latoun (sometimes said to be that of Michael Scott, the wizard) who were killed at the battle of Ancrum Moor in 1545. At the entrance to the cloisters is the burial-place of the house of Yair, and opposite to it are the graves of the Kerrs of Keppilaw. The remainder of the paper was descriptive of particular features of the ruins.

Mr. Micklethwaite followed Mr. Kerr and spoke on the ecclesiastical and other aspects of the subject. Pointing to the rich and elaborate carvings of various parts of the ruins, he said it was an extraordinary place for the order of Cistercian canons, who in their churches aimed at being plain. He described the subsidiary buildings, and from the chancel pointed out the doorways in the transepts and aisles, and described the buildings into which they led. In the guide-books the positions of the nave and choir had been reversed. The choir was really on the other side of what was said to be it. In the exterior view of the east window there were two figures which were said to be those of David I. and his Queen Matilda. He did not think the figures were correctly described. His opinion was that the figures represented the crowning of the Virgin.

Glasgow Municipal Buildings. — The authors of the design bearing the motto "Gauntlet," one of the four specially selected in the final competition of ten, are Messrs. Thos. Worthington & J. G. Elgood, 110, King-street, Manchester.

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SPECIAL LEGISLATION FOR THEATRES IN AUSTRIA.

The Commission appointed by the Governor of Lower Austria, and consisting of official representatives, architects, engineers, and scientists, which, in the first place, had to suggest measures of safety, upon the adoption of which by theatrical managers the granting of official licences to them was made dependent, have now also completed the second portion of their task. They have drawn up a set of regulations indicating the general conditions for the construction, arrangement, and working of theatres. Valuable material had been submitted to them in the form of opinions of engineering, architectural, and sanitary authorities, as well as numerous propositions for the prevention of fires in theatres, and foreign rules and regulations. On the basis of the resolutions passed by the Commission, the Governor of the province has published an order which deals with the question under seven different heads: 1, Conditions of construction; 2, the arrangement; 3, the working; 4, facilities for the construction of small theatres; 5, inspection of theatres; 6, theatre safety commissions (local and provincial); 7, general regulations. Under sections 1 to 6, it is ordered that new theatres are to be isolated, and erected at a distance of not less than 50 ft. from other buildings. The stage must be separated from the auditorium by a wall 2 ft. thick throughout, reaching from below the orchestra floor to above the roof, and having, besides the proscenium opening, only one means of communication. A vaulted corridor, at least 8 ft. 3 in. wide, must run round each tier of the auditorium, from which the public may leave by straight stairs leading to the open air. Every tier must have separate stairs on each side, and the stairs of the various tiers must not communicate with each other. Great stress is laid upon the point which deals with the impregnation (with uninflammable substances) of all objects on the stage,—furniture, decorations, &c. Sections 5 and 6 deal with the introduction of such rules as are necessary for continuously controlling the complete carrying out and permanent application of the conditions imposed. The control includes daily inspection by the building and fire-brigade authorities of the police; the appointment of local committees of supervision, who have to examine existing theatres periodically, and to report thereon; and, finally, the appointment of a provincial commission, acting with the provincial authorities, and exercising a continuous control by periodical examinations. In order to give full force to the above regulations, a special Bill is to be submitted to the Lower Austrian Landtag at its next session, which is intended to rectify existing defects.

THE AMSTERDAM EXHIBITION OF 1883.

The establishment of direct water communication with the North Sea has done much to restore to the Venice of the North the marine supremacy it enjoyed in the times of Dutch commercial supremacy. This return of Holland to a more important mercantile position than she had occupied of late years is being celebrated by an International Colonial Exhibition, which bids fair to take its place amongst the most comprehensive and interesting of those displays as yet witnessed.

The fact that the official journal has already made its first appearance indicates that the exhibition is intended to be something more than a mere show, and that it will to a certain extent partake of the nature of the special exhibitions and congresses which have done so much towards the development of industrial art in England and upon the Continent. Important traffic facilities both by sea and land have been arranged for.

According to the official announcements already made, this exhibition is intended to follow in the wake of those of London, Paris, Vienna, Philadelphia, Sydney, and Melbourne, but special prominence will be given to colonial subjects. The following is the general plan of the undertaking.

1. The Colonial portion (which forms the basis of the exhibition), in which the different systems of colonisation and of colonial agriculture, as well as the manners and customs of trans-oceanic countries, will be shown. Their industrial progress will also be illustrated and an attempt will be made to delineate what still remains to be done in the way of commerce and industry. Colonial *flora* and *fauna* will also be represented.

2. The export trade will be dealt with in a very comprehensive manner. Under this head will be grouped illustrations of many industrial processes in connexion with the transformation of raw materials into finished products.

3. Works of art from the most ancient times will be gathered together with a view of constituting an instructive *ensemble*, showing the ideas which have been developed in the succession of nations under the influence of civilisation. In this manner the comparative study of the fine arts at different periods and amongst different nations will be materially facilitated.

4. Temporary exhibitions (which have of late years done so much in the cause of art and industry) will form important features of the Amsterdam scheme. They will have special reference to horticulture, agriculture, &c., and Holland will itself contribute in a large measure to the expected success of this branch of the exhibition.

5. With an intelligent appreciation of the special advantages the conjuncture affords for scientific and artistic congresses, prospective arrangements have been made for *réunions* and conferences on subjects affecting education, arts, sciences, hygiene, political economy, international jurisprudence, and in which men of distinction in various branches are expected to take part. Colonial economy (as regarding the relations of colonies with the mother country) will form a prominent feature of discussion.

Nine galleries of the principal building are already built, and special attention is now being given to the portion of the exhibition in which the greater part of the machinery will be placed. The support of the various nations of the world which have been invited to take part in the display promises to be on a scale fully commensurate with the activity and intelligent energy shown by the administrative council.

PALACE OF COUNT DON PEDRO ANSÚREZ AT VALLADOLID.

Valladolid is commonly called the City of Don Pedro Ansúrez, and from this circumstance some are led to infer that this nobleman was the founder of the city. Authentic accounts, however, do not bear out the correctness of this supposition, for the existence of Valladolid can be traced to times anterior to the reign of King Alfonso VI. But Count Ansúrez, who enjoyed the protection of the king for his attachment during the persecutions carried on by his brother, Don Sancho, received the city as a reward for his services, and improved and embellished it in such a manner that he acquired the reputation of being the founder of that splendid city. Don Pedro and his wife, Dona Elo, erected several magnificent edifices. Among these may be cited the cathedral, Nuestra Señora de la Antigua, San Nicolas, and the bridge over the Pisuerga, as well as the palace in which they resided, and part of which we illustrate in this week's *Builder*. The palace, which stands on a site formerly outside the ramparts of the city, has now been converted into the hospital bearing the name of Santa Maria de Esgueva, and forms one of the most important features of Valladolid. Count Ansúrez is buried in Valladolid Cathedral, and his tomb bears the following pathetic inscription:—

> "The lives of the departed
> Admonish the living;
> But such is the change of the times
> That the mere mention of the dead
> Is offensive to the living generation."

CHÂTEAU AT HYÈRES.

This château stands upon an eminence two miles from the town of Hyères, and commands a magnificent view of the Mediterranean. It consists of three reception and six bed rooms, with dressing and bath rooms.

It is built of local stone, with freestone dressings, from quarries near Toulon, and is fitted internally with pitch-pine.

It is surrounded on three sides by a broad verandah, and has every modern English appliance.

The builders are MM. Bosquet, from Marseilles, and the clerk of works is Mr. Gilling. The architects are Messrs. W. G. Habershon & Fawckner, 38, Bloomsbury-square, London.

THE COMPETITION FOR THE HOUSE OF THE GERMAN IMPERIAL PARLIAMENT.

HERR WALLOT'S DESIGN.

With the present number of the *Builder* we present our readers with the ground-plan and a perspective view of the design of Herr Paul Wallot, a Frankfort architect, who gained one of the two first prizes in the competition for the new Imperial House of Parliament in Berlin. The Parliamentary Commission charged to provide a house for the Imperial Legislature has already made a definitive choice of Herr Wallot's design, and has appointed the successful author as architect of the new edifice. Herr Wallot's plan, however, before being carried out, is to undergo some changes and modifications derived partly from some of the other successful designs to which the Committee have awarded prizes, and partly from others which they have subsequently purchased. In its main outlines, nevertheless, the future House of the German Imperial Parliament will be a reproduction of Herr Wallot's plan, the modifications desired not being of any considerable extent. Before proceeding to any special remarks upon the successful design, we may permit ourselves some general observations, on the result of the competition. We may premise that we published in the columns of the *Builder* at the time the competition was announced a complete translation of the programme, including the conditions of the contest, the dimensions of the site, and a full catalogue, with dimensions of the rooms required in the new building. One of the principal difficulties of the problem, it will be remembered, was the contracted site which had been fixed upon. One side of the edifice was to face the Königsplatz, which has become one of the most interesting spots in Berlin since the erection of the Column of Victory in its centre in celebration of the triumphs of the German arms in 1870 and 1871. In the new Parliament House it was one of the conditions that the chief entrance should not be on the Königs-platz side, but on one of the other three sides nearer the city. The site of the new House is about 200 yards to the north-west of the Brandenburg Gate, which terminates the celebrated avenue, Unter den Linden. One side of the Königsplatz is formed by the open border of the well-known park, called the Thiergarten. On another side is Kroll's Theatre, and opposite this is the site chosen for the new edifice. There is no doubt it is one of the finest and most suitable spots for the purpose which could have been chosen within the enlarged precincts of the German capital. The Königs-platz, we may parenthetically remark, is destined, at some future period, to have erected upon one side of it, - we believe that now occupied by Kroll's Theatre,—a new palace, as the principal town residence of the new line of German emperors, an addition which will make it vie with the Lustgarten as the finest square in Berlin.

For the competition for designs for the new German Parliament House only the short space of three months was allowed. But the premiums were, for Germany, numerous and liberal,—two first premiums of 750*l.* each, three second premiums of 500*l.* each, and five third of 250*l.* each (see *Builder* of June 24th last),—the result being that an unprecedented number of competitors took part in the contest. The total number was 189, and the number of sheets of drawings sent in was upwards of 2,000. They were on view from the last week in June to late in July, and were exhibited at the Provisional Gallery of Fine Arts in the Cantian-platz, Berlin, where they were daily visited by architects and artists from all parts of Germany as well as by crowds of the general public of the capital. One result of the competition has been to call out a host of young architectural talent previously without distinction, the two first-prize takers being comparatively young men, and most of the others being by no means amongst the hitherto best known names amongst the architects of Germany. Speaking generally, the native critics are well satisfied with national progress evinced by this competition. Compared with the 1872 competition, the recent contest shows that German architects have, in the interim, without losing anything in the way of taste and learning, become more practical. In the former competition the prevailing failing as to the designs was that they sacrificed internal propriety and prac-

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tical adaptation to the end in view to external effect. The idea then aimed at was, less to provide the Legislature with the most convenient house of business than to present to spectators a splendid monumental edifice. In the present year, while exterior effect has not been lost sight of, the internal arrangements, as evidenced in the ground-plans of Herren Wallot and Thiersch and many other competitors, are a vast improvement on the great majority of the designs delivered in the competition of ten years back.

Among the designs sent in this year there was but a very small percentage in the Gothic style, and not one of them gained a prize or any other distinction. The majority of the designs were in the strict Renaissance style, many of them enriched by motives derived from the German variety of that style. Few were in the more pronounced German-Renaissance style, nor were there many following strictly Hellenic forms. In nearly all the designs stone was the material chosen, the number preferring brick facings being very few.

In a Parliament House all other parts of the plan are, as a matter of real value, subordinate in importance to the hall in which the legislators sit to debate and make the laws. To give some external expression to this fact appears an æsthetic necessity, and this necessity should guide the architect in giving a monumental character to the edifice. The hall of session should, in fact, make itself in some form apparent in the external configuration of the building, and this has, in fact, been done in most cases by the competitors in the recent contest. The general solution has been found in surmounting the hall by a more or less lofty cupola. In some instances temple pediments, or pyramidal and terrace-like structures, have crowned the principal hall of session; in others we find towers and spires and other more fantastic shapes. By far the most common crown to the edifice, however, has been the cupola; both the cupola properly so called, and those forms consisting of a low pavilion or tower with tent-shaped or imperial roof, and with or without tholobate, &c. So afraid, however, were many of the competitors of going to excess in the monumental direction that their cupolas or other forms of crowning structure over the Hall of Session err in the opposite direction. They are too modest and too low, and do not stand out with sufficient prominence in comparison with the rest of the building. There are not wanting examples, however, of excess in the contrary direction.

The winner of the first premium, Herr Wallot, was the most successful of all the competitors in his cupola over the Session Hall, and his success with the jury was, in fact, largely due to the ingenuity he displayed in the solution of this portion of the problem. Herr Wallot proposes to build over the Hall of Session a lofty but open structure, so that the light can fall without hindrance through the sides upon the overhead lights of the Session Hall. By this means the House, which in Germany always sits in day time, obtains an excellent overhead light without the objectionable zenith light. Upon the open walls Herr Wallot constructs his dome-like curved roof,—a novelty which has been called a monumental baldachin or canopy. The way in which Herr Wallot has performed this part of his task is very original, and has won for him much praise with German critics.

The design of Herr Wallot was placed first amongst the completing plans by the almost unanimous vote of the jury. The critics who have seen the exhibition of the whole of the designs at Berlin have in general endorsed this verdict. This unanimity is due, amongst other excellences of Herr Wallot's work, to his exceedingly successful ground-plan. The problem that had to be solved was one of no ordinary difficulty, considering the shortness of the time allowed, the very limited dimensions of the site, the number, variety, and peculiar requirements of the interior apartments, and the numerous other stringent conditions imposed.

In spite of the conditions laid down in the programme, Herr Wallot has in some points ventured on solutions not contemplated by the Commission, but whatever he did in this way has been approved by the judges. Instead of one chief entrance for members, as demanded in the programme, Herr Wallot has provided three, each with appropriate vestibule. Those on the north and south sides are for the regular business, while the third and principal one, facing the König's-platz, and which was called for chiefly by æsthetic considerations, the author has provided for grand ceremonial occasions. In the centre, between these three openings, lies a grand staircase, covered in with glass overhead, and leading into the great Ceremonial or Festival Hall. On both sides of the staircase-hall, on the ground-floor, are the postal and telegraph offices. In the south-west and northern wings, on the ground-floor, are committee-rooms and audience apartments. The central grand staircase affords a convenient and appropriate means of communication between the chief rooms and halls used by the deputies on the principal floor and the apartments on the ground-floor.

All the subordinate entrances to the house are from the east or Sommer-strasse side. Here are two large portals, which, while serving as carriage entrances, leading into the eastern courts, also lead to the staircase conducting to the Bureau, or business offices of the Reichstag, and intended for the use of the general public having business to transact there. On the other side they lead to the staircase to be used by the Federal Council, and conducting to galleries or *loges* used by the Court and the diplomatic corps. There are two other entrances in the projecting centre of the building leading to the staircases conducting to the galleries set apart for the use of visitors, the reporters and representatives of the press, and the members of the local Parliaments of the various German states. The writing-rooms of the official shorthand-writers, which are accessible direct from the Hall of Session, lie on the ground-floor, between the two last-mentioned entrances. The other rooms on this floor are for the records of the House, or for use as offices of the Bureau, or as apartments for the servants resident on the premises.

As regards the upper floor of the house, where it is not absorbed by the lofty halls of the principal floor, extending up through both floors, the most interesting portions are those connected with the galleries and *loges* overlooking the Hall of Session. Those on the southern and half the eastern side are for members of the press, those on the other half of the eastern side, as well as on the northern side, are for the members of the Federal Council and Reichstag, and for the Imperial Court and the Corps Diplomatique, while those on the western side are for the general public or "strangers." The writing-rooms for the members of the press and the accessory apartments connected with the Court *loge* are on the eastern front of the building upon this upper floor.

The merits of Herr Wallot's ground-plan, as we have already intimated, are not surpassed by any other design produced at the competition. The whole *ensemble* is symmetrically grouped about two axes, a longer and a shorter one, and the entrances and staircases are arranged so that every part of the house is easy to find and readily accessible. While the distribution of the interior and the application of the space at command are very advantageous, the architect has contrived at the same time to obtain from the conformation of the interior powerful motives determining the configuration of the exterior. With all this he has never lost sight of the main purpose of the building, but has subordinated external effect as well as internal arrangement to the one principal object, that of providing a convenient house for the work of legislation. In the matter of lighting Herr Wallot has provided four open courts in the interior of the edifice, each of about 14 mètres wide by 21 mètres long; and by this means, as well as by the fact that the house stands detached on all sides, every part of it is well supplied with daylight, which is the more important, as the German Parliament never sits by night. It is only in the central division of the building, which is 48 mètres wide, that skylights are applied, and the only case of indirect lighting is that of the corridors in the eastern wing.

There have been several objections urged against Herr Wallot's ground-plan. One of the principal defects in the eyes of German critics is the position assigned to the Ceremonial Hall. According to the programme, this was required to be next to the Hall of Session, the largest of all the apartments in the building. It was to be capable of accommodating several hundreds of persons, and was intended for the use of large conferences and for certain occasional festivals and solemn state ceremonies. By the position assigned to it in Herr Wallot's plan it will necessarily be in constant use while the House is sitting as a thoroughfare to most of the other parts of the buildings. It, therefore, lacks the seclusion which was contemplated in the original scheme. Some of the competitors have, in fact, made this ceremonial hall the centre and pivot of their entire ground-plan. However, in Herr Wallot's plan the large Refreshment Hall could easily serve all the purposes required in the Ceremonial Hall. Another objection is to the position of the Reading-room for daily and periodical literature. It will be this room and the refreshment department that members will most frequent when they are not in their seats in the House; and, according to most critics, the large Reading and refreshment rooms should be close together instead of being, as in Herr Wallot's plan, at a considerable distance from each other on different sides of the building. It has been suggested that the reading room (No. 36) shall change places with the Committee-room (No. 32), whereby this objection would be obviated. Further objections have also been raised against the position of the reporters' gallery, which is at the back of the seats of the members of the Federal Council, and to the unsuitable arrangement of the corridors connected with the cloak-rooms. In a climate like that of Germany, where heavy fur overcoats are necessary in the open air in winter, the cloak-room, we may remark by the way, is a far more important consideration in all public buildings than in the comparatively mild climate of England. Other objections are to the out-of-the-way spot in which Herr Wallot has placed the principal sitting-hall of the Federal Council, and to the entrance staircase for the Federal Council and Court, which are thought not to be in a sufficiently prominent position. However, the limited dimensions of the site are the principal cause of all these minor defects; nor is it possible to see how, under the circumstances, they are to be avoided. Moreover, none of the points to which exception has been taken in Herr Wallot's ground-plan are very serious drawbacks, and weigh as nothing against the prevailing excellences of the design.

The Hall of Session is, for acoustic reasons, to be fitted with a straight wooden ceiling. Below this, and above the arches of the *loges* overlooking the house, there is a rather high frieze. This the architect appears to intend to have adorned with paintings, but in case the light entering from under the cupola is insufficient, windows may, if desired, take the place of such ornamentation here.

As regards the exterior of the building, the illustration enables the reader to form a better idea of it than any amount of mere verbal description. Suffice it to say that the architect has succeeded in giving it a monumental character, but one which is more likely to charm and please than to startle or overawe the spectator. The best German critics agree that, in point of originality of character, the design of Herr Wallot surpasses all its competitors. The effect of the exterior is heightened by the cupola or dome with which the architect has crowned the Hall of Session. There appears no doubt that the form, at once imposing and charming, of this crowning point of the new German Imperial Parliament House is destined to be intimately associated with all representations of the capital of the German Empire in future.

Next to the cupola, the most prominent features in the façade of the new House will be the corner towers. They are to be 16 mètres square, and will rise to a height of 33·5 mètres, or about 110 ft., above the street level, the height above the main cornice of the building being 12·5 mètres, or about 40 ft., These four towers are of a purely ornamental character, and do not rise from any internal necessity in the structure of the building itself. They form, nevertheless, an indispensable feature in the façade of Herr Wallot's Parliament House, of which they are a very effective adornment.

The gainers of the two first premiums, Herr Paul Wallot and Professor Thiersch, are both comparatively young men, the former being under forty and the latter hardly thirty years of age. Singularly enough, whatever success they have hitherto had as architects has been in the city of Frankfort-on-the-Main. Herr Wallot was born at Oppenheim, on the Rhine. He received his professional education at the

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Berlin Bau-Akademie, and afterwards travelled for the sake of architectural study in Italy and England. Subsequently he settled as a private architect in Frankfort, and has there carried out a number of remarkable private edifices in the Zeil and other principal streets. In several recent competitions in Germany and Austria he has been a competitor, and his designs have invariably attracted notice. The other first prizeman, Professor Thiersch, is the nephew of the well-known Professor Thiersch, of Munich, who distinguished himself under King Louis I. of Bavaria. Herr Friedrich Thiersch, the successful competitor in the German Parliament House competition, studied at the Polytechnicum at Zurich, in Switzerland. He has erroneously been described as a pupil of the celebrated German architect, Herr Gottfried Semper. For several years after finishing his academical course, he worked practically in the office of Messrs. Mylias & Bluntschli, architects, of Frankfort. This firm has of late years competed in a series of prize competitions, and has been very frequently successful. In the preparation of these winning designs the young Herr Thiersch has always had a considerable share. In decorative work Herr Thiersch has more particularly distinguished himself, and the decorations of the new Frankfort Opera-house are chiefly due to him. For three years past Herr Thiersch has been a professor at the Munich Academy and School of Art, an appointment to which he was called on the recommendation of Professor Piloty.

On July the 16th Messrs. Wallot and Thiersch were entertained at a banquet by their colleagues and fellow-members of the Architects' Club and the Artists' Society, at Frankfort-on-the-Main. The festival was held in the grand saloon attached to the Zoological Gardens of the city, and was a great success. The two architects were congratulated on their success by Herr Lewald, the President of the Club, in the name of all the members. Each of them was at the same time presented with a gold laurel wreath and likewise with a diploma of honour. One of the speakers, Herr Viereck, expressed the universal sentiment of the Frankforters when, in winding up his speech, he remarked that, "It could not but be a proud feeling for this ancient Imperial city that it had been the lot of two architects trained within her walls to have supplied the best designs for the edifice which is destined to be the symbol of the re-established German Empire."

References to Plan.

1. Meeting Hall of the Federal Council.
2. Committee-room.
3, 4. Conference-rooms.
5. Cloak-room.
6, 7. Private rooms of the Chancellor.
8, 9. Heads of Imperial Departments.
10, 11. Private rooms of the President.
12. Secretaries' rooms.
13. Chief clerks' room.
14. Writing-room for the public.
15. Writing or ante-room.
16. Clerk's office or room for collating.
17. Conference-room.
18. Lavatory for members of the Reichstag.
19. Refreshment-bar.
20. Room attached to the restaurant.
21. Librarian's room.
22. Assistant-librarian's room.
23. Attendant's room.
24. Cloak-room.
25. Door for the Ayes and door for the Noes.
26. Press stairs.
27. Stairs for the public.
28. Stairs to the reserved galleries.
29. Stairs for the Imperial Court.
30. Stairs for the Federal Council.
31. Writing-room, reading-room.
32. Committee-room.
33. Restaurant.
34. Meeting-room.
35. Writing-room.
36. Reading-room.
37. Clerk's office.
38. Registrar's office.
39. For the public.
40. Cashier's office.
41. Hall.
42. Lobby.
43. Library.

Building By-Laws at Brighton.—A builder named Monckton was charged at Brighton with two distinct breaches of the Building By-laws, for permitting a new house in Havelock-road to be inhabited without giving notice to the Town Council that it was ready for occupation; and for neglecting to provide proper ventilation to the drainage. He pleaded guilty; but, as no penalty could be imposed under the By-laws in the first case, the Deputy Stipendiary convicted in the second, and fined the defendant 2*l*. and costs.

MODERN ENGLISH POTTERY.

Some short time ago the Council of the Society of Arts arranged an exhibition of Modern English Pottery at their house in John-street, Adelphi. They had not sufficient room to accept all the works offered, but a very fine selection was made, and it is to be regretted that it was not more widely known and visited than was the case. We give in alphabetical order the names of the firms, seven in number, whose works formed the exhibition, and we are enabled to supplement this list with representations of a few of the works sent:—

Messrs. T. C. Brown-Westhead, Moore, & Co., Staffordshire.

Messrs. Henry Doulton & Co., Lambeth Potteries, and Potteries, Burslem, Staffordshire.

Mr. John Harrison, Linthorpe Pottery, Middlesbrough-on-Tees.

Messrs. Maw & Co., Benthall Works, Broseley, Shropshire.

Messrs. Mintons, Stoke-on-Trent.

Messrs. Josiah Wedgwood & Sons, Etruria, Stoke-upon-Trent; and

The Worcester Royal Porcelain Company, Worcester.

Messrs. Brown-Westhead, Moore, & Co. exhibited two large vases of a fine ivory colour, upon which were grouped raised birds and flowers in gold and silver, of a remarkably realistic character. One of these vases we show.

Messrs. Doulton had three distinct exhibits. On the centre table were various kinds of Doulton ware, and on one side of the entrance was a collection of Lambeth Faïence and Impasto ware. On the other side, a collection of earthenware, made at Burslem, Staffordshire. We have before now described some of their processes, and were amongst the first to give encouragement to their early efforts.

In the hall were two large vases of Doulton ware on pedestals, standing altogether about 6 ft. in height. These were ornamented with incised animal groups, designed by Miss H. B. Barlow. There was also a large bowl and an elevated stand, of which we give a view.

The collection of Doulton ware may be divided under the following three heads:—1. Salt-glazed decorated stoneware; 2. Salt-glazed *pâte sur pâte*; 3. Silicon ware. The whole of these wares are subject to one firing only, and are fired in the open kiln.

There is very great variety in the first class. The decoration consists entirely of original designs, and, except in the case of pairs, no two objects are exactly alike. It is of incised, modelled, and applied work, and the treatment is both natural and conventional. The forms are also very varied, and vases, jugs, cups, and candelabra in many shapes were represented. Besides these, there were some small square panels in colours, with figure subjects illustrating fables, modelled by Mr. George Tinworth. In the second class, there were some specimens of *pâte sur pâte*, in which the decoration is produced by coloured clays or slips laid on, and modelled with the brush. It is, in fact, painting on the solid body with an earthy pigment. The third class, or silicon ware, is a new manufacture of considerable hardness. In the earlier specimens, the silicon ground is elaborately covered with a bluish applied work of simple design, as in the sample we illustrate, but a much more delicate result has now been obtained by the application of a *pâte sur pâte* decoration.

There was a large display of specimens of Linthorpe ware in vases, tazzas, flower-pots, card-trays, fruit-dishes, &c. These are varied in shape and tone of colour, but all have a rich glaze. The ornamentation is but slightly marked on the surface, and is chiefly obtained by shades of colour. There were, however, some plaques with a rough ground, on which were raised flowers. Linthorpe is a suburb of Middlesbrough-on-Tees, and the pottery was started on his estate at that place by Mr. Harrison a few years ago, chiefly on the suggestion of Dr. Dresser. The material is a common red-brick clay, and the artistic effects are chiefly obtained from the originality of forms and from the parti-coloured glazes. Some of the shapes have been derived from Egyptian, Moorish, Indian, Chinese, Japanese, and other examples. Considerable picturesqueness may be perceived in the form of the handles of some of the objects. Low-toned reds, mottled olives, browns, and yellows, are found in great variety. Where so much depends upon colour, it is not easy to reproduce the effect in black and white; we give a view of one of the vases exhibited by Mr. Harrison.

Messrs. Maw & Co., of the Benthall Works, Broseley, Shropshire, exhibited a large collection of painted tiles and tile-panels, some of them decorated with landscapes, mosaics, and mouldings in coloured clays; also vases, jugs, and tazzas in various coloured glazes.

Messrs. Minton, of Stoke-upon-Trent, made a considerable show of a variety of different wares. There were several tea-sets, vases, plates, trays, plaques, &c. One of the porcelain tea-sets was of open work filled in with a pink glaze. Some of the vases were imitation Sèvres porcelain, and the plaques were richly ornamented with gold.

Messrs. Josiah Wedgwood & Sons, of Etruria, Stoke-upon-Trent, sent many objects representative of the historical wares of their firm, and also of those which have been introduced of late years. There were several reproductions of old vases which have made the name of Wedgwood famous. One of the works illustrated is Flaxman's vase. It represents Apollo and the Muses in black and white relief, but the vase is sometimes made in pale blue. With the pedestal, this, which stands 19¼ in., is the largest piece made by Messrs. Wedgwood. The illustration at the bottom of the page shows a vase of diced design in chocolate jasper, ornamented with small bas-reliefs. It is one of several used in the decoration of Lord Dysart's mansion at Buckminster. Some fine chimney-pieces were shown. In the decoration of Lord Dysart's mansion at Buckminster Park, Grantham, which is now being reconstructed by Mr. H. R. Ricardo, plaques and medallions are being largely used. Some of the solid jasper fronts for clocks and the medallions and plaques were exhibited.

The Worcester Royal Porcelain Company, the last we have to mention, exhibited an important collection of vases and other decorative objects, besides services, showing the various classes of decoration now in use in the works at Worcester. On the site of these works the original establishment was founded in 1751, and some of the old buildings still remain. The first important alterations were carried out in 1840, and many additions have subsequently been made. The fame of the works is originally due to Dr. Wall, who produced a beautiful artificial porcelain as the result of his scientific researches. Dr. Wall died in 1776, and the remaining partners carried on the works until 1783, when the whole establishment was sold to Mr. Flight. Many changes have been made since then, and the present Joint Stock Company commenced in 1862, with Mr. R. W. Binns, a previous partner, as managing director. The earliest designs of the original Worcester Company were nearly all painted in blue. At present the manufacture of the works embrace the following varieties:—Fine porcelain, ivory porcelain, vitreous stone-ware or semi-porcelain, crown-ware, parian majolica, terra-cotta, &c. The raw materials used consist of china clay and china stone from Cornwall, felspar from Sweden, fireclay from Stourbridge and Broseley, marl from Broseley, flint from Dieppe and Gravesend, calcined bones, both home and American. The vases, jugs, &c., were mostly of ivory porcelain, a special body introduced by Mr. Binns twenty-six years ago, when he was in partnership with Mr. Kerr. The vase we illustrate is one of the finest works at present produced by the company. The ivory ground is covered with diaper work, and upon this the artist has made an arrangement of natural ferns, modelled and gilded with great delicacy.

Quite early in the resuscitation of the Worcester Porcelain Works it was our privilege to assist the movement very considerably, and, strange to say, this was very fully and agreeably acknowledged at the time by the persons concerned.

When the Council of the Society of Arts again organise an exhibition of Modern English Pottery, they must do it on a larger scale, and take steps to render it more widely known.

Social.—The *employés* of Messrs. Bingley, Son, & Follit, slate merchants, Millbank, Westminster, held their annual beanfeast at the King's Arms, Weybridge, on Saturday last. Mr. Follit presided, and expressed the pleasure it gave him and his partners to be present on such occasions, and trusted that they might long continue to enjoy their annual holiday.

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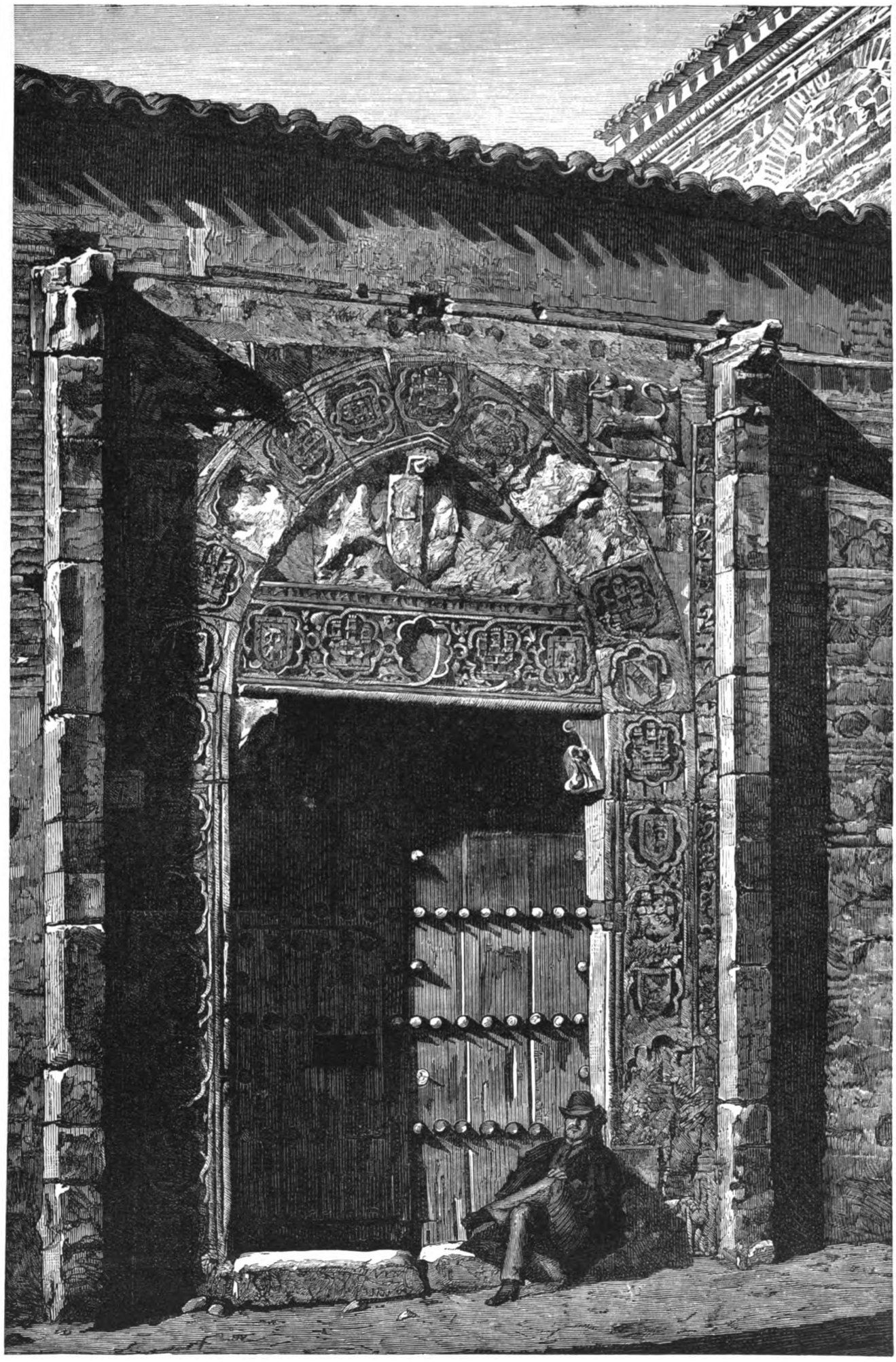

PALACE OF COUNT DON PEDRO ANSÚREZ, VALLADOLID, SPAIN.

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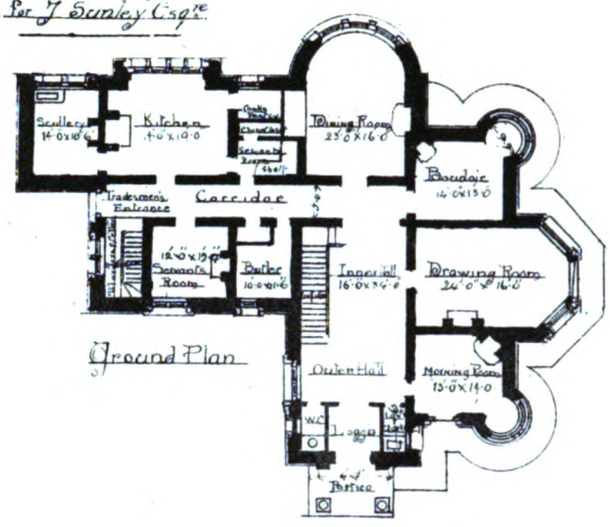
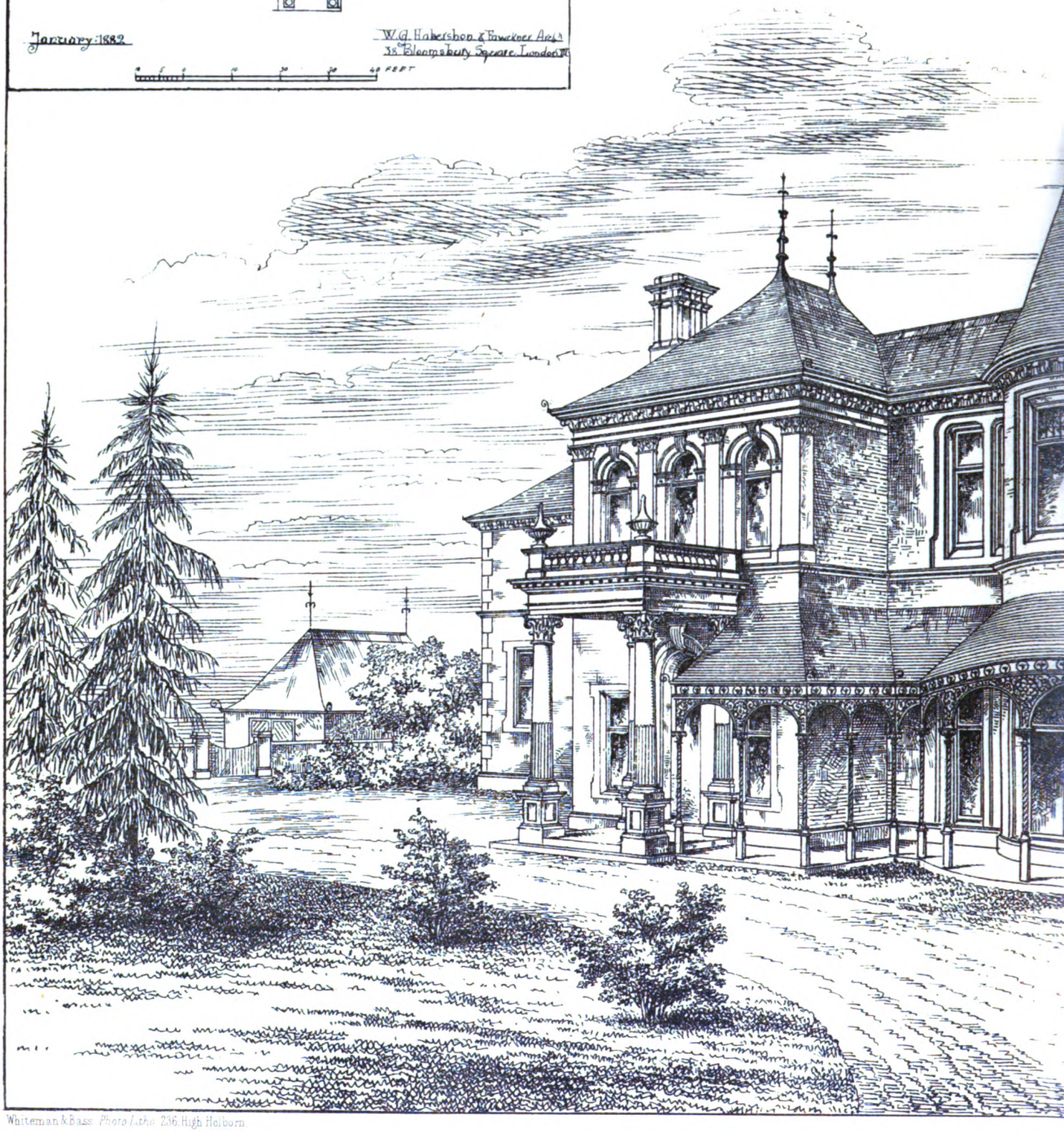
Chateau at Hyeres:
for J. Stanley Esqre





Whiteman & Bass Photo Litho 236 High Holborn

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HYÈRES.

W. G. Habershon, & Pawckner, Chrchts.,
38. Bloomsbury Square, London, W.C.

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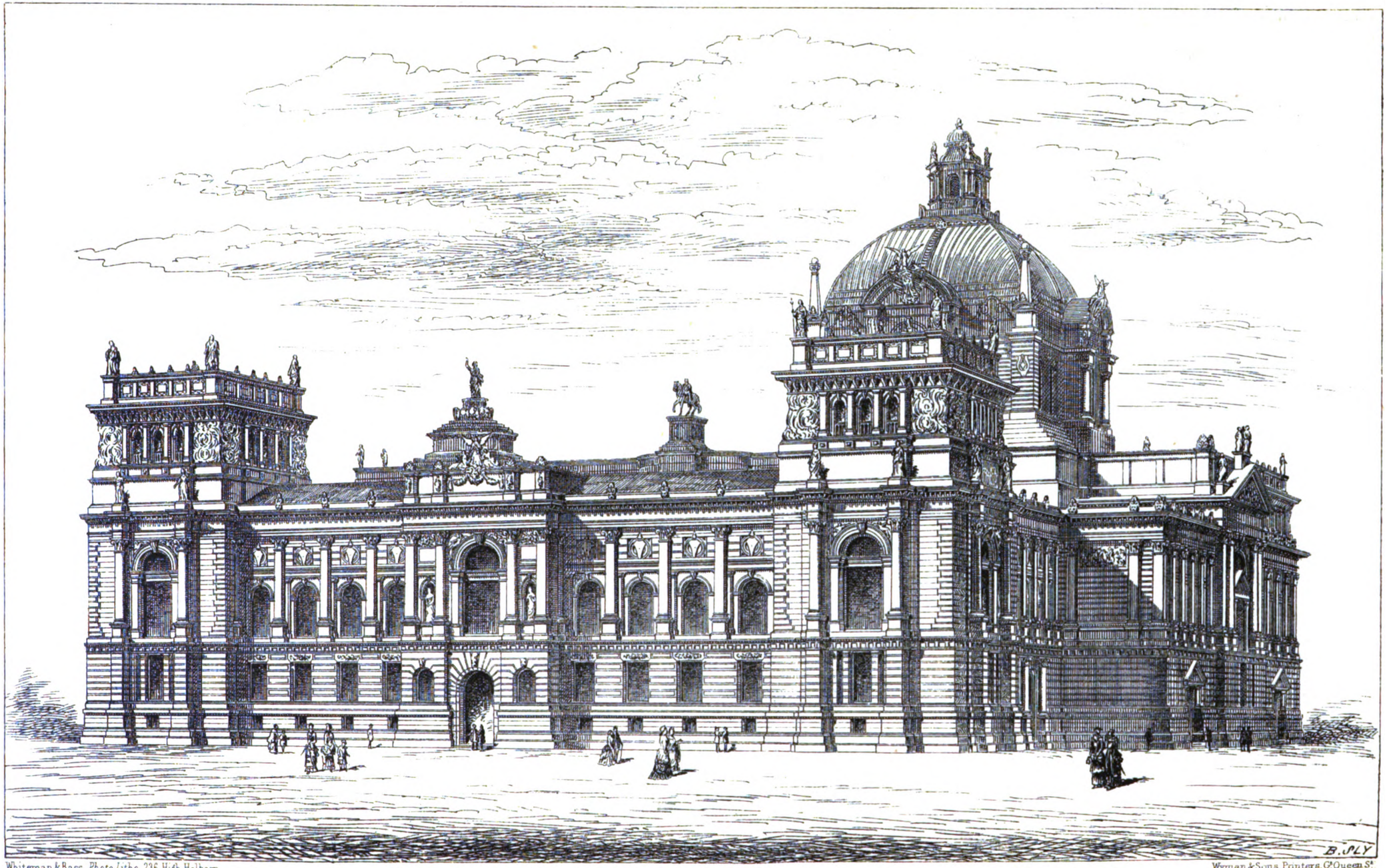

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THE GERMAN IMPERIAL PARLIAMENT HOUSE.—THE SELECTED DESIGN, BY HERR PAUL WALLOT.

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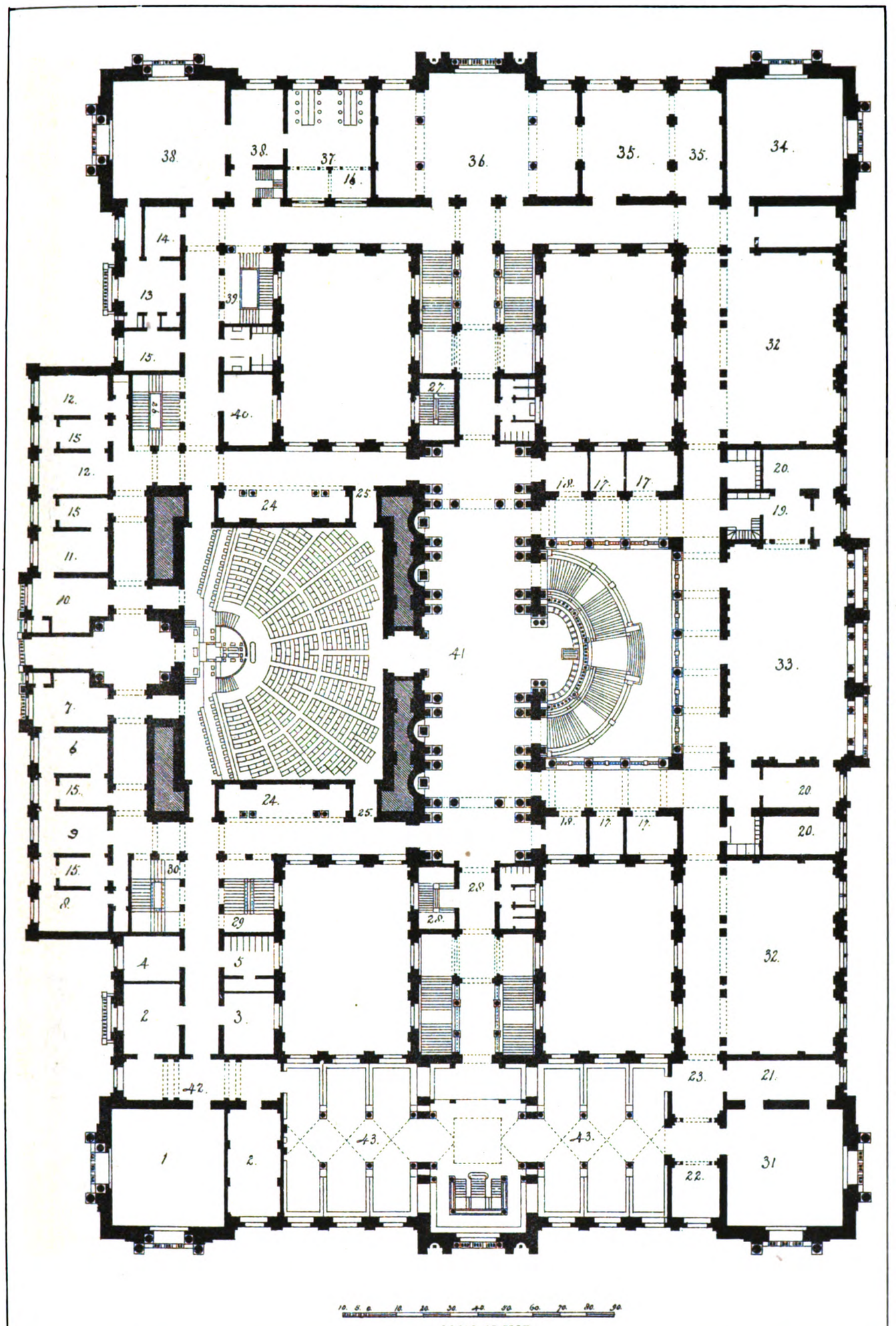

Whiteman & Bass, *Photo-Litho* 236, High Holborn. Wyman & Sons, Printers, Gt Queen St.

THE GERMAN IMPERIAL PARLIAMENT HOUSE.—PLAN OF THE PRINCIPAL FLOOR: HERR WALLOT'S DESIGN.

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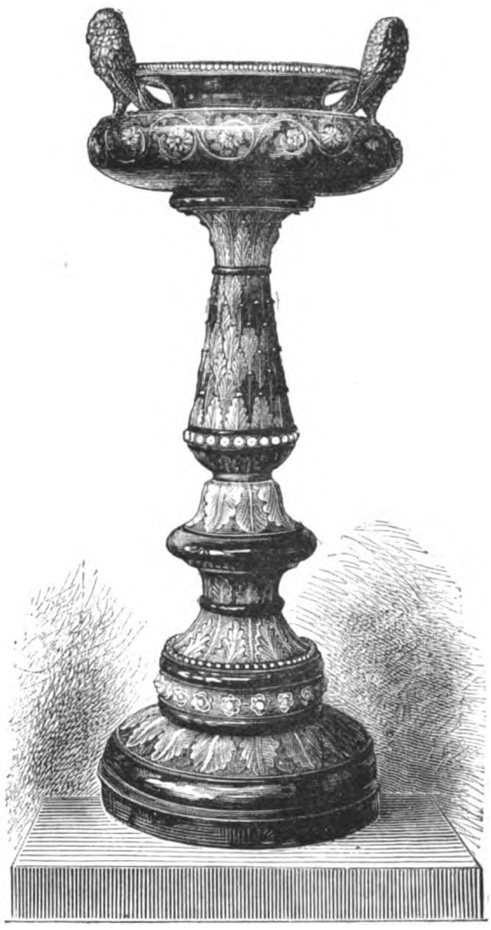
DOULTON WARE.

DOULTON'S SILICON WARE.

LINTHORPE WARE.

WEDGWOOD VASE.
Pale Blue and White Jasper.

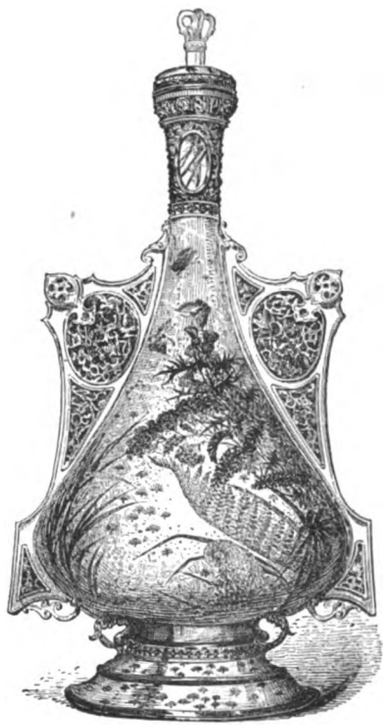


DOULTON WARE.

WEDGWOOD VASE.

WEDGWOOD VASE.

BROWN-WESTHEAD, MOORE, & CO.
LARGE EARTHENWARE VASE.



WORCESTER PORCELAIN.

MODERN ENGLISH POTTERY.

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AN INQUIRY AS TO THE PRINCIPLES OF ART DECORATION.

Is the art of surface decoration referable to ascertainable laws of colour harmony, and, if so, from what source should the artist seek his inspiration? The universal agreement that certain combinations are beautiful, or the reverse, suggests the affirmative of the one part of the question, and the answer to the second part is obviously that the truth is to be found alone in the study of the book of nature.

The student, then, should first of all remark the effects of light as revealed in the rising or the setting sun, from whose glorious harmonies he will be able to derive the teachings which will guide him to the exposition of artistic truth in the practice of his work. This is to say, he will see all the force and beauty of gradation, from light to yellow, thence to orange, red, crimson, purple, violet, &c., and will be careful in avoiding every discordant note of colour in the treatment of those portions of his work which have reference to one another, as an architrave or a column to a flat surface, as a capital or base to a shaft, and as the parts of any of them to each other. Thus, green is a good colour for a wall, and blue for a ceiling. In Nature this arrangement is continually before us; and brown and green and greenish brown trunks are interspersed amidst the natural wall. So, given a green flat surface, the column or pilaster attached to, or in connexion with it, may well and harmoniously be painted another green, or a brown, not only because Nature so paints the trunks, amidst the green leaves, but because green and brown are colours in harmonious relation. Paint the pilaster in connexion with your green wall a bright vermilion, and a discordant result will be at once apparent.

This does not mean, however, that vermilion may not be employed in any case where green is the colour principally concerned, but that, if employed, it must be led up to through a series of harmonious gradations. Thus (confining ourselves to green) we will suppose for the purposes of illustration that our wall has received an agreeable tint of sage or neutral green,—a reposeful colour, and one always welcome to the jaded vision. But this is not enough; our art instincts demand that, at least, we have a band following the lines of the ceiling, and another at about the level of the eye, when sitting down. Now, what is the first colour to be superimposed on our neutral green ground? Clearly, another green a few shades darker as the groundwork of the bands. The bands, however, being drawn, we find that the wall surface below that, at the level of the eye, now bears a different relation to the whole; we, therefore, demand another tint; let it be painted a brownish green. This, in its turn, developes the necessity of another band of a deeper tone or colour following the line of the floor, which we will paint a dark bronze-green. Thus, in architectonic order, we have base, dado, surbase, surface, and cornice.

From plain surface to straight defined line, the instinct leads us thence to curves, and we essay what is termed ornament in our treatment of the bands and surfaces. First, where shall we begin? The artist intuitively selects the main surface of the wall between the surface and the ceiling, which he will decorate with a leaf and flower design *lighter* than the ground, and reaching in gradation almost to white in the corollæ of the flowers. He will paint the shadows of the leaves and flowers a *darker* green than the body of the wall, and the corolla he might even sparingly pick out in gold. For this treatment a natural wall of leaves and blossoms played on by the sunlight may be supposed to have furnished the hint. This surface decoration being accomplished, we have, so to speak, killed the plain green of the band below, which may be brought to life by first striking an almost white-green narrow line, followed by others in three or four gradations of tint, until a darker green than the band is reached. These will form the upper border. The lower border should begin with a line of darker green than the surface of the band, followed by others, until a dark bronze-green is reached. The surface of the band within the borders now demands decorative treatment, in which brown, purple, and blue may be so harmonised in leaf and flower, interspersed, as to suggest Nature's horizontal tints. The dado, on its brownish-green ground, may be diapered in brown, green, and gold, and the dark bronze-green base relieved by lines of gold. All this lower portion leading up to the horizontal band above the dado may not inaptly typify the ground or natural floor studded with varied vegetation. There remain but the upper band at the ceiling, which should be done in alternate lines of gold and grey; and the ceiling, which may be painted a light blue, to complete the typical picture of a landscape on the walls of our apartment.

This, however, assumes nothing beyond the embodiment of the principle which is at the root of true decoration. There is no reason why, instead of a prevailing green colour, one of an opposite nature,—red, for instance,—should not be adopted so long as the same principles are observed in its treatment. To paint green leaves on a red ground, or to have painted red leaves on our green ground, would be a clear departure from them, and the result repulsive to the least cultivated observer, ignorant of any reason wherefore. A highly-cultivated taste is necessarily conversant with the principles of beauty which minister to it.

Although, admittedly, the adoption of any one prevailing colour is not absolutely wrong, provided it be subjected to harmonious treatment, it may be observed that some colours are not only repellant and unwelcome at first sight, but become positively harmful to the vision by their continuous presence. No quality or arrangement of colour can be truly beautiful on which the eye does not delight to feast or dreamily repose. That which hurts the eye cannot be admitted largely into the domain of art. Thus, as we cannot look at the mid-day sun, or even on a field of poppies, without pain, or on mounds of scoriæ and plains of upturned peat without weariness; and, on the other hand, as the eye revels or reposes amidst the greens, and browns, and violets, and purples, which Nature lavishly sets forth to our view, so should we select those colours as key-tones in art, which her exemplar teaches us are beautiful.

This does not, of course, preclude the use of any one or another colour, except in the sense of degree as to depth. Thus, following the principles observed in the treatment of our typified landscape, we will now suppose red to be the prevailing tint or key colour to be worked upon. Our main surface would be scarcely deeper than salmon, from which would spring crimson reds, dark browns and chocolates for the bands, dados, and bases, and vermilion and black and gold ornamentation in the bands, and so on, following the method laid down for the other portions.

The objections to the use of deep or intense colours for broad surfaces, unless they are destined as backgrounds for sculpture or paintings, are,—firstly, their tiring or painful effect upon the eye; and, secondly, their great absorbent power as regards light. To mitigate the first, designs in lighter colours might be painted upon them, with the result, however, of practically destroying their effect as dark surfaces; or, secondly, designs in dark colours might be employed, but these alone would only intensify their light-absorbing power. We will then suppose that a dark red be given as the key-stone for decorative treatment in accordance with the principles already laid down. For the bands a still darker red, or a chocolate, would be used; for the dado, a rich brown, and bistre for the plinth. Next, what is to be done with the main surface between the dado and the ceiling, so as to qualify the light-absorbing power, without painting upon it a design which would practically bring it to a much lighter surface? Inferentially, it has been suggested that this would be effected by placing sculpture or hanging paintings; but as we are not concerned with a picture or sculpture gallery, we must look to our art to supply the need in question.

In conformity with the principle that the eye of taste demands the effect of lines to break up or relieve surface monotony, we are irresistibly driven to adopt them in the present case; the true artistic impulse being to suggest the semblance of windows or mirrors, which it will seek to do by symmetrically-arranged relieving lines of gold; these, by their strong reflecting power, compensating for the undue absorption of light by the dark surface. Gold would necessarily be used here considerably in the entire treatment of the work, not in masses, but in narrow lines, straight or curved, relieved by deep browns, chocolates, or blacks. The colour for our ceiling in this case would be a red tempered grey, the true tint being obtained by a graduated treatment of the upper band, which represents the cornice.

It goes without saying that these principles apply to the decoration of walls and ceilings under the most elaborate architectural forms and breakings-up of surfaces. Where plane surfaces of any great extent do not exist, the necessity for qualifying their absorbent tints is less exigent. As a rule, when broken-up surfaces are treated in polychrome, the salient ones should have more reflective tints than the receding, not necessarily lighter, but warmer. This is strictly in accordance with Nature's teaching, and must be followed in decorative art if it is to be worthy of the name.

All colour culminates in gold or its analogue, which is to say in the most highly reflecting expression of tint. The glittering whiteness which it displays when under a strong light is due to its power of giving back with interest the chromatic quality of every sort of light which is thrown upon it; or of the colour of whatever surface it is laid upon. Thus its employment in decorative art is of the highest importance, and its right or wrong use will go far to make or mar a work well considered in other respects.

The effect of gold lines upon a broad ground of chocolate, green, purple, blue, or maroon is as forcible and telling as upon one of dark red. The non-reflecting qualities of all these colours demands the juxtaposition of gold,—the cumulative colour *par excellence*,—to strike out, or develope, sympathetically, their latent power, enhancing the while its own inherent beauty. The effect of gold lines upon a broad surface of orange or vermilion, however, would not be such as to commend itself to the eye of taste.

That gold, the culmination of colour, centre of light, or source of colour, may be used with artistic effect upon surfaces whose tints are so far removed as almost to touch the borders of negation, may appear inimical to the doctrine that bright colours must be led up to by gradation, and that the juxtaposition of colours is only permissible when they are related by strain. But this is not so. It is in conformity with the principles laid down and so far illustrated that gold, or even silver, may, in the circle of colour harmony, unite with the nearest or remotest blue, as the stars reveal the beauty of night, and the sunlight that of the midday sky; but a golden sun set in a blood-red sky would be contrary to the conditions of subjective existence.

Nature, then, whether revealed in the sublime glory of the rainbow, or the painting of a flower, is the only true source from which the decorative artist can draw instruction and inspiration. But how little she has been studied hitherto is made abundantly evident by the many examples of what may be termed polychrome mistakes that have been perpetrated. Assuming it to be true that decorative art in colour may legitimately be applied to moulded architectural or sculptural forms, it is clearly the business of the artist to develope, not hide, their qualities; yet how frequently are vaulted roofs disfigured by meaningless reds and blues picked out in moulding and dog-tooth in the ribs of the groined arches? This is hideous and untrue, and as destructive of the architectural beauty which these features would derive from their own native colour and chiaroscuro as the war-paint upon the body of a Red Indian is to the natural beauty of his skin.

It follows, where form rules, colour must obey. We paint our canvas or our wall, but our sculptural or architectural feature is its own subject, and the material in which it is wrought or expressed can embody all its beauty and meaning. The vandalism that would paint sculptured leaves of any colour, most of all green, is at one with that which would paint white marble mouldings red. The house-painter is here the superior of both sculptor and architect.

Perhaps, with the exception of the purest white, and rarest and most costly variegated marbles, there is no building stone that is not susceptible to enhanced beauty by the help of external colour applied to its plain surface. But where the material is not ugly,—as is a dead brick wall, which we plaster, or colourless and bare, as is the plaster surface which we decorate,—but has positive chromatic beauties, as nearly all building stones have, these should be accepted as the key-tones to the harmony of all superimposed decoration.

True knowledge is indispensable to the artist who would essay to emphasise the sombre grandeur of the red sandstone, or the aërial majesty of the oolites and white limestones of which our cathedrals are severally the structural expressions. At the outset several questions came up for consideration. To what extent the

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builders of the cathedrals employed colours? We have it in the evidence of the works themselves that it was but sparingly, and mainly confined to wall diaperings and spandrels. That this was often but experimental is sufficiently proved by the remains of its partial or sectional application, and that it was in any sense general is negatived by the absence of any trace of colour in many fine examples. It is clear the Gothic builders were not indifferent to what may be termed structural polychromy, as is shown by the intermixing of coloured marble and other column shafts with the piers, and the banding of vaulting in parti-coloured stones; and that they had the keenest appreciation of colour is shown by their windows, whose glazing tints have down to the present time remained unrivalled in quality and richness. Not to mention the painting of the wooden roofs, which belongs to a period at which the sun of Gothic art was, perhaps, about to set for ever, we may fairly conclude that colour decoration, as applied to the main structural features of Mediæval work, was not of the importance that would justify us in ranking it as a distinct branch of Gothic art. What reasons, then, withheld the Gothic builders from pursuing to its end an art which they essayed only to abandon? The long period comprising the entire era of Gothic art, from its rise to its decline, within which most cathedrals and many churches grew slowly to their final completion, may supply an answer. On the other hand, there are many cathedrals which were begun and finished as to their internal completeness, in one period of style which are conspicuous by the absence of any colour decoration whatever on their walls and mouldings. It would appear that though it was believed colour would add to the beauty of their work, they failed in its practical application, and renounced their faith in its possibilities. Were they wrong in their method and wrong also in their conclusion? An affirmative answer may safely be given to both. They erred, not in superimposing colour on surfaces whose tints were elaborated by the chemistry of Nature ages before the first stone received the mark of a chisel, but by their having failed to enlist and apply colour in its true and subservient relation to architecture and sculpture.

Paint or colour may legitimately be applied to wood as a preservative, or for art purposes where Nature has not given the wood a beauty of its own; also to imitations of stone on walls, and to moulded plaster work, and to modelled sculpturesque designs cast in a common mould, because these are not art, neither do they reach the dignity of handicraft, being imitations merely, the outcome of gradual casting. These things possess no inherent beauty, having no inherent truth, but so far as they exist they open fields of labour to the decorative artist. But the case is otherwise where the hand and eye of man have deftly wrought the moulded forms among which, with varied humour, the sun's rays delight to play, or where Nature's teachings and man's experiences and aspirations are recorded in sculptured capital and frieze. Here, colour externally applied can have no home. The sculptor's work is his own, and no part of it can belong to the painter.

If not, then, on the deftly-cut moulding, or sculptured capital and frieze, where is the artist to seek the field for his labour? Clearly in the surfaces which art has not already enriched; on the simple squared stones of the plain wall surfaces, between jamb, arch, rib, and column. Arcades, spandrels, and vaultings present a hundred canvasses already framed for the artist's work. Does the cold stone yield but a surface all too crude and harsh? Cover it with plaster hard and smooth as marble, worthy to receive the highest effort, or lay upon it the choicest mosaic that genius and material can command. What glorious opportunities are here offered by one art for the exercise of another. Unconfined to square, or circle, or any set geometrical form, the artist can hold revel within spaces, whose outlines are prodigal in stimulatives to invention.

We have spoken of key-tones: the term may be amplified into key-tone note, as supplied by the prevailing colour of the fabric, to which the artist must, so to speak, attune his work. The importance of this justifies the insistency of its observance at the risk of appearing to go over the same ground. To paint up your building, not paint it down, should be the end and aim. Are you intent on a pictorial work demanding some considerable depth of colour? Let it be placed near the eye, not in the spandrels between lofty arches or on the ceiling of a dome. Broad and deep colour is fatally destructive to architectural beauty in such positions. Recent work in most instances sufficiently proves this, wherein the architect and sculptor have been practically erased or blotted out by the decorative artist, and the cardinal principles of obedience to the key-tone note of the structure practically ignored.

The sombre grandeur of the red sandstone gives forth no uncertain note to the artist who listens to its sound. It says distinctly, "Profane not the stones with mocking, gaudy hues, but lightly trace in brown and green and gold that to which thy genius urges thee, in diaper and scroll, and likeness of living thing; and make the over-arching vault to simulate the silvern grey which mantles heaven's canopy, when night approaches and draws out the stars!"

The aërial dignity of the oolites and white limestones too, in tones as clear and beautiful as the light which their surfaces reflect, speak thus to the artist's soul:—"Nor here by vulgar hues disturb the chaste and glinting light which hovers all the space around, but, on each broad interspace of arch and columned wall, let thy invention trace in lines of faintest red, rich brown and gold, each charactered device; and all the springing vault, the ribs between, clothe with a robe of blue, light as when the meridian sun tempers with gold the crown of heaven's vault!"

A. B. C.

LANERCOST PRIORY.

Lanercost Priory was visited by the members of the Royal Archæological Institute the other day, in connexion with their meeting at Carlisle. Mr. C. J. Ferguson, of Carlisle, described the building, and in the course of his remarks called attention to the two figures in the upper part of the gable, stating that it was a question whether, standing as they did, they had been properly placed. The buildings consisted of a cruciform church with conventual buildings on the south side. The plan almost sufficed to tell its history. It was a priory of Austin canons similar to that of St. Mary at Carlisle. The church must have been at first a smaller building and without any aisle. Subsequently aisles were added and extensions made, except on the south side, there being on the south side the conventual buildings. The south part of the church was the earliest, and of the Transitional period. It seemed that the intention of the builders was at first to erect extensive buildings, and that was carried out by degrees. They found the choir and eastern portion of the church and the south and west side of the cloister were built later, and the church was gradually built westwards, increasing in richness, and culminating in the beautiful front they had now. The earliest portion, the Transitional work to which he had referred, was built of different stone from that of the cathedral at Carlisle, and here the Roman stones were palpably to be seen. Mr. Ferguson then conducted the party round the buildings by the north side, passing the eastern end and coming round to the site of the cloister, traces of which were pointed out. Going through a door under what he called the guest-room, in which they had just had luncheon, he led the company into the interior of the church. Only a small portion of the party could receive any benefit from their guide's explanations, in consequence of the confined nature of the ground, the desire of a large number to see the features of interest for themselves, and Mr. Ferguson's evident wish to "get on."

Before the company had well got into the interior, Mr. Micklethwaite, at Mr. Ferguson's request, "took up the parable." He said the key to the form of a church was almost always more easily got inside than outside. When they had once mastered how a church grew they could almost at once walk to the place where the earliest work was. This was a church of regular canons, like that at Carlisle; but it differed in one respect, which was characteristic of the order. Here they had a church with only one aisle. The explanation of this was that the regular canons always founded their churches where parish churches already existed. If they had not done that, this church would not have been at present in existence as it was. When the canons built it, it was built on the parish church lines, though much larger than the parish church. The Twelfth-century parish church was built in different forms. He would only speak of one of these forms. There was a church in the form of a cross, but without aisles. The canons built on the same model, or at least began to build so. They had a church without aisles and a transept without aisles; and when they had built that much, they would build a cloister and the buildings round it to live in. The next thing they built was the nave. By the time they got to rebuilding the nave,—it was about 100 years or more after the foundation,—the ideas of aisles had grown. By the end of the twelfth century or beginning of the thirteenth, the larger parish churches began to have aisles, and the canons thought they must have aisles too, and they accordingly made such additions. The canons had certain rights here, notably the right of procession, and there were doors for the procession to go through, and they found a door from the cloister as they found it in every abbey church. A door built up opposite the present organ would bring the canons into the church; that did not serve their turn, and therefore they had another door, traces of which they would see, not far from the other not going into the church, but into the canons' part.

The party proceeded to the chancel, now without the roof, and there Mr. Micklethwaite again addressed them. He said he had not much to say, except to call their attention to the way in which, having freed themselves from the difficulty in the position of the cloister, the canons went in for double aisles and symmetrical arrangement. He could not give a reason for the pillars being longer on one side than another. As they came into the chancel they came through a doorway rather Early English than Transitional. There, he believed, was one of the doorways between the parish church and the collegiate church. On the other side they saw the door by which the canons came in. He pointed to a Transitional door, which he thought probably entered a little sacristy, and close to it there was a patch in the wall which he thought was the way up to the old dormitory.

Mr. Tucker described the heraldry of the tombs. He said that the tomb of Sir Thomas Dacre on the south was interesting, because, like poor Lord Crawford's the other day, it was violated. This was about 100 years ago, and the body, to his knowledge, was never recovered. The other tomb on the north was that of Sir Humphrey Dacre and his wife.

Before leaving the subject of Lanercost Priory it may be mentioned that some of the visitors expressed a feeling, which would occur to many, when they said it was a burning shame that the effigy cast of the chancel in the churchyard should be allowed to lie half-buried in the grass, to be kicked and disfigured by anybody. Local zeal might have done something for this.

THE HEIGHT OF HOUSES IN PARIS.

The Municipal Commission which has for some time past been occupied in examining various questions incidental to the proposed revision of the decrees of July 27, 1859, and June 18, 1872 (affecting the height of houses in Paris), has now concluded its deliberations. The following are among the principal features of the detailed scheme it has submitted to the Municipal Council of the city of Paris. These proposals, if approved, would form a basis for the new regulations.

The height of buildings should be determined with special reference to the width of the streets, according to the following scale:—

In streets less than 25 ft. 6 in. in width, the height should not exceed 39 ft. 6 in.

In streets ranging in width from 25 ft. 6 in. to 32 ft., the height should not exceed 49 ft.

In streets ranging in width from 32 ft. to 65 ft. 6 in., the height should not exceed 69 ft.

In public places, squares, boulevards, &c., from 65 ft. 6 in. upwards in width, the height of 65 ft. 6 in. is allowable only on condition that there should not be more than five stories (including the *entresol*) above the ground-floor, no part of the 65 ft. 6 in. being used for a sixth story.

Buildings, the entire façade of which lies back from the street, might be allowed a height respectively of 49 ft. or 59 ft., provided that the distance back from the line of houses added to the width of the street gives a width in the one case of not less than 25 ft. 6 in., and in the other of 35 ft. Buildings lying back from the line of houses in streets of 65 ft. 6 in. in width, might be allowed a height of 65 ft. 6 in.

The maximum height of buildings in courtyards and gardens would be 59 ft.

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INSTITUTION OF MECHANICAL ENGINEERS.

On Tuesday last the twenty-seventh summer meeting of this body was opened in the civil court at the town-hall, Leeds, by the mayor of the borough, Alderman Tatham. There was a large attendance of the members, and the mayor welcomed them in an address, in which he showed how indispensable skill, industry, and activity were to secure that superiority in quality, quantity, and price, which would insure for British workmanship a full share of the world's trade, and at the same time improve the profits of the employer and the wages of the workmen. Those being the objects of the Institution, he hoped the present meeting would be a great success, and that the present, which was the third visit of the Institution to Leeds, would surpass any of those which had preceded it in stimulating mechanical ingenuity.

The President, Mr. Percy G. B. Westmacott, of the firm of Sir William Armstrong & Co., of Elswick, Northumberland, acknowledged the hearty welcome given to the institution by the chief magistrate. Having mentioned that there they met the descendants and survivors of those who had been among the most eminent in the engineering profession, he paid a tribute of respect to the memory of the late Mr. W. Menelaus and Mr. C. P. Stewart, after which he went on to speak of the importance of a nation or a community applying its inventive faculties to the moving of materials for useful purposes with the least amount of manual labour and waste. To extend and cheapen transport by land and by water was, in fact, to be in the van of all real work, of substantial progress, wealth, and civilisation. In the marvellous and gigantic structures of the East there was an enormous waste of manual power. They served no good or useful purpose for mankind, and stood only as monuments of man's pride and self-glorification. We might pride and plume ourselves upon the vast strides which science, art, and engineering had made in our own time, but posterity would assuredly lay its finger upon the great blot of waste, and stigmatise our age as the Black Age, which had spoiled by careless, unnecessary, and selfish emissions of smoke and noxious gases many a noble town and many a lovely spot on earth. The smoke nuisance was altogether inexcusable, and could not be too severely dealt with. The president went on to show that no really good invention was ever completely thrown aside, even though it might be superseded by some other invention. For instance, candles had not interfered with the use and progress of the oil lamp; gas had not snuffed out candles; and he did not agree with those who believed that electricity would totally supersede gas. As to the means of transport across land, it might, at first sight, seem singular that railways, lessening, as they had done, to an enormous extent the cost of land carriage in comparison with other traffic, had neither done away with horses and carts nor drained canals of their freights. The president's address went on to narrate how, on the Aire and Calder Navigation, which terminates at Goole, a boat containing thirty tons of coal is by a hydraulic hoist lifted bodily out of the water, and its contents are directly upset into the larger river craft; and, as this system is being further developed for boats of 150 tons, the president proceeded to ask, might there not be in this the precursor of the time when ocean-going steamers would without loss of time, on arriving in port, be lifted bodily out of the water and then scuttled of their contents right and left into warehouses, at a rate and with a saving of labour which would far exceed anything hitherto attempted? The extraordinary results from a concentration of work to the fullest extent upon a limited area had not always been properly recognised by dock companies. It had frequently happened, but more so abroad than on our own coast, that where a pressure due to an increase of trade had come upon a dock, it had been met by enlarging the dock area, and lengthening the quay space, at a great cost, instead of first making the best use of mechanical arrangements for quickening the discharge of vessels, and for the movement of goods to and from the quay.

Interesting papers by Mr. A. H. Meysey Thompson, on the History of Engineering in Leeds; and by Mr. Cochrane, of Stourbridge, on Blast Furnace Workings, were read, the latter evoking discussion. In the afternoon some of the works in the town were visited.

THE IRISH NATIONAL EXHIBITION, DUBLIN.

This exhibition, which has been promoted by the Irish Nationalist party, with the commendable view of furthering native industries and manufactures, was opened on Tuesday last, in a building erected for the purpose in the Rotunda gardens.

The exhibition building has been specially erected from the designs of Mr. Ashlin. The exhibition itself, however, is, we are sorry to hear, but a miniature of the exhibition held in Dublin in 1853. This is due, it is alleged, to political differences between those who were the first promoters of the scheme, which was put forward about a year ago. A guarantee fund of 20,000*l.* was at that time speedily promised, and all would have gone well but for the differences to which we have alluded,—differences which led to the withdrawal of a large number of the guarantors, and to the refusal, on the part of a large number of manufacturers, to take any part in the show. Ultimately, those of the original promoters who remained resolved to abandon the guarantee fund, and to raise the necessary funds required for the exhibition by forming a limited liability company. Notwithstanding these unhappy differences, the exhibition is spoken of as containing some admirable examples of Irish manufacturing enterprise and skilful handicraft.

The opening ceremony was performed by the Lord Mayor of Dublin, one of the directors of the Irish Exhibition Company, and to whom an address was presented by his co-directors. The address contained the following passages:—"We have not sought to exclude any interest. The work of all willing or likely honestly to labour for Ireland has been accepted. As Irishmen are received abroad, so we desire that those not Irish born, and who have cast in their lot with us, should here be received. In striving and working for our own country we are not actuated by narrow feelings towards others, especially towards neighbouring nations. We have striven to feel that a generous rivalry elevates, whilst narrow jealousies debase nations as they debase men. Much more depends upon ourselves than upon others in the elevation of this our own dear country. We trust that through Divine favour this effort of our shareholders, through your and our instrumentality, will forward the interest we all have at heart,—the interest of the true peace, enlightenment, and prosperity of Ireland."

The Lord Mayor of Dublin, in the course of his reply, said:—"I cannot forget nor forbear to mention the hopefulness and spirit that animated the trades and working-classes of Dublin and of all Ireland in supporting you and me in the task we had undertaken. The success is a tribute to their energy and self-reliance; and this fairy building is a lasting memorial to the genius and steady perseverance of Irish workmen. Give them fair play, and I will guarantee their fidelity and exertions. They have left behind them here a lasting proof of their power to carry out a work without a moment's interruption. I may only wish all the new-born industries of Ireland a like support. This Exhibition blends, as you say, all creeds and classes in the great work of national progress. May it be an omen of the extension of that union so indispensable to our success. We do not desire to exclude the productions or manufactures of other lands, but rather to encourage and develope our own. No one can blame us for this. . . . . The employers and workmen of Ireland have the future prosperity of the country in their hands. Here these two interests, well balanced and just towards each other, have achieved a triumph which, I hope, may be only the first of a long series for our country. I cannot reciprocate your concluding prayer for my own happiness, to which this day so largely contributes, without conveying in an especial manner my thanks to our excellent staff. The tribute to our architect, Mr. Ashlin, is all around us; Mr. Dudgeon's work is everywhere to be seen; Mr. Rooney and his colleagues deserve immense praise for their untiring exertions, promoted by an interest higher than any reward could create."

Sanitary Institute.—The fifth Autumnal Congress and Sanitary Exhibition of this Institute will be held at Newcastle-upon-Tyne, on September 26th to 30th, under the presidentship of Captain Douglas Galton, F.R.S.

THE O'CONNELL MONUMENT, DUBLIN.

On Tuesday last Dublin was *en fête*, for not only was the Irish National Exhibition of Industry opened, but the monument of "the Liberator," Daniel O'Connell, was unveiled. The monument stands at the head of Sackville-street, within view of the old Irish Parliament House. Its execution has extended over several years, partly owing to the magnitude of the work, and partly in consequence of the delay caused by the death of Mr. Foley, the sculptor who was commissioned to carry it out. On Mr. Foley's death, the completion of the work was entrusted to Mr. Brock, who has faithfully carried out the work in accordance with Foley's intentions. According to the Dublin *Freeman's Journal*, "the structure stands 40 ft. high, and consists of three distinct parts. Surmounting all is the figure of the Liberator, 12 ft. in height, representing him enveloped in his historic cloak. Next comes the cylindical drum, bearing fifty allegorical figures in high relief. Of these the principal is Erin, 8 ft. high, trampling her cast-off fetters under foot, while with one she grasps the Act of Emancipation, and with the other points up to her Emancipator. The other figures are symbolic of the Church, the Professions, the Fine Arts, the Trades, and the Peasantry. Then the third part is the base itself, formed of two gradients." The four winged Victories which are to project from the corners are unfortunately absent, owing to the incompletion of the casting of one. They will form a most prominent feature of the completed monument. The Victory of Patriotism has seized a sword in her right hand and bears a shield in her left; the Victory of Fidelity holds a mariner's compass and caresses a dog,—both types of constancy; the Victory of Eloquence, with a look all fire and life, clasps a roll of documents; and the Victory of Courage is in the act of strangling a serpent as she grasps a bundle of reeds, typical of the doctrine,—union makes strength. The monument has cost 10,000*l.*

WATERPROOF CEMENT.

From the account published by Herr C. Puscher, in *Kunst und Gewerbe*, of the many experiments which he has made to render cement manufactures, cement and lime plaster proof against the effects of the weather, it appears that a cold solution of one part of green copperas in three parts of water is extremely effective. Cement manufactures are put into the solution for twenty-four hours, and then, coloured greenish black by the oxidulated iron hydrate which has been formed, dried in the air. The absorbed solution of copperas has been decomposed in the cement, and the combination of hydrated peroxide of iron formed is stated not only to render the cement denser and harder, but also, as it is not affected by the weather, to impart to it greater resistance. The weight of the cement is increased by ten per cent., without any change in form. It would be interesting to learn whether the favourable opinion of Herr Puscher is confirmed by other experimenters. Cement plaster is protected against the effects of the weather by repeated applications of the copperas solution. If, after the fourth application, the cement does not turn a dark greenish-black, it is a sign that the surface has become saturated with the iron combination. After drying, a coating is formed on the cement of an ochre-like colour, which cannot be washed off with water, and which will take water-colours. If cement plaster thus prepared is to be permanently painted with oil colours,—which, as is well known, peel off ordinary cement,—two applications of 5 per cent. soap water are sufficient to render it waterproof, and, after drying and rubbing with a cloth, as shiny as oil colour, so that one coating of the latter may be saved. In order to protect cement manufactures prepared with copperas against acids, alkalis, and the influence of the weather, a layer, penetrating a few centimètres, of a heated mixture of equal parts of ordinary paraffin and paraffin oil, or petroleum, is sufficient, which is obtained by immersing the heated cement articles in it for a few minutes. This cheap copperas solution may also be used for old or new lime plaster; old lime plaster must, however, first be freed from loose particles of colour by washing off. It is not advisable to mix the cement and sand at once with the copperas solution, as cement thus prepared cracks after drying.

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"TO BE OR NOT TO BE."

PADDINGTON PARK.

At a moment when, though somewhat tardily (and if the effort is not made very vigorously the opportunity will be lost for ever), the question of creating Paddington Park is being again energetically mooted by some of the leading men and leading journals of the day, it more especially behoves this paper to advocate this important scheme. The *Builder*, as the late Mr. Street, R.A., remarked on the occasion of the presentation to its editor of the royal gold medal, has ever been one of the chief organs in advocating not merely art, pure and simple, as embellishing this vast city and charming the eye, but in striking deeper still, and exposing the crying evils of bad drainage, bad ventilation, bad buildings, especially as they affect the condition and happiness of the lower classes (and without these remedies mere beauty is but as a "whited sepulchre"), and should feel bound now to continue its efforts.

There will always be, alas! in a vast and ever-increasing city like this, overcrowded neighbourhoods, hotbeds of disease, where, if people keep alive, they still do so with a diminished vitality; and the only remedy possible,—the only possible antidote to the poison,—is pulling down the houses here and there, and forming open spaces, playgrounds, if I may call them so, in which adults and children can for the nonce get their lungs inflated with a purer air. From amongst the numerous letters on the subject which have appeared, I should like to quote one from the *Daily Telegraph*, bearing on the subject, and signed "Fieldfare":—

"As it seems to me impossible that a word can be said in favour of building upon the pleasant patch of isolated verdure on the northern hem of Paddington, I will leave the question you have so opportunely brought before the public to be solved, as I cannot but hope it will be, by wise counsellors. My purpose now is to edge in a plea for open spaces in general. Will you permit me, in a very few words, to submit a practical proposition? It is, that in all future extensions of the town a compulsory law shall provide for the inviolate reservation of a tithe of open ground for every hundred acres built upon. We have reached a certain danger, which can only be averted by some such plan as I suggest. Richmond, Twickenham, and other towns outside London, though threatened by its advancing strides, now begin to estimate the value of the old rustic green, happily preserved in their midst. So should it be, I contend, with every new suburb. Let the rapacity of builders be held in check by the Legislature. Compel every 'improving neighbourhood' to retain a village green proportioned to the acreage of streets and houses. There is no way but this out of the perils now besetting Londoners and their children."

But if such a harsh word as "rapacity" can be applied to builders, even their rapacity would in this case be short-sighted policy. The nearer to fresh air the more easily lettable, the more likely they are to secure lucrative tenants. The architect, the builder, in these modern days, plays an ever-increasingly important rôle in the onward progress of civilisation and humanity. If a sound mind in a sound body be the highest earthly desideratum, so a foul tenement lowers and debases a man's moral nature, whereas a clean and sweet abode has indubitably an influence in tending to make a man "live up to it." Overcrowding must always militate against a happy state of things; and that our forefathers were of this opinion is evident from the edicts issued in those cheery days of pretty rural England (1580), when one "payde 5s. for a lambe, 3d. for a pint of claret wine, and 4d. for a pecke of oysters," those days of May-scented turfy lanes, of quaint old rustic inns, when Bond-street and Conduit-street were so much country that my Lord Mayor Harper and aldermen hunted the hare, killed him, then to dinner at my Lord Mayor's banqueting-house (Stratford-place), then after dinner to hunt the fox, which, after much hallooing, they killed in St. Giles." Well, in those days the great queen, and her successor, James I. (1602), issued restrictive edicts for restraining the increase of buildings, and in 1657, during the Commonwealth, so necessary were open spaces thought to be that an Act was passed inflicting a penalty of 100*l.* upon every person who should erect any dwelling-house, out-house, or cottage without assigning four acres of ground to each respectively. Shade of Elizabeth! what would she say now?

In Paddington, there is crowded together a population (according to the census of 1881) of 107,000, and according to a later computation, of 130,000 souls,—more than the whole population of Brighton,—and of the 244 municipal cities of the boroughs of England and Wales, there are only sixteen having a larger population than Paddington. If their park be taken from them they have no open space nearer than a mile and a quarter or mile and a half. The well-known sanitary reformer, Dr. Hardwicke, pointed out the *absolute necessity* of securing the 80 acres that yet remain from the encroachment of bricks and mortar. At one time they could have been secured for less money than is now demanded by the Ecclesiastical Commissioners, into whose hands the Paddington Park estate, once belonging to the see of London, has now passed, and is administered by them under two trustees, who have it on a ninety-nine years' lease, with power to let, but not to sell. To obviate this difficulty, a Bill was brought before Parliament, but not passed; a similar Bill, with certain clauses eradicated, is to be again brought before Parliament. Towards the 200,000*l.* necessary for the purchase of the park, the Metropolitan Board will give 80,000*l.*; 30,000*l.* is already raised in subscriptions (and this, it is calculated, will soon reach the sum of 50,000*l.*). But if the deficit of 70,000*l.* be not made up, the scheme must fall to the ground. More shame to London if it do; for it is not Paddington alone this question concerns, but London at large, — the wealthy even, whose lot has been cast in pleasant places, who have the large areas of Hyde Park, St. James's Park, and squares innumerable. Little by little their palatial residences have swallowed up the few spots left to the moderate incomes of the poorer gentry. But they would do well not to stand by and see the poorer still deprived of even that he hath. They little dream how neglect of the considerations urged may forge an arm that will strike with unerring aim through the triple panoply of indifference, of luxury, and wealth. For the pestilence that flies by night, that stalks abroad in the noonday, is held in such slight check on the borderlands of poverty, and in these days of rapid communication it can penetrate by such undreamt-of and indefeasible channels into the very strongholds of the high and mighty of the land, that if self-preservation be really held by some to be the first law of nature, that very consideration alone should bring moneyed and energetic recruits to that band of excellent gentlemen who act on the higher and diviner law, and who, like Abou Ben Adhem, in Leigh Hunt's beautiful poem, "Love their fellow men."

CARLEON.

THE CRYSTAL PALACE ENGINEERING SCHOOL.

The certificates gained by the students at this school during the summer term were distributed on Saturday by Sir James N. Douglass, Engineer-in-Chief to the Trinity House. In opening his address, Sir James expressed his satisfaction at finding the practical nature of the training at this school, for he held that real hard work was the foundation of success in the profession. He believed it to be the backbone of his own career. As an illustration of what he meant as real work, he alluded to a practice of this school which he thought admirable, viz., the making of a fictitious order for some part of an engine or other work, the design and construction of which were carried out from beginning to end by the students. The Civil Engineering students were engaged in such works as the preparation of plans for Parliament, the making of plans, calculations, and estimates for an imaginary railway and dock, and the actual survey of existing engineering works. He was particularly interested in the thorough nature of this training, and congratulated the principal of the school upon it. In the colonial section, where young men are prepared for life abroad, he was glad to find upon inquiry that the students were taught the use of the soldering-iron, for such tools must always be ready to the hand of the colonist. He had often been struck at the facile way in which the gipsies, with no tools other than a pair of pliers and a soldering-iron, made works both of use and beauty, and he failed to see why other people should not acquire the ability to do the same. At any rate, he would be well assured that this should be the case with his own sons.

The report, which was read by Mr. F. K. J. Shenton, showed very satisfactory work. The Lecture examination of the term has been on "Railway and Dock Work," and of twenty-one students eligible, sixteen have passed with success. The first places were obtained by A. J. Allen, G. C. Borton, and D. Allport, with 212, 196, and 184 marks respectively out of 277. The first places in the drawing-office were gained by F. E. Ross, D. Allport, and A. J. Allen; in the pattern-shop, by G. C. Borton, F. J. Piggott, and C. T. Spencer; and in the fitting-shop, by J. R. Pratt, J. A. W. Brunton, and F. N. Dymond. In the second year's course, the civil engineering section, the chief honours were taken by R. P. Barnes, J. R. Crook, H. Skinner, E. S. Tiddeman, and A. H. Winfield. The good positions attained by the school was indicated by Mr. J. W. Wilson, the principal, who gave a recent case that had come under his notice.

In proposing a vote of thanks to the examiners of the term, Mr. James Cleminson, M.I.C.E., and Mr. W. Lawford, M.I.C.E., Mr. Shenton said that he attributed much of the success of the school to the great aid that had been given by eminent men in the profession.

The proceedings terminated with a vote of thanks to Sir J. N. Douglass, who said in reply that he could, on behalf of the council of the Institution of Civil Engineers, assure the directorate of the school and its pupils of the good feeling of that body to them, and of the readiness to aid they would always find in its members.

COST OF ROAD WATERING IN SOUTH LONDON.

At a meeting of the Lambeth Vestry, held on the 10th inst., Mr. Dunkin, chairman of the special committee appointed on the question of road-watering, reported that they had fully considered the question which was referred to them by the vestry, as to the expediency of having the water for road-watering charged by meter for the future, and not by mileage, as at present. The present arrangement, the report stated, involved an annual payment of 1,550*l.*, and an additional sum of about 135*l.* for the maintenance of stand-posts, to the Lambeth Waterworks Company; and to the Southwark and Vauxhall Company a yearly sum of about 880*l.* The committee caused negotiations to be opened with both companies as to the terms and conditions on which they would supply the vestry with water by meter. Both the companies expressed a dislike to the proposed arrangement, pointing out in their replies that in their judgment it would be better that the old arrangement of mileage rates should be continued. Eventually, however, the Lambeth Company offered to supply the water by meterage, for the lower districts, at rates varying from 8d. to 1s. 3d. per thousand gallons, and for the upper districts at rates varying from 1s. to 1s. 6d. In the case of each district, each stand-post was to be charged as a separate supply, 30s. each to be paid for fixing each meter. In the lower district, a minimum rate of 2*l.* 10s. per quarter, should the charge for water actually consumed not reach that sum; and in the upper district, a minimum rate of 3*l.* 15s. per quarter. As the vestry have in the lower district forty-eight stand-posts, and in the upper district forty-two stand-posts, this minimum rate alone would come to 1,110*l.* per year. The committee, in their negotiations with the Lambeth Waterworks Company, tried to get the company to treat the entire water consumed by the vestry as one supply, but this the company refused to do, and insisted upon the quarterly minimum for each stand-post. The negotiations with the Southwark and Vauxhall Waterworks Company resulted in their offering the vestry an arrangement precisely similar to the arrangement offered by the Lambeth Waterworks Company for the lower district; that was, at rates varying from 1s. 3d. to 8d. per thousand gallons, according to supply taken, each stand-post being treated as a separate supply, with a minimum of 2*l.* 10s. per quarter, which would give a minimum of 430*l.* per year for the Southwark and Vauxhall Waterworks Company, as there are forty-three stand-posts. The committee sought information from adjoining parishes, as to the terms on which they obtained water for road-watering. The general replies from the parishes stated that the alteration to meterage caused a saving to the parish, but it was believed

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in all cases the former rates of mileage were greater than those paid in Lambeth. On referring to the special Acts of Parliament of the Lambeth Waterworks Company, there was no scale given for supply of water by meter, section 38 of the company's Act of 1848 only providing that water for other than domestic purposes may be supplied by agreement. On referring, however, to the Southwark and Vauxhall Waterworks Company's Act of 1852, it was found that by section 57 the company are bound, at the request of any owner or occupier of any premises situate in or adjoining any street in which any main or service pipe was laid, and who required a supply of water by measure for purposes other than the purpose in respect of which rates were by the Act provided or limited, to afford a supply of water, by meter or other fit and sufficient instrument so made for measuring and ascertaining the quantity of water so supplied, and the company might charge for such supply not exceeding the following rates, viz.:—Not exceeding 50,000 gallons, 9d. per 1,000 gallons; exceeding 50,000 and not exceeding 100,000, 8d. per 1,000 gallons; exceeding 100,000 and not exceeding 200,000 gallons, 7d. per 1,000 gallons; exceeding 200,000, 6d. per 1,000 gallons, with a minimum of 25,000 gallons per quarter, which would give a minimum of 18s. 9d. per quarter. The scale given by this section was much more favourable to the consumer than the scale offered by the Southwark and Vauxhall Water Company to the vestry, the scale of the section varying from 9d. to 6d. per 1,000 gallons, with a minimum of 18s. 9d. per quarter, whereas the scale offered by the company was from 1s. 3d. to 8d. per 1,000 gallons, with a minimum of 2*l*. 10s. per quarter. The scale as contained in the above section was pointed out to the company, and they had been asked to supply water for road purposes on the scale given in the section; but this the company had declined to accede to, and they insisted upon the higher scale before set out. Under these circumstances, the committee thought it right to be advised by counsel on the powers of the vestry to enforce an equitable arrangement by meter against the two companies, and a case was accordingly laid before Mr. Poland, and he had advised that, under the combined operation of the company's special Acts, the Waterworks Clauses Act, 1847, and the Railway Clauses Consolidation Act, 1845, the vestry could have the rates settled by a police magistrate, and they recommended that the clerk be authorised to instruct Mr. Poland to appear on the summons. Should the decision of the magistrate be in favour of the vestry, the committee then recommended that similar proceedings should be adopted against the Lambeth Waterworks Company.

Mr. Dunkin, in moving the adoption of the report, stated that the committee had experienced great difficulty in dealing with the water companies, who had shown considerable reticence in regard to the questions put to them. Of course the companies had a great objection to the proposed alteration, particularly in regard to the adoption of the meter system, which would tend to reduce the receipts of the companies from 3,000*l*. to about 1,000*l*. per annum, as far as the parish was concerned. The parish was at the present time assumed to be using 40 millions of gallons of water annually; but really there was no reliable record of the quantity consumed. The parish of Newington had lately adopted the meter system, with the result that the amount paid for watering the streets was reduced to something like 380*l*. per annum. As a matter of fact, the cost of the water consumed by Newington was 13*l*. per mile, while Lambeth Vestry paid at the rate of 25*l*. per mile. If the vestry adopted this recommendation of the committee, they would, while reducing the cost of road-watering, really know what they paid for.

The report was adopted.

Bristol Tramways.—The directors have accepted the tender of Mr. A. Krauss, contractor, &c., Bristol, for laying the new double line between the city and suburb of Redland, about three miles and a quarter, of single tramway. Mr. Kincaid, of London, is the engineer for the same. The works will have to be commenced in six weeks, and finished within nine weeks from the commencement. The contractor (Mr. Krauss) is already well known in connexion with the lines constructed at Bristol, Bath, York, &c.

STRAIGHTENING THE SPIRES OF THE ST. MARIENKIRCHE AT LUBECK.

The St. Marienkirche or Church of St. Mary is beyond question the finest of all the sacred edifices in the ancient Hanseatic port and free city of Lubeck. It was erected in 1304, and is built of brick in that particular Gothic style which is frequently met with on the shores of the Baltic. The church has three naves, the central one being of the unusual height of 127 ft. The two towers, which form so conspicuous a feature of the city, are no less than 407 ft. high. For some time past these have required new roofing, but before the work was commenced it was determined, after much discussion, to perform on them a preliminary operation of a somewhat hazardous and uncommon description. Every visitor to Lubeck will have noticed that the two spires are tilted very considerably out of the perpendicular. The height of the tower from the ground to the commencement of the spires is 190 ft., while to the top of the spires the distance is 217 ft. further, making the total elevation as above stated, 407 ft. The top of the southern spire has for years inclined to the south and west. The deviation from the perpendicular was 12 ft. towards the south and 9 ft. to the west. The rafter work dates from the year 1350. The operation which it was decided to attempt was to bring this spire into its original vertical position Not a few professional men predicted that the result would be a disaster. However, it was remembered that in the year 1866 a Lubeck builder, Herr Albrecht Grube, had actually performed a straightening operation upon the leaning southern tower of the Lubeck Cathedral with perfect success, and accordingly the authorities were not to be deterred from attempting the same thing with the spires of the Marienkirche. The operations on the southern spire were commenced some time ago, and last week were completed with perfect success. They were carried out by a Lubeck carpenter, Herr Krause, under the direction of a Building Inspector of the city, Herr Schwiening, who promises to publish a detailed description of the method he adopted in executing the work. All that is at present known on this point is that the straightening of the spire was effected by help of a number of small iron screws. In consequence of this success it has been determined to proceed in like manner with the similarly leaning northern spire of St. Mary's.

EXCAVATIONS AT LEWES.

The *Sussex Advertiser* announces that excavations of a highly-interesting character are now on the point of being undertaken in the grounds of the ancient Priory of St. Pancras, at Lewes, under the direction of Mr. Somers Clarke, jun., F.S.A., and under the local supervision of Mr. W. H. St. John Hope, of Cambridge, whose name is well known to antiquaries. The researches promise to be of national interest. The Priory of St. Pancras, founded by William de Warrene and Gundrada, is one of the most ancient specimens of Norman architecture in this kingdom. Considerable historical interest attaches to the building, partly on the ground that it is one of the very few houses of the Cluniacal order once established in this county. The Cluniacs were noted for the splendour of their appointments, the magnificence of their churches, and the openness of their hospitality. The great Monastery of Clugny, in Burgundy, possessed a church which was exceeded in size by few, if any, in Europe. Its plan presented the unusual feature (in France) of eastern and central transepts; a plan we find in England, at Canterbury, Lincoln, Beverley, and several other places. It is evident that the great church at Lewes was planned in the same way. The foundations of the eastern portion of the great church, and also part of the chapter-house, were laid bare in the year 1847, at the time of the construction of the Brighton and Hastings Railway. The bones of the noble founders were also discovered. Since then nothing has been done. It is, however, sufficiently evident, from an examination of the remains, and a comparison with others of a somewhat similar nature, that beneath the surface must lie a large portion of the nave and choir of the church, together with the bases of the western towers; also the substructures of the dormitory, refectory, infirmary, and other important adjuncts connected with a monastery of the first importance. A rough description, by Portenari, who superintended the demolition of the church in 1537, gives a list of the number of pillars and the dimensions of certain parts of the building. It is now intended to open up the rest of the ruins. The work will be watched with keen interest by archæologists. Mr. Somers Clarke appeals for funds to enable him to carry out the undertaking. Considering the national importance of the excavations, such funds ought to be forthcoming from a wider area than the county which they immediately concern. The Society of Antiquaries and the Sussex Archæological Society would probably help.

THE GREAT INTERNATIONAL FISHERIES EXHIBITION, 1883.

This exhibition, the preparations for which are now being vigorously pushed forward by influential and energetic general and executive committees, promises to be fully worthy of its title, as above set out. It has for its patron her Majesty the Queen, and for its president H.R.H. the Prince of Wales. The long list of distinguished and representative vice-presidents is headed by H.R.H. the Duke of Edinburgh, who, it need hardly be said, takes a special and active interest in the undertaking. The scope of the exhibition is wide, embracing as it does everything relating to the culture, preservation, capture, curing, transport, sale, and consumption of fish. In connexion with recent discussions as to fish-market accommodation in London and elsewhere, we have lately been assured that "the harvest of the sea" is practically unlimited; nevertheless, we know that fish is not always obtainable in the market at so cheap a rate as could be desired for so important a food-staple. The coming exhibition is eminently calculated to promote a better state of things in this respect, and therefore we need scarcely bespeak for it the best consideration of our readers.

The Exhibition will include, in Section I. of Class I., ships and boats of all kinds coming under the denomination of fishing craft (shown by models or otherwise); fishing gear, tackle, and appliances; models of harbours, piers, or slips for fishing purposes; appliances and methods for breaking the force of the sea at the entrances of harbours and elsewhere; methods of protecting submarine cables from injury by fishing operations; and a number of other matters connected with sea-fishing too numerous to mention here. Section II. of the same class is assigned to fresh-water fishing. Class II. will seek to illustrate the economic condition of fishermen, and will include models and plans of dwellings for those "toilers of the sea." Class III. will exemplify the commercial and economic aspects of fisheries and industries connected therewith, and will include models of fish-curing establishments, methods of preserving, packing, and cooking fish, and numerous illustrations of the industrial uses to which what may be called "residual products" can be put. An important division of this class will be that concerned with the sale and transport of fish, embracing as it will all kinds of appliances for carrying fish and for preserving it during transport or otherwise, together with models and plans of fish-markets and their accessories. Class IV. will be set apart for fish-culture, and will illustrate, partly by models and drawings, the varieties of fish hatching, breeding, and rearing establishments, with all apparatus and implements connected with the same. Class V. will be allotted to natural history; Class VI. to the history and literature of fishing, fishery laws, and fish commerce; while Class VII. will comprise loan collections coming within the scope of any of the foregoing classes.

It is proposed that the exhibition shall be opened on May 1st, 1883, in part of the Horticultural Gardens, South Kensington, and the surrounding International Exhibition Galleries. The exhibition is to remain open for not less than six months. There seems to be ample justification for the adoption of the word "International" as part of the title of the exhibition, for we learn that the Government of the United States, recognising the importance of the objects in view, has voted a fund of $50,000 for the expenses of the American section of the exhibition, and has applied for a space of 10,000 square feet. The Government of the Netherlands and that of Norway and Sweden have also promised their earnest co-operation. From the

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colonies, too, satisfactory replies have been received, especially from Canada and New Zealand, these colonial Governments having each already voted a grant in aid of the objects of the exhibition.

Conferences are proposed to be held for the purpose of reading and discussing papers or essays on subjects connected with the Exhibition, and a considerable number of money prizes are offered for prize essays on certain specified subjects. In addition to the gold, silver, and bronze medals and diplomas of honour which will be awarded to exhibitors, a large number of special money prizes will be given for specific objects. A list of these, as well as of the subjects for prize essays, together with the regulations to be observed by exhibitors, may be had by those interested on application to Mr. J. W. Mollett, Secretary to the Executive Committee of the Exhibition, 24, Haymarket. Mr. Mollett, it should be stated, has been appointed secretary in consequence of the resignation by Sir B. T. Brandreth Gibbs of his executive functions as director and secretary, but the Executive Committee express their pleasure that they will have the benefit of his assistance and advice as one of the vice-presidents of the Exhibition.

FULHAM INFIRMARY.

At the last meeting of the Fulham Board of Guardians, a letter from the architects, Messrs. Giles & Gough, was read, stating that their plans would be ready next week, and asking whether they should be sent on to the Local Government Board before coming before the Guardians. It was decided that the plans should go at once to the Local Government Board.

Twenty-five applications were received for the post of quantity surveyor for the new building, including several from provincial surveyors. Messrs. Maughan & Cuxson offered to do the work for ½ per cent.; Messrs. Strudwick & Mennie for ¾ per cent. (or a lump sum of 250*l.*); Mr. Wall, Mr. Withers, and others for ¾ per cent.; Mr. Jackson, Mr. Davis, and others for 1 per cent.; and Mr. Hisben for 1¼ per cent. Most of the remainder did not name any rate. The Board, having resolved that the remuneration should be at the rate of not more than 1 per cent., the following six firms were selected for voting upon:—Mr. Jackson, Messrs. Lansdowne & Harris, Maugham & Cuxson, F. Miller, Quilter & Hardcastle, and Strudwick & Mennie.

The choice ultimately fell upon Messrs. Quilter & Hardcastle, who were appointed subject to their agreeing to carry out the work at a charge not exceeding 1 per cent. upon the outlay.

ABERDEEN.

Art Gallery.—At a special general court of the president and governors of Robert Gordon's College, held on the 4th inst., the president—Lord Provost Esslemont,—made an official statement of procedure relating to the steps which are being taken for the establishment in Aberdeen of an art gallery and museum, observing that the Finance Committee of the Art Institution had got together a sum of 10,000*l.*, and that they considered themselves in a position to proceed with the erection of the building. The question was considered by the gentlemen present in an informal way, the result being that the governors resolved to communicate with the Museum Committee on the subject in order to ascertain whether they desired to feu ground, and if so to what extent, upon the property belonging to the college.

Proposed City Improvements.—At the meeting of the Town Council on the 7th inst., Lord Provost Esslemont, who presided, moved that it be remitted to the Improvement and Finance Committees to consider and report as to the propriety of making application to Parliament in the ensuing session for a City Improvement Bill, also as to the improvements to be included in the scheme and the means of defraying the cost. In the Improvements Bill referred to is embodied a scheme for a considerable extension of the city boundary, and for the construction of several new thoroughfares in different parts of Aberdeen. Provision is made for the construction of a wide street towards the Aberdeen Links, in direct line with Castle-street, at the junction of which with the Links it will verge into a roadway encompassing the present racecourse, and leading by a drive to the north pier on to Donmouth and Bridge of Don. This drive was suggested some five years ago by Sheriff Dove Wilson as part of a scheme of improvements laid before the St. Nicholas Association, as to whose objects we have informed our readers. The proposed carriageway along the bank of the Dee, from the Suspension Bridge to the Allanvale Cemetery, is another feature of the scheme. It is also proposed to ask powers from Parliament for the widening of Schoolhill, and for the construction of a broad street carried on a viaduct to the northern end of Union-terrace. In submitting his motion, Lord Provost Esslemont said he thought no city that had gone on making good lines of thoroughfare had ever regretted doing so. At one time a considerable expense had been brought on the city by the carrying out of the magnificent scheme for the making of Union-street, which was constructed at a very great cost, but he was sure there was now no citizen who did not consider that it was the very best thing that could have been done. Other large towns had been moving in this direction of city improvements, and Aberdeen should not lag in the rear. Baillie Donald seconded the adoption of the motion, which was unanimously approved.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

3,719. W. H. Avis, Polegate. Folding seats. August 4, 1882.

3,737. B. J. B. Mills, London. Ceramic composition. (Com. by F. Gillet, Paris.) August 5, 1882.

3,741. A. Bouquié, Paris. Manufacture of bricks, tiles, pavings, &c. August 5, 1882.

3,749. A. M. Clark, London. Fabric for wall-hangings, &c. (Com. by A. Hutchinson, Paris.) August 5, 1882.

3,758. A. R. Harding & J. W. Harding, Leeds. Apparatus for the ventilation of railway carriages and buildings, &c. August 7, 1882.

3,775. J. C. Blomfield & J. McGurn, Fermanagh. Manufacture of bricks, tiles, or slabs. August 8, 1882.

3,783. B. D. Healey, Brighouse. Asphalte apparatus. August 9, 1882.

3,793. J. S. Willway, Bristol. Door mat and scraper combined. August 9, 1882.

3,811. C. H. Southall, Leeds. Apparatus for cleaning windows. August 10, 1882.

3,816. H. J. Haddan, London. Stoves. (Com. by D. M. Graham, Massachusetts, U.S.A.) August 10, 1882.

3,817. H. J. Haddan, London. Apparatus for securing doors and windows against burglars. (Com. by W. Kilian, Berlin.) August 10, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named:—

August 8, 1882.

1,652. J. J. Wheeler, London. Curbs of roads and footpaths. April 5, 1882.

1,655. H. Conolly, London. Waterclosets. April 5, 1882.

August 11, 1882.

1,695. C. H. T. Beamish, Queenstown. Construction of breakwaters, retaining-walls, &c. April 8, 1882.

3,353. G. Dalton, Leeds. Brick-making machinery. July 14, 1882.

ABRIDGMENTS OF SPECIFICATIONS.

Published during the Week ending August 12, 1882.

5,725. M. B. Nairn, Kirkcaldy. Manufacture of linoleum.

This machine automatically mixes the cement and ground cork in specified proportions. Dec. 30, 1881. Price 6d.

5,747. A. M. Clack, London. Roofs and coverings for protection of buildings in course of construction, &c. (Com. by A. C. de Barbaran, Paris.)

Light vertical iron stancheons are erected outside the walls, so made that as the wall is raised the stancheons can be lengthened. These support a roof which travels in guides on the stancheons, and is raised by chains as required. The stancheons can be clamped to the walls to support them. Dec. 31, 1881. Price 8d.

30. W. W. Hughes, London. Fire-grates.

The basket has bars all round, and an air-flue is formed round the back and sides to support combustion. (*Pro. Pro.*) Jan. 3, 1882. Price 2d.

33. S. L. Hunt, London. Street-cleaning and sweeping apparatus.

This consists of a horizontal cylinder from which a segment is cut on one of the surfaces of which is a metal plate and on the other an india-rubber plate. These are brought to bear on the ground as required. Jan. 3, 1882. Price 4d.

42. E. G. Lakeman, Modbury. Stoves and furnaces.

The products of combustion are conveyed from the fire through a flue which passes down outside the stove, and up again through the fire. The flue is here perforated and the smoke, &c., is consumed. Jan. 4, 1882. Price 6d.

54. J. Wetton, Abergavenny. Chimney-pot.

This consists of two cylinders, the internal one forming the smoke-flue. The outer cylinder is longer than the other, and is raised a little at its base so that a current of air is induced upwards into the space between the two cylinders. (*Pro. Pro.*) Jan. 5, 1882. Price 2d.

76. J. H. Johnson, London. Domestic fireplaces. (Com. by M. Perret, Paris.)

These consume anthracite coal. The back and sides are solid, and a loose slab is arranged in close proximity to the upper surface of the fuel, leaving only a narrow slit in the fore part of the fire-place for the escape of gas to the chimney. This slab can be raised or lowered as required. The upper part of the front of the grate is closed by a mantle. Jan. 6, 1882. Price 6d.

81. J. L. Fordham, London. Preparation of materials for facilitating the preparation of whitewash and distemper.

The materials are size, glue, gelatine, and whiting, which are mixed in a powdered state, and can be made ready for use by adding water. Jan. 6, 1882. Price 4d.

96. S. Collett, Willenhall. Lock and latch spindles.

To enable the spindle to be used for doors of different thicknesses, both ends have threaded angles, and when the handles are screwed on, a screw passes through the handle, and the spindle into the opposite side of the handle. (*Pro. Pro.*) Jan. 7, 1882. Price 2d.

112. H. J. Haddan, London. Apparatus for making bricks. (Com. by L. Jäger, Ehrenfeld, Cöln, Germany.)

This machine is actuated by hand power. Three boxes are arranged radially round a vertical post, and a long lever presses the brick in one box while it lifts a brick out of the second. At the same time the third box is being filled. The lever is then lifted, and the form turned round by hand, bringing another brick to be pressed. (*Pro. Pro.*) Jan. 9, 1882. Price 2d.

121. A. C. Engert, Bromley-by-Bow. Stoves or fire-grates.

The fuel-holder is in form of half a barrel divided longitudinally, and is mounted on pivots so that it can turn on a horizontal axis. Bars are placed in front of the grate. The holder is completely filled with fuel which is lighted at the front, and as the fuel burns away, the fuel-holder can be turned. Jan. 9, 1882. Price 6d.

209. T. R. Shelley, Smethwick. Glazing greenhouses, conservatories, &c.

The glazing bar has a middle vertical web rising above the glass. In the lower supporting jaws are grooves for receiving vulcanite or other packing, on which the sheets of glass rest. Loose stops are passed through the web and can be turned down to hold the glass. Jan. 14, 1882. Price 10d.

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street,

THE GERMAN BRICK-MAKING INDUSTRY.

Over-production of bricks has been a source of complaint amongst the brickmakers in the neighbourhood of Berlin, and a meeting was held some weeks ago to devise a remedy for this acknowledged evil. General approval was expressed of the suggestion made that the cessation of work for the season should take place on September 15th, being one month earlier than usual. By this means the equilibrium of demand and supply might be restored, it was considered. A committee was appointed to deal with the question in detail, and to report to another general meeting of the trade to be held at an early date.

PRIZES FOR ARCHITECTS.

Sir,—I think the following is worthy of a space in your miscellanea as a companion advertisement to that of the Guardians of the Kidderminster Union. In my opinion (if anything) it surpasses in audacity and cool impudence anything yet published. And (as you put it) this conduct can only be justified by the fact that the invitation has been responded to.

The building for which plans are invited will cost at least 2,000*l.* Thomas Kissack.

"TO ARCHITECTS.

THE Guardians of the Ormskirk Union are desirous of receiving COMPETITION PLANS for buildings to be used as Vagrant Wards, Relief Offices, and Dwellings for Officers.

First prize, 5*l.* 5*s.*; second prize, 2*l.* 12*s.* 6*d.*

All the plans sent in to become the property of the Guardians.

The ground plan may be seen and further information on application at No. 53, Sefton-street, Southport.

Plans to be delivered on or before the 1st AUGUST next, at 53, Sefton-street, aforesaid.

WILLIAM PARR,
Clerk to the Guardians."

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THE HYDE PARK CORNER IMPROVEMENT SCHEME.

In the House of Commons on Saturday last, on the resolution authorising the vote for the Royal Parks and Pleasure-grounds,

Lord Elcho said that this vote of 3,000*l.*, though it came under the general head of Royal Parks, was practically for the removal of the reservoir at the west end of Constitution-hill as part of the plan for the improvement of Hyde Park Corner. The question was where the reservoir was now to be placed, and until the House knew that it would be sanctioning a vote of which it did not know the meaning. He believed it was intended to place it in Hyde Park, where for a long time to come, until it was covered by trees, it would necessarily be a most unsightly object.

Mr. Shaw-Lefevre said that it was intended to remove the reservoir to Hyde Park, but the actual spot was not yet settled.

Lord Elcho said that was exactly the fault that he found with the proceedings of the Government. The whole plan should have been settled and explained to the House before the vote was asked for; but, as things were, the House was called upon to sanction a plan without an opportunity of considering it. As far as he could judge, the proposal of the right hon. gentleman would fail to diminish the plethora of traffic at Hyde Park Corner, would disfigure rather than embellish that part of the metropolis, and, if it did not succeed, would do irremediable damage. The stoppages in the traffic were at Hamilton-terrace and at Hyde Park Corner. The plan of the First Commissioner left the width of Piccadilly from Park-lane to the Corner the same as now, therefore the congestion would not be relieved at all. But after he had gone to the expense of a model and of plans, and had got the promise of 20,000*l.* from the Metropolitan Board of Works, and of 3,000*l.* from the Duke of Westminster, he amended his plan. When he had done all, he did not meet the block that had to be dealt with. He had to go to the Board of Works to ask them to widen his plan, thus confessing an oversight on the most important point. The Council of the Royal Institute of British Architects had considered the First Commissioner's model and plan, and they pointed out that there was no indication of an increase of width at Hamilton-place. Although he had since proposed to widen Piccadilly, the extra width would only be that of a footpath, and this was quite inadequate. But even his amended plan would not meet the difficulty. He ventured to call the attention of members to what he denominated a rival revival of earlier plans, and, as the right hon. gentleman would not allow it to be exhibited along with his own, he had obtained permission to place it in the cloak-room, where lithographed copies might be obtained. This combination of plans was to be found in the office of the First Commissioner. If it were tried and failed, there was nothing in it to prevent the ultimate adoption of the right hon. gentleman's plan. It divided itself into two parts. On the north of Piccadilly there would be a new road in the park from Stanhope-gate to the Corner, and the present road, with a new opening into Park-lane, would be made a street outside the Park. South of Piccadilly from Hamilton-place a new road would be made to Grosvenor-place, and at the intersection of Constitution-hill there would be a bridge. A temporary bridge might be constructed for a trial, and the permanent structure might be made as ornamental as possible. This plan would leave the reservoir and the Arch untouched, and it would relieve both Hamilton-place and Hyde Park Corner, giving a continuous route to traffic from the north to Victoria Station and the East. The plan he recommended would be an ornamental one, and would greatly facilitate traffic. By it the Duke of Wellington's arch would remain untouched, and the hospital would not be interfered with.

Mr. Shaw-Lefevre said that the removal of the reservoir had long been considered desirable. It supplied the public offices with water, and it was expedient to increase the pressure of water by removing it to a higher point in Hyde Park. It would not be a disfiguring object, as it would be almost wholly concealed from sight. With respect to the main part of the scheme, he must remind the House that this subject had exercised the minds of successive Commissioners and of the House for many years past. When it became his duty to deal with it, he had come to the conclusion that that which he proposed was at once the boldest and the most certain to afford a remedy, and the most likely to obtain the various consents. The essential feature of that plan was the cutting off the corner of the Green Park in a line from Hamilton-place to Halkin-street, and the promotion of an open *place* in which as many roads could be made as would properly distribute the traffic and remove the block. It was one condition of the plan that the Wellington Arch should be removed from its present position to the point at which Constitution-hill in future would meet the open *place*, about 100 yards to the south of its present situation, where it would form the royal entrance to the Green Park. It was said by some that the general features of the scheme could be carried out without the removal of the arch. That was not so, first, because if the arch were left where it was, it would not be possible to widen the upper part of Grosvenor-place, and without this widening the block could not be removed; and secondly, because, if left in its present position, the gradients or other conditions would require that the road between the two parks should not pass under the arch, but round one side of it, and through one of the side gates into Hyde Park, and thus all the dignity of the approach and the meaning of the arch would be lost. The noble lord had objected that the arch in its new position would not be square with the gateway to Hyde Park and to other buildings. This was true; it would be at right angles to Constitution-hill, but would not be parallel or at right angles to other buildings. This might be a serious defect if it were at all near to other buildings, but it would be at a considerable distance, and would no longer be a part of the group of arches at the entrance of Hyde Park. He had very high artistic authority for saying that the effect would not be bad, but, on the contrary, decidedly good. The word askew was a formidable one, but there was no canon of art against buildings being askew to one another; on the contrary, the greatest artists in architecture the world had known,—namely, the Greeks,—were of an opposite opinion; they rather avoided placing buildings at right angles or parallel to one another, and in the Acropolis he need hardly remind hon. members that the group of buildings the most celebrated in the world were purposely not placed at right angles or parallel to one another. The noble lord had called to aid the Institute of Architects, and had claimed that they had condemned the official plan. It was true that some days ago the council of that Institute came as a deputation to him and presented to him an alternative plan prepared by their secretary. They told him, however, that they were not united on the subject, and he had no difficulty in proving to them that there were more serious objections to the plan of their secretary, and they left him under the impression that the majority of them were convinced. They subsequently sent a deputation to the Metropolitan Board with another plan, but this again was open to other objections, and the Board unanimously declined to adopt it. The noble lord seemed to think it a serious matter that the Institute of Architects should express an opinion. He could not, however, accept their council as an arbiter in such matters. Till the present time, the Institute had never undertaken to advise the Government or the public in such questions. But, though he had not consulted the Institute of Architects in its collective capacity, he did not adopt this scheme without taking advice from a great number of persons well qualified to give opinion. He did not hesitate to say that it had been approved of by the great bulk of persons who were qualified,—by such men as the late Mr. Street, Mr. Waterhouse, Mr. Fergusson, the well-known writer on architecture, Mr. Holford, and numerous others. It had also been approved by her Majesty the Queen, who had been graciously pleased to give up a small part of the garden of Buckingham Palace. It had also been approved by the Metropolitan Board, who find the main portion of the money, and by the public Press generally. He, therefore, ventured to hope the House would not support the noble lord in his desire to postpone the scheme. It was his conviction that if this plan were postponed no other alternative would be more fortunate or more acceptable, and the only result would be that the difficulty would remain for an indefinite period unsolved and without a remedy.

Mr. Craig approved the plan of the First Commissioner of Works.

Mr. Peddie thought that, as far as the question of relieving traffic was concerned, the plan of the noble lord was the better of the two. His chief objection to the Chief Commissioner's plan was that the *place* which it would create would be cut up into too many small plots and gardens. The plan, however, might by some modifications be made much more acceptable.

Mr. Warton urged that further time should be allowed to consider this matter. There was no reason why the Chief Commissioner should press the matter on now.

The resolution was agreed to.

In the House of Lords on Tuesday,

The Marquis of Ailesbury asked her Majesty's Government whether it was seriously intended to carry into effect the alterations proposed by her Majesty's First Commissioner of Works at Hyde Park Corner; and, if so, when those alterations might be expected to be commenced.

The Earl of Milltown said that he desired to supplement the question of the noble marquis by asking whether, in the event of these proposed improvements being effected, the Government would avail themselves of the opportunity thus afforded to throw open the roadway down Constitution-hill to the public.

Lord Sudeley said that he had to state that immediately the vote was passed by the other House steps were at once taken to commence carrying out the great improvement at Hyde Park Corner. The first thing that had to be done was to remove the reservoir from its present position to a suitable place in Hyde Park; and tenders had already been invited for carrying this out. The First Commissioner had not yet decided whether the arch could be moved in one block on rollers, or whether it would be necessary to pull it down and rebuild it, but it was hoped that this matter would be settled in a few days. The Government hoped that the cutting off the corner of the Green Park would entirely remove the congestion of traffic which had for so long been a standing nuisance to that part of the metropolis, and they believed that, of the numerous schemes which had been suggested, this formation of a large *place* would be the boldest and happiest solution of a somewhat difficult problem. It was not proposed at present to open Constitution-hill to the public. The question had not been under consideration.

The Duke of Cambridge said that he was very glad that what was now proposed was to be carried out; but he was convinced that the block in the traffic at Hyde Park Corner would never be got rid of until a subway had been made from Hamilton-place, under Piccadilly, to Grosvenor-place.

The Earl of Redesdale asked whether it would not be possible to place the statue of the Duke of Wellington on a pedestal opposite to Apsley House.

Lord Sudeley said that the First Commissioner had received a great many representations respecting what should be done with the statue of the Duke of Wellington. Among many conflicting opinions, he has not yet decided what would be best to be done; but, if the arch were obliged to be pulled down, then he would take care that experiments were made to see how the Duke would look on a pedestal in the middle of the proposed "place" or similar position. If the arch were not pulled down, but were rolled into its new position without having to take down the statue, then it was probable it would be better to leave it alone. The matter was, however, still under consideration.

THOMAS EDWARDS, ARCHITECT.

Sir,—In reply to a recent communication of mine, which you were good enough to insert in the *Builder*, I have now the pleasure of stating that I am indebted to the courtesy of Mr. Thos. Ferris, of Rosewyn, Truro, for the information that Thomas Edwards was an architect from London, who built one or two mansions in Cornwall, including Tehidy, the seat of the Bassets, in the early part of the last century, and the fine house once belonging to Mr. Wm. Lemon, in Prince's-street, Truro. He was also the architect of the very indifferent spire and west front of St. Mary's Church, Truro, now removed to make room for the new cathedral there. It may interest some of your readers to know the foregoing.

Walter H. Tregellas.

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THE ANCIENT MONUMENTS BILL.

In the House of Commons, on Tuesday, on the motion for going into Committee on this Bill,

Mr. Beresford Hope said he trusted this was the last time when the memorable words "Ancient Monuments Bill" would be in the paper. He congratulated his hon. friend the member for the University of London on his great success. For years he had fought by the side of his hon. friend. There was a great deal of misunderstanding about the Bill. He thought the most ridiculous of all arguments raised against it was that it was a destructive measure, for it was absolutely the most conservative measure ever brought before Parliament. It would preserve monuments of immense value from the effects of wilful ignorance and selfishness. The Bill had made its way slowly, but surely, and he was sure that when it was put in the Statute-book it would be hailed with satisfaction.

The motion was then agreed to, and the House went into Committee on the Bill.

Clause 1 was passed. On Clause 2, Mr. Shaw-Lefevre moved to add an amendment to the end, providing that the cost of the maintenance of ancient monuments should, subject to the approval of Her Majesty's Treasury, be defrayed out of moneys provided by Parliament. The amendment was agreed to, and the clause was added to the Bill.

On Clause 3, Mr. Shaw-Lefevre moved an amendment empowering the First Commissioner of Works, with the consent of the Treasury, to purchase out of moneys to be provided by Parliament any of the ancient monuments to which the Bill applied. The amendment was made, and Clause 3, as amended, was agreed to.

Clause 4 was added to the Bill, and Clause 5 was struck out. Clauses 6 and 7 were agreed to without amendment. Clauses 8 and 9 were amended and added to the Bill.

Mr. Shaw-Lefevre then brought in a new clause in place of Clause 5, and providing for the appointment of an Inspector of Ancient Monuments. The new clause was added to the Bill.

Sir J. Lubbock moved a new clause, authorising the Crown, by Order in Council, to apply the Act to any other monument of the same character as those in the schedule. The schedule, he said, was adopted from his Bill, and had been carefully drawn up by very high authorities. But it was only typical; it never pretended to be a complete list. A power of addition had always been contemplated, and his right hon. friend had kindly intimated to him that he would accept the clause.

Mr. Shaw-Lefevre said that he quite approved the new clause. It only applied to monuments of a "like character" to those in the schedule to the Bill.

The new clause was added to the Bill.

On the schedule, Sir J. Lubbock moved an amendment, standing in the name of the hon. member for Donegal, to include in the schedule the earthen and stone enclosure known as "Grianan of Aillach," in the parish of Burt and barony of West Innishowen, county Donegal. The amendment was agreed to, and the schedule was passed.

The Bill, as amended, was reported to the House, and was then read a third time and passed.

TREATMENT OF ARCHITECTS.

Sir,—I wish to bring before your notice the following facts (for what they are worth), if you care to make use of them, acting only with a view to the benefit of my profession.

It is the old story. A few weeks ago a competition was announced in your paper for a new club at Bury St. Edmund's, with the usual invitation to compete, and stating that plan of site and instructions could be obtained by applying to the secretary.

This advertisement was not continued in the following week's *Builder*, and, after application having been made more than once for the said instructions, would-be competitors were informed that, owing to the number of applications made, the competition had fallen through, or words to this effect. It since turns out that an Ipswich architect has been introduced by a "young" member of the committee, and who has straight off appointed him as architect.

I have merely to observe,—and perhaps you will agree with me,—that I think this mode of proceeding not creditable. These gentlemen have not only made use of your paper for no purpose, but have deceived architects generally. M.

LABOUR IN AUSTRALIA.

The following is an extract of a letter from Nelyambo, New South Wales, dated June 11th, 1882. May I advise "One not Blessed with Incumbrances" to go to Australia?

E. Scott.

"We want people at home to be better informed as to the resources of these colonies, and to be impressed with the fact that there is a good field for any amount of capital. And another thing we want is the stoppage of your present plan of shipping your 'ne'er-do-weels' out here; they are of no use to the colonies, and only go to the dogs at an increased pace. And another point people at home must learn is that this is by no means an El Dorado, where any fellow with a good education and *nothing else* can at once make his way. *Send us good steady skilled operatives in thousands*, but keep your surplus 'gentlemen' at home, or, rather, make them mechanics and then send them out here prepared to work with their *physical* powers. But men with education only and *no capital* are at a large discount, and every steamer makes the discount larger. We want good labourers and mechanics."

RAILWAY FARES.

Sir,—Apropos to and in illustration of your remarks on railway fares and cost of passenger transit being dependent upon long running with few stoppages, and *vice versâ*, I may mention that Messrs. Cook advertised an excursion by the Midland, from Birmingham to Scarborough and back for 5s. on Bank Holiday, a distance of 173 miles each way, or 346 miles in all, or at the rate of six miles a penny nearly. The journey out was performed in six hours, or one hour under express time, and the return journey in seven hours,—including a stoppage of nearly an hour close home on account of insufficient accommodation at the station, and consequent crowding of trains,—and without a hitch; 2,500 persons availed themselves of the opportunity of spending ten or eleven hours on the sea-coast on that occasion, and I doubt not at a considerable profit to their health and to the pockets of the promoters. I can answer for one.

E. Grimes.

BUILDING CONSTRUCTION.

Sir,—Walking out the other day, "our custom of an afternoon," we found ourselves on the outskirts of the Regent's Park, and at a garden gate we observed a curious pair of pilasters or piers, "for each seemed either." They were of that chocolate colour now so common, which gives the spectator a pleasing doubt whether the material intended is wood, stone, marble, or what else in nature or art; and upon a second glance we noted a peculiar unevenness of surface. Going near to examine, and sounding them, we found that these piers were encased with zinc, somewhat warping in the sun, and having their exteriors painted in the aforesaid chocolate with good oil and lead colour. This new form of building construction may be a hint to many, and, if duly developed, may cause this century in future times to be known as the "age of zinc," although it has been suggested in view of the present great trade in imported provisions that tin may dispute the honour. H. & R. Powell.

NEW WORKHOUSE BUILDINGS, ST. PANCRAS.

The Board of Guardians having intimated that they would themselves appoint the quantity surveyor, the Workhouse Accommodation Committee met on the 8th inst., and, after considering the qualifications and standing of the applicants (about twelve in number), selected the three following firms as fully entitled to the confidence of the Board, viz., Messrs. Maughan & Cuxson, Messrs. Sandall, Corderoy, & Farthing, and Messrs. Stoner & Sons, the votes obtained by each firm being nine, eight, and seven respectively.

The Committee's report was presented to the Board on the 10th inst., when Messrs. Sandall, Corderoy, & Farthing were appointed. The total outlay contemplated is about 100,000*l*., and the surveyor's charge allowed by the Board is 1½ per cent.

CHURCH-BUILDING NEWS.

Kennington.—Mr. W. Grantham, M.P., recently laid the foundation-stone of a new mission church in Pilgrim-street, Upper Kennington-lane. The building, which will accommodate between 400 and 500 people, is intended to supplement the ministerial work carried on in the parish of St. Mark's, Kennington, by the Rev. Mr. Montgomery, the vicar, and the Rev. Tilden Smith, his curate. A freehold site has been secured adjoining the gas-works, and the cost of the building, inclusive of the price of the land, will be about 1,800*l*. The building will be composed of red bricks and picked stocks. It will comprise a vestry and two class-rooms,—the latter being capable, when occasion demands, of being thrown open so as to augment the accommodation of the chief room, which will be 55 ft. 6 in. in length by 28 ft. broad. The architect is Mr. W. H. Harrison, the builders are Messrs. Andrew & Nanson, of Brixton, and Mr. Handley is clerk of the works.

Worthing.—The foundation-stone of a new church at Worthing, to be called Holy Trinity Church, was laid on the 10th inst. in the presence of a large number of spectators, by Mrs. Loder, wife of Mr. R. Loder, M.P. The church will be erected of red brickwork, both inside and out, with Bath stone dressings, and red tile roof; it is to be in the Early English style, and will have a tower and spire as soon as funds will allow of its entire completion. The dimensions of the church are as follow:—the length of the nave is 69 ft. 2 in., inside measurement; chancel, 28 ft. 5 in. long; width of church, inside, from aisle to aisle, 60 ft.; and the height from the apex of the main roof to the floor line is 48 ft. The architects are Messrs. Coe & Robinson, 4, Furnival's Inn, London; the builder is Mr. Peters, of Horsham; Mr. S. R. Smith, A.R.I.B.A., is acting as clerk of the works.

Sedgley.—On the 8th inst. the foundation-stone of the new chancel for the Church of St. Mary the Virgin was laid by Mr. Alfred Hickman. The church has been built about twelve years, a temporary erection having been used for a chancel. On the north side of the chancel space is left for an organ-chamber, and on the south side for two vestries. At present only the chancel is being proceeded with, and this will afford space for eighty sittings. The erection will be in keeping with the church, of red bricks, faced with Gornal stone. At the east end there will be a tracery window erected at a height which will allow of a handsome reredos being placed below it. The work is being done by Messrs. J. Jones & Son, Sedgley, from plans by Mr. T. H. Fleming, Wolverhampton. The total cost of the chancel will be 800*l*.

VARIORUM.

"A Handbook of the Industries of the British Isles and the United States," by G. Phillips Bevan, F.G.S. (Bogue), though a small book, treats clearly a large subject. The object of the work is to explain in simple language the resources and industries of each country together with the physical and geographical causes that have led to their existence. Mr. Bevan is a practised writer, and has his subject well in hand.——"Sanitary Houses and How to select One," by F. A. Bond, M.B. Edin. Univ. (Kegan Paul & Co.), is clearly written, but very slight. After all that has been said and written on the subject, so superficial and slight an essay should not be necessary; however, as there are possibly still persons to whom it may serve as a first awakener we willingly recommend it as well adapted for that purpose. We have been saying the same things as will be found in the pamphlet for these thirty years and more, and cannot have too many assistants in the good work.——*Nature* is a weekly illustrated journal of science (Macmillan & Co.), and those who read it regularly will find themselves acquainted with all that is new in science. It well deserves the position it has attained.——*Knowledge*, conducted by R. A. Proctor (Wymans), goes on agreeably and well. Those who supposed at its starting that "stars" would too greatly prevail have ceased to think so. Everything is touched in turn, and touched with knowledge. When we find the editor quietly replying to a correspondent, "I fear it would be difficult to prove that diamonds are condensed comets," we have a good indication of his patience.—— Harper's *New Monthly*

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includes under the title "Lying in State in Cairo," a full and illustrated account of the recent wonderful discovery of royal mummies and their deposition in the Museum at Boulak. Let us hope that the scoundrel Arabi, with his army, may not get into Cairo, or we may have reason to regret that the discovery was made so soon.

Miscellanea.

Electric Light Speculation: a Dividend of 100 per cent.—An extraordinary general meeting of the shareholders of the Anglo-American Brush Electric Light Company was held on the 10th inst. at the City Terminus Hotel, Sir H. Tyler presiding, for the purpose of confirming a resolution passed on the 18th of July, altering the articles of association, and providing that "The directors may from time to time, of their own authority, pay to the members, in proportion to the amount paid up, or credited as paid up, on the shares held by them respectively, such bonus and such interim dividends as in the judgment of the directors the position of the corporation justifies." The Chairman formally moved that the resolution be confirmed, and said its object was simply to enable the directors to distribute the sum of 245,000*l.*, which they held at the disposal of the shareholders, and for which warrants had been prepared. That sum would furnish them with the very satisfactory interim dividend of 100 per cent. upon all they had subscribed in the undertaking. Mr. Sellon seconded the resolution. Mr. Hammond hoped the chairman would give the shareholders an assurance that there was no foundation for the statement that the company had made no profit on its manufacturing business, and that its only source of obtaining money was by the sale of sub-concessions. The chairman said that a rough balance-sheet had been prepared, and it was found by that means that there was a profit on their manufacturing business during the first six months of the year of 30,000*l.* He regretted the amount of speculation which had taken place with regard to the sub-concessions. There had been too much speculation going on, and too little real manufacturing work performed. The shares of the company, he also thought, had risen to a higher price than was justifiable. The directors could not control the speculation which was going on, but he would not encourage it by making any prophecy as to the future of the company. The resolution was agreed to.

Art-Union of London.—The pictures selected by prize-holders of the Art-Union of London this year have been placed on exhibition in the galleries of the association, at 112, Strand. There are seventy-one oil-paintings and seventeen water-colours purchased with prizes ranging from 10*l.* to 100*l.* from nine exhibitions,—namely, those of the Royal Academy, the Royal Hibernian Academy, the Royal Scottish Academy, the Society of British Arts, the Grosvenor Gallery, the Royal Society of Painters in Water-Colours, the Institute of Painters in Water-Colours, the Royal Albert Hall, and the Society of Lady Artists. The choice of the prize-winners who have selected these works for themselves has fallen for the most part on sunny landscapes and domestic scenes, the collection including one or two excellent delineations of life on the Thames. The exhibition, which is free on presentation of address-card, will remain open until September 2nd. The print for the current year,—"Stolen by Gipsies: the Rescue,"—is an excellent specimen (engraved by Messrs. C. H. Jeens & Lumb Stocks, R.A.) of the work of Mr. J. B. Burgess, A.R.A. It will, no doubt, prove very popular. The cost of producing it, moreover, will be so much less than was that of the series of prints given last year, that a much larger amount will, of course, be available for the purchase of pictures.

The new Thoroughfare between Charing-cross and Oxford-street.—Steps have at length been taken for making, at all events, a beginning of this long-needed public improvement. The materials of about forty houses about Newport-market having lately been sold by Messrs. Eversfield & Horne, the structures themselves are in process of demolition, and in the course of another month a large portion of the following streets will have disappeared:—Newport-court, Little Newport-street, Market-row, Market-street, Prince's-row, Lichfield-street, Hayes-court, and Grafton-street.

North of England Institute of Mining and Mechanical Engineers.—The annual meeting of members was held in the Wood Memorial Hall, Newcastle, on the 5th inst., the president, Mr. G. B. Forster, in the chair. The secretary, Mr. Bunning, read the annual report of the finance committee, which stated that the finances of the Institute are in a very satisfactory condition. He next read the annual report of the council, which stated that the thirtieth year of the Institute has been one of uniform prosperity, the progress made has been of a permanent and solid nature, showing that the Institute is becoming more and more secured against the fluctuations of the funds derived from subscriptions. There have been many valuable additions to the library, and exchanges have been made with a great number of foreign societies. This has been done to such an extent that few, if any, libraries out of London are in possession of such valuable information respecting the progress of mining science in all countries, and this has enabled the council to publish extracts and translations from such foreign papers as seemed to deserve particular attention, which will materially add to the interest of the transactions. In this the council have been assisted by Professor Lebour, who has devoted much time and attention to this department.

Steam Wheels.—A new kind of steam-engine has been recently patented in Austria by Professor Wellner, of Brünn. The so-called steam-wheel (according to the account in the *Polytechnischer Journal*) consists of a simple water-wheel, mostly immersed in hot water in a closed vessel. Steam is admitted at the lower part, and forces the cells of the wheel upward, producing rotation. The steam fills more and more of the cells on the rising side, and at length begins to escape into the steam space above the water. Steam may either be produced directly at the lower part or conducted to the vessel from elsewhere. The upper tube for outlet of steam may lead either into the open air or into a condenser. The mechanical work consists in the ascent of the specifically lighter steam in the heavier liquid. These steam-wheels may either be used as independent motors or in connexion with ordinary steam-engines; in the latter case the escape steam of one kind of machine is utilised for the other.

The World's Production of Lead in 1881.—Herr Landsberg, the general manager of the Stolberg Company, has, in an annual report to his company, given an estimate of the production of lead in Europe for 1881. The following is Herr Landsberg's estimate for Europe:—Spain, 120,000 metric tons; Germany, 90,000; England, 67,000; France, 15,000; Italy, 10,000; Greece, 9,000; Belgium, 8,000; Austria, 6,000; Russia, 1,500; total, 326,500. Herr Landsberg estimates the production of the United States at 110,000 tons. As the output of Mexico, South America, Canada, and Australia is small, it is probably safe to assume that the world's production is about 440,000 tons of lead. This does not include China, which is a heavy consumer of lead, and is not unlikely a producer of some importance; nor does it include Japan, of whose output we have no figures. It will be seen, therefore, that the United States takes second rank among the lead-producing countries of the world.—*Iron Age.*

Light.—An installation of fifty "Swan" incandescent lamps has just been completed at No. 279, Edgware-road, for Mr. Bowron, provision merchant, who expects to save a great deal from the use of these lights, owing to the absence of heat, which, before these lights were used, caused a great amount of damage. The work has been carried out by Messrs. Edmundson & Co., 19, Great George-street, Westminster, who are also engaged in several much larger installations for several country mansions, where the absence of heat and smoke is also expected to effect a considerable saving.

Cramlington.—Extensive additions and alterations are being made to the Blue Bell Hotel, Cramlington, for Sir Mathew White Ridley, bart., M.P., from the designs and under the superintendence of Mr. J. J. Lish, architect, Newcastle-upon-Tyne.

Timber Burnt at Archangel.—Lloyd's agent at Archangel, writing under date of the 31st of July, states that a large fire occurred on the 19th of July on the timber premises of Messrs. E. H. Brandt & Co., and destroyed all their deal-yards, worth about 30,000*l.*

Exhibition and Competitions at Ghent.—The Chambre Syndicale Provinciale des Arts Industriels was founded at Ghent in 1866, with the object of "stimulating the genius of artistic creation in relation to industrial applications, contributing to popularise the study and sentiment of the beautiful in the production of industrial objects, which derive a portion of their value from their form, so facilitating and encouraging the efforts of industrial artists and artisans in the conception and execution of original works of good taste." For the present year the Chambre Syndicale announces an Exhibition of Industrial Art, to open in the halls of the Ghent Casino, on August 28, and to continue until October 18, following. Like the former, it will comprise two sections:—1. Modern, including: (*a*) a general exhibition of objects of industrial art manufactured in the country; (*b*) competitions in designs for such objects; and (*c*) competitions in manufactured objects. 2. A section of objects anterior to the nineteenth century, relating to industrial art, Belgian or foreign. Besides the prizes in the competition, medals of silver-gilt, silver, and gold, as well as honourable mentions, will be accorded to such exhibits as evince the greatest merit in design, taste, and execution, or which illustrate a new industry; while medals will also be granted to the designers of successful exhibits. Division A (*Building*) comprises (1) ornament in stone, carton-pierre, plaster of Paris, artificial stone, &c.; (2) natural and artificial marbles, pavement, &c.; (3) joinery, including doors and floors. The Président d'Honneur is M. Léon Verhaeghe de Naeyer, Governor of East Flanders; the president M. Constant Verhaeghe de Naeyer; and the secretary, M. Emile Varenbergh, Ghent.

Technological Examinations.—The directors' report of the results of the fourth examination in technology conducted by the City and Guilds of London Institute, has recently been issued. The examination was held on the evening of May 24, when 1,972 candidates presented themselves. From the returns received in November last it appears that 3,467 students were at that time attending technical classes in different subjects under the direction of the institute. As compared with last year, a great increase is observable in the results of the recent examination. In 1881 1,563 candidates were examined at 115 centres in 28 different subjects, of whom 895 passed; in 1882, 1,972 candidates were examined at 147 centres in 37 subjects, of whom 1,222 passed. The difficulty which still exists of finding competent teachers prevents the formation of technical classes in many places where such classes are greatly needed. This difficulty, it is expected, will begin to lessen with the opening of the central institution in Exhibition-road. With the view of lightening somewhat the conditions of registration of teachers, the committee have resolved to receive applications from teachers under the Science and Art Department who can adduce evidence of having acquired in the factory or workshop a practical acquaintance with the subject which they desire to teach. The report calls attention to two great deficiencies in the training of the candidates who come up for examination in technology—to their want of elementary science knowledge and to their want of skill in drawing. Of the 1,222 successful candidates, not more than 400 are entitled to the full certificate as having passed the Department's examination in the science subjects.

TENDERS

For rebuilding the Castle Hotel Tap, Porter's-lane Southampton, for Miss Drew. Mr. E. T. Howell, architect:—

Bailey	£459 0 0
Brinton & Bone	420 0 0
Rowland	400 0 0
Dyer & Son	398 0 0
Crook (accepted)	396 19 0

For steam laundry premises, Hampstead. Mr. F. A. Gosling, architect. Quantities supplied:—

Priestley & Gurney	£2,500 0 0
Hicks	2,320 0 0
Blanford & Co.	2,209 0 0
Trevecke & Co.	2,204 0 0
Niblett	2,195 0 0
Sabey & Son	2,150 0 0
Martin & Goddard	2,133 0 0
Jarvis	2,042 0 0
Jenner & Oldridge	2,040 0 0
Balaam Bros.	2,000 0 0
Richardson Bros.	1,997 0 0
Carpenter & Poole	1,968 0 0
Garraud	1,893 0 0
Sharman	1,790 0 0

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For a sixty-quarter brewery at Tadcaster, with cooperage, drying-shed, stores and offices, boundary walls, &c., exclusive of plant, for Mr. John Smith. Messrs. Scamell & Colyer, architects, 18, Great George-street, Westminster. Quantities by Messrs. R. L. Curtis & Sons, London:—

Contract No. 1.—Building only.

J. Hartley, Birmingham	£28,057	0	0
W. Biscombe, York	26,563	0	0
J. & W. Beanland, Bradford	26,200	0	0
H. Lovatt, Wolverhampton	24,793	0	0
W. Nicholson & Son, Leeds	24,325	0	0
Bentley & Burn, Leeds	24,076	0	0
Illingworth Bros., Bradford	23,844	0	0
M. Wilson, Headingley	23,215	0	0
Lowe & Sons, Burton-on-Trent	23,170	0	0
W. Holdsworth, Bradford	22,658	0	0
Armitage & Hodgson, Leeds*	22,103	0	0
Kell & Chambers, Leeds	19,481	0	0

Contract No. 2.—Girders and Columns.

Head, Wrightson, & Co., Stockton	£14,032	0	0
Laidlaw & Sons, Glasgow	13,993	0	0
Thornewill & Wareham, Burton-on-Trent	13,028	0	0
Handyside & Co., Derby	12,867	0	0
Eastwood & Swingler, Derby	12,061	0	0
Bagshaw & Sons, Batley	11,160	0	0
Dawson & Nunneley, Leeds*	10,699	0	0

* Accepted.

For erecting school buildings at Hanway-place, Oxford-street, for the trustees of the Westminster Jews' Free Schools. Mr. H. H. Collins, architect, 61, Old Broad-street:—

F. Mark	£7,927	0	0
A. E. Robinson	7,836	0	0
J. & J. Greenwood	7,499	0	0
Mowlem & Co.	7,339	10	0
R. Abraham	7,330	0	0
W. Downs	7,327	0	0
Shepherd	7,298	0	0
W. & F. Croaker	7,147	0	0
Kirk & Randall	7,080	0	0
Bentley	7,076	0	0
J. Morter	7,040	0	0
Tongue	6,800	0	0
Sabey & Son (accepted)	6,498	0	0

For repairs and alterations to three houses, St. Luke's. Messrs. Gordon & Lowther, architects:—

Parrish & Hawker	£369	0	0
Symons	350	0	0
Steer Bros.	188	0	0

For alterations to "White Horse," Burdett-road. Mr. J. Hudson, architect:—

Cox	£190	0	0
Brown	188	0	0
Parrish & Hawker	180	0	0
Hearle & Son	165	0	0

For erecting new stables, Bancroft-road. Mr. C. A. Legg, architect:—

Lennard	£987	0	0
Arger	892	0	0
Bodmin	814	0	0
Swan	809	0	0
Pound	779	0	0
Lewin	765	0	0
Bragger	715	0	0
Bradmore	710	0	0
Parker	697	0	0
Sangler	631	0	0
Parrish & Hawker	625	0	0
Collins	620	0	0
Russell	619	0	0
Lusk	600	0	0
Vaughan	597	0	0
Hawkins	590	0	0

For works at Virginia Water (house, stables, cottage), for Mr. J. H. Secker. Messrs. Edgington & Somerbell, architects:—

Harris & Sons, Tunbridge Wells	£3,554	0	0
D. C. Jones & Co., Gloucester	3,542	0	0
Willis, Windsor	3,499	0	0
G. Reavell, Staines	3,391	0	0
J. Norris, Sunningdale	3,383	0	0
Young, Westminster	3,260	14	2
Dredge, Westminster	3,197	0	0
C. Watson, Ascot	3,099	0	0
Martin, Maidenhead	3,092	13	0
Woods, Weybridge	3,014	3	6
A. L. Oades & Sons, Egham	2,915	0	0
J. Pither, Ascot	2,908	0	0
W. P. Reavell, Windsor	2,863	0	0
Kingerlee, Banbury (accepted)	2,849	0	0

For detached house, Edgeborough-road, Guildford, for Mr. Wm. Hunt. Messrs. Peak, Luan, & Peak, Guildford, architects. Quantities supplied:—

Mitchell Bros. Shalford	£1,615	0	0
R. Pink, Milford	1,584	10	0
R. Nye, Guildford	1,552	0	0
A. W. Moon, Guildford	1,538	15	0
G. Strudwick, Guildford	1,535	0	0
Pearce & Clark, Guildford	1,499	0	0
Garnett & Mills, Guildford	1,498	0	0
J. Harris, Woking	1,444	0	0
Martin, Wells, & Co., Aldershott*	1,400	0	0

* Accepted.

For a warehouse to be built in Tichborne-court, Holborn. Mr. Robert J. Worley, architect. Quantities by Mr. R. C. Gleed:—

Hyde	£1,420	14	2
Smith	1,379	0	0
Lawrance	1,344	0	0

For twelve warehouses to be built in Leman-street, E. Mr. Robert J. Worley, architect. Quantities by Mr. R. C. Gleed:—

	Main estimate.			Terra-cotta and glazed brick facings.		
Rider & Son	£15,918	0	0	£983	0	0
Downs	15,737	0	0	910	0	0
Hall, Beddall, & Co.	15,610	0	0	230	0	0
Lawrance	14,989	0	0	160	0	0

For additions to parish church, Maryculter of Hall, and apse for organ and choir. Messrs. Ellis & Wilson, Aberdeen, architects:—

Barber & King, Aberdeen (mason work).
James Troup, Maryculter (carpenter's work).
Wm. Milne, Aberdeen (slater's work).
Simpson & Rae, Aberdeen (plasterer's work).
Ed. Donald, Aberdeen (painter and glazier's work).

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W. F. Mason, Longsight, Manchester.

Accepted for two piles of Jennison's patent smokeless baking ovens, for Mr. Wm. Richards, Swansea:—
W. F. Mason, Longsight, Manchester.

For partly rebuilding and alterations to the "Elephant and Castle," Great Peter-street, Westminster, for Mr. W. Butcher. Mr. W. T. Farthing, architect:—
R. & H. Pickersgill (accepted) £1,148 0 0

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The Builder.

VOL. XLIII. No. 2064. SATURDAY, AUGUST 26, 1882.

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*Measurement and Design.**

IF we pass from buildings at large to details, to inquire how far mensuration comes into design in these matters, we have to divide design for this purpose into two groups,—that which consists in the moulding or modelling of surfaces, apart from carving, and that which consists in the production of surface ornament either by carving, drawing, or painting. The essential distinction between these two classes of ornamental detail is that the first is sectional design, the second design on a plane superficies. It is true that the mouldings, the flutings, and the other means of diversification of surfaces which come under the same head, and the object of which is to produce play of light and shade, and to emphasise lines of horizontal or vertical structure, are, when complete, appreciated by the eye as parts of a superficies; but they are designed in section, and thus a peculiar element comes into the designer's work,—the consideration of the actual effect when executed of profiles which are only seen as profiles when in the course of designing them, and when executed are never seen from that point of view, but only as surfaces presenting certain modifications of light and shade, from which the profiles can, by a practised eye, be approximately inferred, but which are sometimes very deceptive in this way, and convey impressions to the eye considerably at variance with their actual forms.

There is thus a curious discrepancy, in this class of work, between the manner in which it is looked at when in process of being designed, and that in which it is regarded when complete; and it is only probable in such a case that profiles would be often drawn to please the eye or the judgment when regarded as profiles, which would be no more effective in execution than a profile which might look much less symmetrical and satisfactory to the eye in a sectional drawing. The exception to this is when the moulding is in such a position and of such design that its entire profile can be seen as a profile when *in situ*, as in the case of the ovolo moulding of a Classic capital. Every moulding cannot be discerned in profile even in such a position as this; the typical style of moulding of an Early English capital, for instance, does not show its whole profile; the deep undercuttings which form the shadows are lost to the eye, and only appear as intervals of shadow; the profile at this part might be almost any shape, provided it recedes sufficiently from the face to produce the desired depth of shadow; and, as a matter of fact, these hollow portions of Gothic mouldings, which were often assumed by draughtsmen to be portions of circles until the cymagraph was applied to them, are very irregularly drawn, and mostly present no systematic or normal curve. It is needless to add that during the fervour of revived Mediævalism, this fact was no sooner discovered than it was set down as one of the peculiar beauties of Gothic moulding, and all circles and regular curves were voted vulgar in comparison. No doubt, had it been discovered that all the curves in Mediæval mouldings were truly struck from centres, it would equally have been asserted that this was the one true method, and the precision and exactitude of the masons of the Middle Ages would have been lauded as furnishing a model for us to follow. Fortunately, we are not all of us tied to precedent so much, and can judge the question on broader grounds.

When mouldings are so placed that their profile is distinctly seen, there can be little question that their most refined effect will be produced by delicate curves which follow a true mathematical gradation, as is the case, for instance, with the best examples of the ovolo of the Doric capital. In the case of mouldings on a small scale, it would be superfluous refinement to attempt this, as the eye can get as near to a true gradation as it is possible to estimate by the eye itself, which is all that is necessary. In profiles on a larger scale, such as that of the Doric capital just alluded to, the mathematical description of the curve is theoretically as necessary as in the case of a quadrant of a circle on the same scale: we want to have the curve perfect, and on a large scale the unaided hand is not sufficient, though it may approach nearer to perfection in drawing a long parabolic curve than in drawing a circle. There are two or three reasons for this; less change in the position of the hand is necessary for such long curves than for a quadrant or more of a circle; and in segments of the parabola, hyperbola, or ellipse, as used for the outer profile of a moulding, there is no centre point, as there is in the quadrant of a circle, on either side of which the curve must be exactly equal. Perhaps it may be added that the ellipse and the other related conic curves approach more nearly in their outline to the prevalent outlines in natural bodies, and especially of the human figure; and there may probably be some connexion between the love of and study of the nude figure by the Greeks in sculpture, and their preference for elliptical rather than circular curves in the mouldings of their architecture. Nevertheless, when the profile is on a tolerably large scale, the mathematical delineation of it by means of instruments is a further assistance towards securing that very delicate refinement and gradation of curve which is the peculiar beauty of the conic section curves, and in this respect we may say that measurement (taking that word in its broadest sense as the adoption of any means of geometrically exact delineation) may be an assistance to and even an important part of design. And as far as this applies to profile curves, it may also apply to those curves which, though not seen in profile in execution, are seen in nearly full light, and do not recede so much as to lose the requisite light to define their modelling. Take the flutings of a column, for instance; it may be worth while to profile these, when making the template, as true elliptical sections, for a more delicate gradation of light and shadow may be ensured by this means than can be attained either by segments of circles or by hand-drawn curves, and it is for the sake of shadow-gradation chiefly that mouldings are introduced at all into architecture, or at least it is by shadow-gradation that they produce their characteristic expression.

When once these more delicate curves are introduced into the details of a building, they seem to have a claim to be carried out throughout it. The mere circle, at least in convex mouldings, can hardly be intermingled with elliptical mouldings; it is too strong for its company; and the hand-drawn profiles which may accompany elliptic mouldings should follow their character, and partake of their refinement and delicacy of curve. This is the case with the best Greek mouldings; the refinements of compound curvature are carried out throughout them, and they left it to the Romans to be content with large and mechanically-designed circular contours. For this reason it has been very truly said (by Owen Jones) that though on a first glance at the buildings *en masse* there might not seem so much difference between a Greek temple and its Roman copy, especially as there is often a great scale about the latter which adds to its effect, a few mouldings taken from each would suffice to show that the Greeks were a people of far higher refinement in perception and execution alike. In the Mediæval mouldings we have something which is of a higher type than Roman detail; but they are so by virtue of their boldness, effectiveness, and the perception which they show as to the best way of handling the material used. They are, however, the least scientifically drawn of all that we have been mentioning. It is true that the refinement of the Greek profiles would have been thrown away in coarse stone, or at least could not have lasted long; but the Gothic mouldings might have been more truly and scientifically profiled than they usually are, without being any less effective in result, and so far their record is against them, and leads

* See p. 230, *ante*.

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to the conclusion that their merits have been a little exaggerated. They show greater variety, however, than those of any school of Classic architecture.

An intermediate class of ornament between mouldings and free ornamental design is that which consists in repetition of some very small and simple unit, or of a simple geometrical form, such as a square panel. In this case measurement is the very essence of the design, and must be carried out with minute precision. The taste for Japanese whims and irregularities, probably, has led some persons to imagine that there is a kind of charm in having ornament of this description looking as if it had been intended to be regular, but had been carelessly carried out. We have even seen it asserted that in Greek repetition ornaments, such as the bead and reel, the carver made no attempt at precise verisimilitude in each repetition, but was content to leave slight differences, and that the design gained in effect by these irregularities. This we take to be pure nonsense. The effect of the ornament consists in precise and regular repetition, and there is every appearance, in executed antique examples of this kind of ornament, of the intention to make each member as uniform and mechanically correct as possible; and rightly so. When an ornament is used obviously as a repeating ornament, its repetition should appear perfect and complete. Whether it is a very worthy employment for a man to be engaged in cutting so many hundred repetitions of the same form is another thing; but repetition is repetition, an effect *per se*, and should be carried out fully or avoided altogether.

When we come to the domain of decorative design properly so called, we find, among work which can be included in that category, almost every imaginable degree from purely geometrical to purely naturalistic work. On the geometric side we have Saracenic ornament, which, although it shows considerable beauty of free-hand work in small details, is in its main lines and motives almost entirely the outcome of "measurement." It is ornamental effect resulting from geometrical puzzles, and though it must be admitted that its general effect is admirable, there is really much more of ingenuity and contrivance about it than of pure taste or invention. It looks exceedingly rich and intricate, but its intellectual value has certainly been over-rated. It is a proof of the usefulness that geometry may have in producing ornament; an ornament which, when the cue is once given, can be enriched to almost any degree by merely a little modification and multiplication of the subordinate details. The case is more complex when we come to consider ornament which is not so confessedly based on geometry. Owen Jones, indeed, contended that *all* ornament is based on geometrical spacing and figures; but when he wrote Japan had not been discovered. The question whether all ornament is or should be so geometrically based or not is the very one we are examining here. How far is "measurement" the necessary or proper basis of decorative design?

On the whole, the principal of equal spacing and repetition must be held to underlie most surface ornament that has existed. The very simplest and what may be called the embryo idea of ornament is that formed by the repetition of some form, however simple, on the opposite side of a centre line. Forms which, when first sketched, of themselves hardly present much appearance of what we usually call ornament, seem to assume this sometimes in a degree surprisingly disproportionate to their first promise, when doubled so as to form two halves of a symmetrical whole. The kaleidoscope is a sufficient illustration of this; and the reason for it is that the symmetrical repetition suggests the idea of "design," in the signification of thought and deliberate intent, applied by the designer in arranging his materials. This idea of deliberate and considered arrangement is carried further when we find a design arranged so as to repeat itself over a large surface in regular spacing, and it is this element which Owen Jones thought must be always present in ornament. There is no doubt that it does characterise most of the surface ornament existing in the world, and that by this means of repetition a very good decorative effect may be produced with very simple materials; and it is equally certain that purely naturalistic forms imitated, without symmetrical arrangement or repetition of any kind, are not ornament, and for this reason, that ornament must include the application of human thought and contrivance,—what we signify more briefly by the appropriate word "design." Mere imitation of nature, however good, is not this, has not this quality of human invention. It is only more or less good imitation. The vases illustrated in last week's *Builder* (page 249, *ante*, "Modern English Pottery") may serve to illustrate this. The first Doulton ware specimen is ornamented with sprigs which are partially naturalistic, at all events not symmetrical, but they are symmetrically arranged in relation to the general division into parts of the whole vase. The next one, "Doulton's silicon ware," has for the elements of its ornament a few very simple forms, but they are arranged symmetrically on a definite plan; "measurement" pervades in every detail, and here, again, as in the Saracenic patterns, measurement produces ornament and the appearance of design. The elements of the ornament are but four or five very small isolated forms, which, if merely figured on the surface without arrangement, or drawn on paper, no one would care about in the least; but these, symmetrically spaced and repeated, form ornament, and withal very pleasing ornament. On the other hand, the jar figured at the bottom of the page, by Brown-Westhead, Moore, & Co., is wreathed with a perfectly naturalistic raised modelling of wreaths of flowers and birds: very pretty work, but not ornament; it is sculpture, it has no relation to its position or to the object on which it is placed, and no arrangement showing design. It is pictorial art, a higher thing in itself, possibly, than ornament, but also a different thing, and not to be confounded with ornament or applied in the same manner. It is imitative work, not the application of the mind of the designer towards producing an effect of his own. That is what ornament is: it is not the painting of an imitative repetition from nature, but the invention of the ornamentist acting on hints from nature. And hence the mere adoption of a flower or spray in naturalistic form, and its regular repetition over a space, as we see so often in wall-papers, hardly deserves the name of ornament. There is no thought in it: it is merely the mechanical repetition of a natural form. To raise it to the quality of design, properly so called, it should be treated by the designer in such a manner as to make it his own, and to make it appear as if it were intended and calculated for symmetrical repetition.

We wish, however, to suggest the question whether symmetrical spacing and repetition is always, according to the usual dictum, necessarily an element of ornamental design. It enables us to make ornament, so far as it goes, and satisfactory ornament, out of very simple elements. And when used, it should be frankly used, and allowed to show itself as repetition, and not elude observation. There is rather a fashion at present for semi-naturalistic wall-papers and wall-diapers, which are in reality pieces of repetition in regular spacing, but which are adroitly contrived so as to "hide their joinings," as far as possible, and appear at first glance like one continued floral pattern meandering all over the wall. This is all very well at first glance, but when the eye notices the same spray, the same half-open bud or crumpled leaf, apparently with so much of the freedom of nature, repeating itself conscientiously every 2 ft. or 3 ft. apart, there is a feeling of incongruity in finding a pattern, apparently so natural, to be in reality so artificial. If there is repetition, let the repetition be marked, not evaded. But we have one final and possibly heretical suggestion to make, in the form of a question, whether this same resource of repetition so constant in surface ornament, may not be after all a concession to circumstances rather than a necessary element. That is to say, it is well to have a small bit of really good design and repeat it over a whole surface. Would it not, after all, be still better to have a good design which, without repetition, will spread itself over and fill the whole surface? There seems to be a tacit feeling in favour of this idea implied in that very attempt to give that effect to recent wall-paper designs to which we have just referred. Practical considerations would make it impossible, certainly, to carry out design on this large scale often. It would require much more thought on the part of the designer, in the first place. It is one thing to fill four square feet of surface with ornament; another thing to fill 400: and it would, of course, be enormously more expensive in execution: but it would be a much higher act of decorative creation to make, as it were, one growth of the whole ornamental design. In such a case the element of measurement would come in in the details, which should be clean and symmetrical, no attempts at imitating the actual growth of natural foliage, but a creation of the designer's, founded on natural types or principles, and treated with the precision of the draughtsman, just as in the case of Greek honeysuckle detail. But, instead of merely repeating such detail as this in regular succession, the designer would give it a growth of its own and make it spread, freely and without repetition, over the whole space to be covered, and thus at last escape from the trammels of mensuration. It is but seldom that such an attempt could be made, but it would be worth trying when circumstances admitted of it.

ST. ANNE'S SCHOOLS COMPETITION.

The St. Anne's Society having procured a site at Redhill for the erection of new schools, and offered premiums of 250*l*., 150*l*. and 100*l*., for the three best designs for such schools, the plans sent in competition have been on view during part of this week at the present schools at Streatham-hill.

It may not be out of place to say a word about the society and the object for which the proposed buildings are to be erected, about which, probably, many of our readers know nothing. It was founded in the first year of the reign of the queen after whom it is named, when some gentlemen formed themselves into a society for clothing and educating twelve boys, the sons of parents reduced to a necessitous condition; and a school-house was provided in the parish of St. Anne and St. Agnes, Aldersgate. In 1790 a girls' school was added to this establishment, the number being limited at first to thirteen girls. The number increased as the funds of the society increased, and in 1820 thirty boys and thirty-two girls were under instruction. These numbers have not been increased since, as the town school afforded no further accommodation; but in 1795 a country school or asylum was established in connexion with the original charity, and located first at Lavenham, a place well known to architects for its magnificent church. Among those concerned in founding the country school were Wilberforce and Whitbread. This new establishment at first accommodated twenty boys, who were selected from the town school, to which it was, therefore, a kind of "chapel-of-ease," so to speak; but before long the principle of admission was changed, and the country asylum was rendered independent of the town school, and received inmates who were eligible according to the conditions from any part of the country. After a few years, the asylum was removed to Peckham, in Surrey, where it remained till 1825, when the present building at Streatham-hill was in part constructed for the accommodation of a matron, a master, a mistress, 100 boys, and 50 girls. Since then the numbers of those desiring and having claim to admission increased very largely, and in 1855 the building was considerably added to and brought to its present state by the addition of new dormitories, lavatories, &c., at a cost of 4,000*l*., and the school now contains 200 boys and 147 girls, and the necessity for enlargement has again made itself felt. The committee are now proposing to rebuild entirely, on a site further from London, and hence the present competition.

The instructions to competing architects required a building with accommodation for the number of boys and girls named above, at a cost of not more than 35,000*l*., including everything except furniture.

From a considerable number of plans submitted in competition, the committee have selected, for the first premium, that with the motto "By Study," by Messrs. Crickmay & Son; the second premium is awarded to that marked "Per Se," by Mr. Matthew Wyatt and Mr. T. S. Archer; and the third to that marked "Economy," which is by Mr. Rovedino.

The problem is not a very difficult one in planning: it is the provision of a double school, for boys and girls, connected with certain portions, viz., the dining-hall and the administration department, which are equally related to both schools. The placing of these in the centre and the schools at opposite wings seems, therefore, the almost inevitable arrangement. As the schools for boys and for girls are not

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required to accommodate the same numbers, and the rooms required are not precisely the same either, even apart from numbers, the place does not naturally suggest a symmetrical arrangement on either side of the centre, and this fact, as well as considerations relating to architectural expression, seem to point naturally to a distinct treatment of the boys' and the girls' side. The authors of the first premiated designs, however, do not seem to have regarded it in this way, as they have treated the building as a block with almost entirely symmetrical wings on either side of a centre. The style selected is "Queen Anne," which, considering the history of the institution, is perhaps the most suitable æsthetically, and not unsuitable practically. The building is very plain; there is a short tower over the central entrance, which appears (according to one of the sections) to be utilised for an extract ventilation flue from the dormitories generally; on either side of this extends the main longitudinal block, containing administrative and residential rooms and a long corridor, and the working-rooms for boys and girls respectively form a cross block at either end of the long one. Behind the centre of the longitudinal block are kitchen-offices, pantries, &c., and behind these, again, the large dining-hall, with an open-timber roof, and reached by short passages out of the principal corridor, which passages run outside of the pantries, &c., on either side, so that these rooms are only, apparently, lighted by borrowed light from the passages, which does not look very well. The boys' block contains schoolrooms for senior and junior boys, capable of being divided into class-rooms; the girls' block, schoolroom, work-room, and music-room, the latter being divided into small rooms, with, we hope, some special means in the division walls for deadening sound,—and with a common passage running before them. It is with regret that we see a music-room provided for the girls only, and none for the boys, so that the committee are still under the common delusion that music is essentially a female "accomplishment," and that no special opportunities for learning it need be afforded to boys,—in which idea they are decidedly behind the age. The assistant master's and mistress's sitting-rooms are agreeably arranged in bay-windowed rooms, projecting from the principal corridor in the longitudinal block; but the latrines, which also open out of this corridor, are not so well placed, and require more decisive isolation and ventilation. There appears to have been consideration for the systematic ventilation of the dormitories, which occupy most of the first and second floors. The infirmary, a separate building, is not very well planned; it is in a cross form, one wing for kitchen, &c., one for ordinary illnesses, another for infectious diseases, the fourth contains the day-room: in this block the treatment of the latrines is more satisfactory, but the meeting of the four departments at the centre of a cross plan is by no means in keeping with the best sanitary principles of planning such a building. The chapel is placed apart from the main building, and in no sort of relation to it, and is in Gothic style. This is architecturally a mistake. There is no reason whatever for having the chapel in different style to that of the rest of the building. It requires a special design and treatment, but not a special style. The authors, by the way, exhibit two sets of plans, and it is the alternative set that has been accepted; the two differ, however, in no material points, but only in the smaller area of some of the rooms in the alternative one, the main object of which is a certain degree of economy. We question whether the committee have done wisely in preferring the smaller plan; the saving will not be much, and space is a great matter.

The authors of "Per Se" have adopted the idea, which we prefer, of treating the boys' and girls' sides differently; the dining-hall and the administrative department come in the centre, but symmetry is nearly discarded otherwise, and the different portions of the plan are arranged rather with regard to their relation to one another and to the convenient fitting together of the various buildings. Covered playgrounds are added outside the school-room departments, and a swimming-bath behind the dining-hall: all which are desirable adjuncts. The plan, though not to appearance quite so simple as the first-named one, is as good a one in the main, and in some details, such as the placing and arrangement of the latrines, it is better; the plan of the separate infirmary is much better than in the first premiated one. The style is more ornate, embodying what is now sometimes called "Free Classic," consisting in a reminiscence of Jacobean, with other touches of more modern type. We do not admire it very much however, and the double towers and cupolas, one on either side of the centre entrance, look rather pretentious and useless. The chapel is in the same style as the rest of the building, and is made to group with it. On the whole, this seems to us the best plan of the set, but its architectural treatment is more costly and not very refined, and, on the whole, less suited to the class of building than that of "By Study."

In the case of the third premiated design, "Economy," we confess we can hardly see the claim it has to be put in the running with the two others at all, as it is much inferior to them, though it may be admitted that if the third premium was bound to be given there is, perhaps, no other set worth consideration to which there is not some more decided objection than could be urged against this one. The "economy" seems to consist in reducing the rooms mostly to very narrow proportions, in fact, cutting down the area of floor as far as possible, in a manner which necessitates very long blocks and a considerable spreading out of the building over the ground, which would be by no means convenient in the general working of the school; and even if the schoolrooms and playgrounds have sufficient area, it is in a bad form, long and narrow; and the spreading out of the administrative department along a set of small rooms the whole length of the very long main corridor is not convenient or desirable. The chapel, which ought to be equally connected with both sides of the school, is placed rather as if it belonged to the girls' department. The plan altogether wants concentration.

The choice unquestionably lies between "By Study" and "Per Se," and so far there is nothing to complain of in the decision. Had the authors of the last-named shown more refinement and simplicity in their architectural treatment, we should have had little hesitation in pronouncing theirs to be the most to be recommended. As it is, the merits of the two are rather evenly balanced. Among the others, "Comme il faut" deserves credit for hard work bestowed on a very elaborate set of drawings, unfortunately of doubtful merit in regard either to plan or design; "Rath-haus" is a pretty and architecturally clever design, with its plan very compact, but the arrangement of the buildings around quadrangles, and very small ones too, is a fatal objection. "Standard" sends some good drawing, including a pretty perspective view, but the plan is rambling and not practical. There are several other agreeable drawings, but nothing in planning that is not open to a good deal of criticism, and the committee seem to have been well advised in the award of the premiums, and to have made the choice on practical grounds. Mr. Whichcord was appointed the professional assessor, and among the conditions of the competition it was laid down that until the decision was made public no competitor should send any drawings, photographs, or printed statements to any member of the Committee, under pain of disqualification,—a very wholesome regulation. The Committee did not bind themselves to employ the author of the first premium design necessarily, but to employ one of the three, on his giving satisfactory evidence of his experience, and producing a builder's estimate not exceeding his own by more than 10 per cent. There seems to have been every effort to single out the best work and to deal perfectly fairly with the competitors, which is more than can be said of all architectural competitions.

The "Novelty" Theatre. — The new theatre which has been for some time in course of erection in Great Queen-street, Lincoln's Inn Fields (nearly opposite the Freemasons' Tavern), is approaching completion, and will, it is expected, be opened about the middle of October. It is the property of a limited company, of which Mr. James Albery, the dramatist, is one of the directors. The theatre, which is about the size of the "Vaudeville," in the Strand, will be lighted by electricity. It has been erected from the designs of Mr. Thomas Verity, architect, the contractors being Messrs. Kirk & Randall, of Woolwich.

DR. SCHLIEMANN'S NEW EXCAVATIONS IN THE TROAS.

At the thirteenth annual congress of the German Anthropologists, which has just been held at Frankfort-on-the-Main, Dr. Schliemann read an important paper upon his latest excavations on the site of ancient Troy. In the course of his remarks the learned gentleman said:—Three years ago I was under the belief that I had for ever finished the excavations at Troy, and I thought I had proved that the small settlement, the substructure of whose houses I had found at an average depth of 8 mètres underneath the remains of four later cities, lying one above another, must necessarily be the Troy which had been rendered immortal by Homer. Subsequently, however, doubts arose in my mind, and it soon became impossible for me to believe that the poet could have represented a diminutive settlement, which was capable at the utmost of accommodating three thousand inhabitants, as a great and powerful city, with an acropolis capable, for ten long years, of defying the united army of all Greece, and only conquered at last by cunning. Accordingly I determined to make an additional five months' search, in order finally to settle this very important question. For this purpose I secured the services of two eminent architects. One of these was Herr Wilhelm Dorpfeld, of Berlin, who, for a period of four years, had conducted the technical portion of the German excavations at Olympia. The other was Herr Joseph Hofler, of Vienna. They had both received premiums from the Government in order to pay visits for the purpose of study in Italy.

Through the kind interoession of the German Chancellor, I received a new and more liberal firman from the Sultan, permitting me to make archæological researches anywhere in the Troas. Armed with this authority, I commenced the excavations afresh in Hissarlik, on the 1st of March this year. I employed 150 men on the work, and that remained the number of my labourers throughout up to the finish. I further received the assistance of a considerable number of vehicles, drawn by horses and oxen, to carry away the rubbish. As the country where the work was carried on was most insecure, I received, during the whole period of the excavations, the protection of eleven gendarmes, whose pay amounted to 30*l.* a month. Fortunately, I had had my old wooden cottage looked after since the spring of 1879, and I now found it, as well as my tools and implements, still in good condition. With the exception of the three first days, we had, without cessation throughout all March and April, a cold north wind, which every day became a regular storm, and drove the dust into everybody's eyes, and was almost the death of us through the cold.

One of our first labours was to lay bare all the foundations of Greek and Roman buildings in the part of Hissarlik till then unexplored. We also had to collect the sculptured blocks belonging to these edifices as well as other sculptured remains belonging to buildings unknown or imperfectly identified. Among the latter a small Doric temple deserves particular notice, as it appears to be identical with that small and inconsiderable shrine of Pallas Athene which, according to Strabo (viii., 593), was seen here by Alexander the Great. The architects are, however, of opinion that the remains of the sculptured blocks belonging to this building are not archaic enough to have belonged to the temple of the goddess just mentioned, which, according to Herodotus (vii., 43), was visited by Xerxes. Of the later buildings, the oldest is a large Doric temple of marble. It is to this temple that the splendid metope belongs which I discovered here ten years ago, and which represents Phœbus Apollo with the quadriga of the sun, and which is now deposited with the Trojan Collection in Berlin. This temple is without doubt identical with that which Strabo (viii., 593) tells us was built here by Lysimachos. As it is by far the largest of all the temples, I entirely agree with the architects that it must necessarily be the shrine of Pallas Athene, the protective goddess of Ilium. I may here mention that, according to the evidence given by the architects, I was quite mistaken in supposing that I had destroyed the temple of Pallas Athene nine years ago. It was only the substructure of a Roman Stoa, which I was compelled to destroy in order to reach the older remains beneath it. Among the buildings which can be identified, I will

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further mention a marble Doric portico of the Roman period, of which some steps still remained *in situ*. Two smaller buildings in the Doric style are also worth noting, as well as a very large beautiful marble gate of the Acropolis, in which both the Ionic and Corinthian orders were represented. Sculptured blocks belonging to all these structures are to be seen in abundance in the neighbouring churchyards of Halil Kisi and Kum Kisi, where they have been used as gravestones.

Far larger than any of these edifices is the huge theatre I have excavated. It is hewn out of the solid rock immediately to the east of the Acropolis. It overlooks the Hellespont, and was capable of accommodating upwards of 6,000 spectators. On the stage side, the substructures of which is well preserved, I found countless fragments of marble pillars of the Corinthian, Doric, and Ionic orders, as well as immense masses of chips and fragments of marble statues, and a lime-kiln, in which all the statues appear to have been burnt to make lime of. A head and numerous hands and feet of statues; a relief-medallion on which is represented the she-wolf suckling Remus and Romulus; and a fountain adorned, with a Gorgon head, are among the remaining evidences of the former splendour of this theatre. It belongs to the Roman period, and was probably constructed by Sylla or Julius Cæsar.

In the countless shafts and pits I sank in the Lower City to the east, south, and west of the Acropolis, I found the substructures of numerous large buildings belonging to the Macedonian or Roman period. One, which was covered with beautiful marble tablets and adorned with a long row of granite pillars, was probably the Forum. In many of the houses of Novum Ilium we uncovered mosaic floors or pavements, all of which are unfortunately more or less destroyed. In all the pits and shafts to the south and west outside Hissarlik, I found beneath the Hellenic and Roman buildings, large quantities of broken earthenware dating from the oldest prehistorical settlements. In one shaft immediately to the south of the Acropolis there was found a well-preserved piece of relief-sculpture belonging to the Roman period, and containing a representation of Hercules as well as a headless figure.

The most remarkable discoveries I made, were in the three lowest pre-historic settlements, on the hill of the Acropolis. My two architects proved beyond any doubt that the first settlers here only erected one or two large buildings, which were enclosed by a high wall, 2 mètres in thickness, and consisting of small stones united with mud or clay. A considerable portion of the ruins of this are to be seen in my large northern pit. The length of this first settlement did not exceed 46 mètres, and its breadth cannot have been more considerable. The architecture of the buildings of this first settlement is still a complete mystery to my architects, for at distances of 3½ mètres, 5½ mètres, and 6 mètres, we have five parallel inner walls, about four-fifths of a mètre in thickness, which have no cross walls, and therefore form long halls. However, we were only able to lay them open to the width of my long northern pit, or to about the length of 30 mètres. The walls consist of small stones, mixed with earth, and in several parts their ornamentation is still preserved.

We may assume, with the greatest probability, that this first settlement is one of the lower cities, and that it extended in a southerly and westerly direction. In fact, the earthenware articles, found there in the lowest layer in my pits and shafts are identical with those of the first settlement of the Acropolis, and leave hardly a doubt about the position of the place. This first settlement appears to have stood here for many centuries, as the rubbish there had gradually collected to a height of 2½ mètres. From this first city I have brought away an axe made of nephrite, and two earthenware articles, one of which, at any rate, is ornamented with an owl's head.

My architects have also demonstrated that Herr Burnouf and I had not correctly distinguished and kept separate the ruins of the two following settlements; that is, the second and third cities. We had quite correctly regarded the walls, which are three mètres in depth, and consisted of large blocks as part of the foundations of the second city, but we had not classified with the latter the layer of burnt ruins lying immediately above, and which really belongs to it, but had reckoned these ruins as part of the third city, with which they had nothing to do. What had led us astray was the immense mass of rubbish, consisting of burnt bricks, that lay upon the ruins of the second city, which had been destroyed by some tremendous catastrophe. This rubbish quite had the appearance of having originated from houses that had been destroyed by some terrible conflagration. In truth, however, it is nothing more than the ruins of brick walls which had been first built up of lumps of unburnt clay, and had afterwards, for the sake of greater solidity, been burnt by great fires simultaneously lighted on both sides. The city that had been burnt down, therefore, was not the third, but the second. The layer of rubbish belonging to this, however, as the third city was erected immediately upon it, is but trifling, often being only from one-sixth to one-fifth of a mètre in depth. That the walls above mentioned were first erected of clay, and that this was afterwards burnt, is confirmed partly by the circumstance that the clay mortar between the bricks is burnt precisely in the same manner as the bricks themselves, and partly by the fact that the upper parts of the walls are the least burnt, —often, indeed, hardly at all so.

Besides the three temples, although I have unearthed almost the entire Acropolis within its walls, I have discovered only three, or at most four, buildings of large dimensions. Owing to the large number of these rooms and their ground-plan, we conclude that these were dwelling-houses. How many houses there were it was, however, impossible precisely to determine without first making out a plan of the entire Acropolis. This, however, unfortunately, the War Minister at Constantinople most strictly forbade us to prepare. He feared we had come only to get plans of the fortress of Kum Kaleh, distant about four or five miles from Hissarlik, and quite invisible from the latter place, and that we were only using the excavations at Troy as a pretext for effecting criminal purposes. He accordingly caused the military guard constantly to keep watch over us, and their orders were to prevent us from taking measurements of the house walls at Troy by means of tape or cord, and even from making drawings within the excavations themselves. The Turkish Commissioner, in fact, had been charged to take my architects prisoners to Constantinople if they attempted clandestinely to take the most trivial drawing or measurement. I hope that the German Chancellor will be able to find means of removing these petty hindrances to the advance of antiquarian science, for the *chargé d'affaires* at Constantinople wrote to inform me that he was unable to obtain any concessions in this direction.

All the above-mentioned buildings on the hill of Hissarlik were surrounded by a fortified wall, composed of large and small stones mixed with earth. On the south and south-west side this wall is preserved. It served as the foundation of an extensive brick wall, which was probably provided with a number of towers. This foundation is laid under an angle of 60°. Its perpendicular height is 7½ mètres, while the oblique surface measures 9 mètres. On the northern side the foundation consists of very large blocks. As this side overlooks the plain, the great wall, the upper part of which was built of brick, doubtless presented an imposing aspect, and probably led the Trojans to attribute it to Poseidon and Apollo.

The second settlement upon the hill formed only the Acropolis, while to the south-east, south, and south-west, lay the adjoining lower city. The existence of this lower city is first proved by the wall which runs in a south-easterly direction, and which, unlike the oblique fortified wall of the Acropolis, stood quite perpendicular. It consisted of large unhewn blocks, with small stones in the interstices. The existence of the lower city is also confirmed by the circumstance that, in the lowest layers on the plateau below the castle hill, a great mass of pre-historic terra-cottas have been found. In form and material the latter are identical with those of the second settlement upon Hissarlik. Another fact telling in the same direction is found in the arrangements of the south-western gate. In the second settlement there is but one simple appliance for closing it, while the settlers belonging to the third city had added two more, because it then no longer opened into the lower city, but directly into the open country, as there was no lower city during the third settlement. A further proof of the existence of a lower city is the presence of three gates. We had already found on the south-east side a gate of the third city, in the middle of which was the sacrificial altar depicted in my "Ilios," plate No. 6. One mètre and a half below this we found the third great gate of the second settlement, which, however, appears only to have been erected after the second gate had been burnt down and covered with rubbish. A much more weighty argument, however, in favour of the existence of a lower city is to be found in the number and arrangement of the buildings situate within the Acropolis.

Since, however, none of the later cities, down to the time of the erection of Novum Ilium, had a lower town, the ruins of that belonging to the second settlement stood deserted for many centuries. The brick walls were broken up, and the bricks were applied for new buildings upon Hissarlik. I now believe the tradition mentioned by Strabo (xiii. 599), according to which Archæanax, of Mitylene, built the walls of Sigeion with the stones of Troy, for by these only the stones of the lower town of the second settlement and probably the stones of the walls, can be meant. In spite, therefore, of my extensive excavations in the lower town of Novum Ilium, it is only natural that I found no stones or bricks belonging to the lower town of the second settlement, although in several spots I found the natural rock levelled and prepared upon which that wall must have stood. In the upper town I found large masses of slate tablets which at one time served to cover the floors here, as I found many of them still *in situ*. But that all the clayey floors were covered with such tablets is not probable, for many of them in the great catastrophe were melted and received on the surface a glass-like appearance owing to the silica contained in the clay. In my opinion, this could not have happened if the floors had been covered with slate tablets.

Of gold, we found this time only a small diadem and an ear-ring of the usual Trojan shape, and in addition an ornamental sceptre-top. Of silver articles, we found four or five pins and numerous ear-rings, which through chlorine had been welded together. I also discovered at the spot marked "r" in plan I. of my "Ilios" a small deposit of bronze articles, consisting of two square nails, respectively ·09 mètre and ·18 mètre in length; six well-preserved armlets, two of which are of threefold form; three small battle-axes, of from ·105 to ·120 mètre in length, two of which have a hole pierced through them at one end; also another battle-axe, ·230 mètre in length. All these axes are of the usual Trojan form. I further found three small, well-preserved knives, a dagger, ·22 mètre long, of which the handle is square, and which was, doubtless, fixed either in wood or bone. This dagger in the great fire had been bent round. Our find also includes a lance-head and an exceedingly singular cast ring, of about the size of our table-napkin rings. It is ·045 mètre broad, its diameter being ·068 mètre. It is marked into five divisions, each with a cross. By far the most important object found, however, was a bronze idol, of the most primitive form, ornamented with an owl's head. One hand rests upon the breast,—it appears to be a female idol,—the other arm is broken off. Behind, it has a support seeming, probably, simply to maintain the idol in an upright position. Its dimensions are ·155 mètre in height, the weight being 440 grammes. I consider it probable that this bronze figure is a copy or imitation of the celebrated Palladium, which was of wood. It is fortunately broken into three pieces, and it is to this circumstance that on dividing our find with the Turkish Government I obtained this portion of it, as the three pieces were covered with dust, and by an inexperienced eye could not be made out. Terra-cotta quarters we found in considerable numbers, twenty-six of them in one heap, in front of Temple A. We also found many beautifully polished axes of diorite, besides five of beautiful nephrite; further, numerous hand-millstones of trachyte, mortars and pestles, countless corn-crushers of granite, porphyry, and so on. There were also numerous battering-balls of hæmatite, one of them weighed 1,130 grammes, another found in the third, 520 grammes. In ivory, I found a remarkable article with five projecting half-spheres, like No. 983 in my "Ilios." We also found two knife-handles in the form of pigs or dogs, like No. 517 in the "Ilios." In earthenware I found various specimens of owl-urns and tripod vases, as in former excavations. Particular interest attaches to the excavations I carried on this year in four so-called tombs of

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Trojan heroes. For permission to explore the two at the foot of the promontory of Sigeum, respecting which tradition ascribes the larger to Achilles, and the smaller to Patroclus, 200*l.* sterling was demanded of me three years ago. I now received the same permission for 3*l.* sterling. I reached the rock at the depth of 6½ mètres. I there discovered a bronze arrow-head without barbs, in which there is still seen the tops of the little flanges used to fasten it to the shaft. I likewise found there an iron nail and a mass of fragments of earthenware made by hand, which was only slightly burnt, being thick and heavy, and of grey or black colour; they are similar to what are found in Hissarlik underneath the Macedonian walls, but their age is difficult to determine. Similar fragments of pottery are also found in the grave of Patroclus, which, therefore, appears to belong to the same epoch as that of Achilles. As in all tumuli previously explored by me, I failed to find any trace of bones, ashes, or carbonised remains in these two heroic tombs. The third excavation I carried out was in the tumulus on the opposite shore of the Hellespont, near the ruins of Eleus. The tradition of all antiquity ascribed this to the hero Protesilaos. It is now popularly called Kara Agateh Tepeh; that is, Black Fire Hill. Its diameter is 126 mètres, and it is now 10 mètres high, but as it is cultivated, it was probably once much higher. I was greatly astonished to find the surface of this mound covered with fragments of those glittering black terra-cotta dishes with long horizontal tubes, or those vases with double perpendicular pipes for hanging up. Such fragments are found in Hissarlik only in the ruins of the first settlement. What I was most astonished at was the fact that the fragments in question appeared quite new, although they probably had been for 4,000 years more or less exposed to the air; in fact, even the lime with which the indentations of the carving were filled was still preserved quite fresh. I at the same time collected several fragments of pottery like what is found in the second settlement at Hissarlik; I also obtained several stone hammers. In the middle of this remarkable tumulus I employed four labourers in sinking a shaft 3 mètres long and broad, when suddenly the military governor of the Dardanelles ordered the work to be discontinued. In two days I had sunk 2½ mètres, and obtained a rich collection of interesting stone tools and pottery. At 1½ metre deep I found in this tumulus a layer of bricks mixed with straw, and slightly burnt, similar to those found in the second and third cities at Hissarlik. After this I proceeded to explore the three tumuli above Tepeh, but unfortunately here, too, the work was stopped by the same authority before I could obtain any result.

DESIGNS FOR CROSSENS NEW CHURCH.

In answer to an invitation to compete for two premiums, some thirty-seven plans were sent. The problem to be solved was difficult. It was to provide 400 sittings for 2,400*l.* As might be expected, some excellent designs were sent, but which also plainly could not be erected for the meagre sum named. These were thrown out of the contest, but the struggle was still a close one. Eventually, the committee gave the first premium to Mr. J. W. Connon, of Leeds, for an Early English design; while the second premium was awarded to Mr. Ernest Johnson, of Southport, whose design showed a large west tower, having a gallery, and also seats in the basement. All the plans were then publicly exhibited in the Atkinson Art Gallery, where for four weeks they have been largely viewed by residents and visitors, the daily return averaging about 400.

Drinking Fountain in Lincoln's Inn-fields—On Monday morning a new fountain was unveiled in Lincoln's Inn-fields, under the auspices of the Metropolitan District Fountain and Cattle Trough Association, in memory of the late Mr. Philip Twells, formerly M.P. for the City of London. Several members of the family were present, and the ceremony was performed by Mrs. Twells, who, in a few appropriate words, declared the fountain open to the public. It is built of granite, and its cost is estimated at about 1,000*l.* The architect was Mr. R. Keirle.

THE LATE PROFESSOR JEVONS, AND THE COAL PANIC OF 1872-73.

Those of our readers who remember the coal panic of 1873, and the careful investigation, in the columns of the *Builder*, both of the subject of our coal supply, and of the report of the Commission appointed in 1866 "to inquire into the several matters relating to coal in the United Kingdom," will have heard with pain of the premature death, by drowning, in the forty-sixth year of his age, of Professor W. Stanley Jevons, whose application of the formula of arithmetic progression to the returns of the yield of our coal-fields raised the first alarm as to the limits of their possible capacity. To the statements of Mr. Jevons, we suppose there is little doubt, the appointment of the Royal Commission may be directly traced. That the subject was so treated by the report of the Commission as to impart to the public the panic which had evidently seized the Commissioners, was not the fault of Mr. Jevons. It is plain that the Commissioners were terrified by the steady march of the columns of figures cited by the Professor,—and that they so far lost their heads as to fail altogether to inquire whether any natural causes would be likely to come into operation to change the law of increment at any given time. As the matter stood, it was, in fact, one of those scientific conundrums that present such ridiculous, but perfectly logical, conclusions. Our readers may have seen a very accurate calculation of what advantages might have been secured to the posterity of Adam had that patriarch had the providence to lay up a single halfpenny, at compound interest, for their benefit. We forget the answer, and it is not worth while to lose time in hunting for it; but the extinction of the national debt would have been a mere fleabite in the prodigious result of interest upon interest for six or seven thousand years. Such things are very well as exercises, but have to be carefully dissociated from daily life. The existence of banks, and of the modern commercial system of investment, is, of course, the suppressed assumption which allows such an hypothesis to be put on its legs.

The alarm note struck by Mr. Jevons was, indeed, something very different from a scientific puzzle. In the year 1864 the yield of our collieries was 92·8 millions of tons of coal. In 1854, the first year in the returns published by the Board of Trade, it had been 64·6 tons. We may note in passing that the yield of 1855 was 61·4 millions of tons, or positively 3·2 millions less than that of the previous year. This fact alone might have convinced a careful observer that ten or eleven years,—in the course of which such a retrogression had occurred, was not enough to establish the inexorable rigidity of a law, such as that which was supposed to be threatening the extinction of our furnaces. In the eleven years from 1854 to 1864, then, the increase in the annual yield of coal had been 28·2 millions of tons, or 43 per cent. on the yield of the earlier year. We are not sure that these were the exact figures taken by Mr. Jevons, but they are those of the official returns for the years we have named. An increase of 43 per cent. in eleven years, is equal to an annual increment at the rate of a little more than 3½ per cent. (which gives 41 instead of 43), or to a duplication of the original figure in twenty years. In sixty years, therefore, the duplication occurs, as matter of tabulation, three times, so that by A.D. 1914 the 64·4 million tons of 1854 would amount to 515·2 millions of tons, by 1934 to 1030·4 millions of tons, and so on.

Now it might have been thought that a Royal Commission, consisting, or purporting to consist, of picked men, would have begun by saying to one another, "We are not met to verify a statement of progression, which is a mere matter of abstract arithmetic, but to inquire, on the broadest grounds, whether there is any cause for just alarm as to the exhaustion of our collieries. If men continue to abstract coal, sooner or later all the coal will be extracted. That is an axiom as certain as that all men must die, and in itself it is not much more practically alarming. Are there any steps that we can suggest to prevent the waste of coal?"

Instead of this, however, the Commissioners took the ugly figures to be,—not only indisputable as figures, but,—a practical guide to an anticipation of the future. And then,—no doubt with the best intentions,—finding that the end of coal drew near, upon paper, they tried to soothe the public mind by doubling the estimates of the capital on which the future had to draw,—on the money in the bank,—that is to say, on the quantity of the coal beneath the surface. At 4,000 ft. in depth the temperature of 122° Fahrenheit is the least that can be anticipated; and in coal-mines, where the increase of heat with depth is greater than in other strata, it probably is much more. Not only is this a more than tropical heat for the air,—in the *shade*, be it remembered,—but the heat of the soil is too great to be touched by the naked foot without pain, and rapid disablement; nor do we apprehend that boot soles would make any very great or permanent difference. However, the Commissioners trusted that, by and by, some means would be found for cooling the earth at this depth; and reported that "it might fairly be assumed that a depth of at least 4,000 ft. might be reached." And down to this prodigious depth, counting as "available coal" everything that looked black, they reported that there existed 90,000 (or to be exact, which in such a case is no doubt a virtue, 90,207) millions of tons of coal. Our own estimate at the time, if we remember aright, was that down to the limit of blood heat, which we take to be the hottest temperature at which human labour is available, we might estimate the coal beneath our fields at 61,000 millions of tons, of which, however, more than a third could only be extracted at prices rising to the limit of commercial impossibility.

It is not surprising that coal-owners, on the one hand, and coal-consumers on the other, should have thought that there was something irrefutable in the menace, to avoid the terror of which grave men, sitting in a snug chamber at Westminster, proposed to send miners into driftways of the temperature of from 92 degrees to 123 degrees Fahrenheit. The price of coal sprang up from the date of the report, and in 1873 the price in the Thames, which had fallen 1d. per ton in the year after Mr. Jevons first made the calculation thereon, sprang to 31s. 3d.; having been 19s. in 1866, 18s. 2d. in 1871, the year of the report; and 23s. 10d. in 1872. In other local markets, as at Cardiff, proportionate rises occurred. It is true that the year 1873 was one of generally inflated prices. But it is not so sure to what extent the general rise followed rather than preceded that of coal. Every one will remember that at the time the rise in the price of coal was put forward as an excuse for every possible augmentation of cost, and we are disposed to think that it was probably the main cause, and that a rise involving much distress, check to business, and national collapse, was traceable in the main to the work of the Duke of Argyll's Commission.

It should have been obvious to those gentlemen that, besides the question of heat, which they so gallantly disregarded, there were other elements which could not fail to come in to arrest the march of the tabular increment. Price, as we pointed out at the time, was one of them. And price did rise, as we said it would; and what was more, as prices rose efficiency of labour declined. In the year 1869 each miner, on an average, sent to bank 312 tons of coal; in the year 1874 each miner only sent 249 tons to the surface. With rise of price,—especially when connected with decrease of industry in the better-paid workmen,—it is obvious that foreign coal will come into the market. A cargo of coal, in spite of the proverb, was said to have been actually sent to Newcastle. Long before any practical difference between the value of our estimate and that of the Commissioners could come upon the carpet, it is clear that the importation of foreign coal would have become an element in the price of coal in England, and in the activity of our own mines.

Another consideration should have been no less conclusive as against the enormous annual yields on which, at rather distant dates, the exhaustion of our coal supply hinged. The 500,000,000 tons that were to be extracted, according to the tabulation, in A.D. 1914, would require the labour of 2,000,000 miners. By 1934 double that number would be requisite. But this demand would have left so few able-bodied men for the discharge of all other industrial occupations in the country, that the coal raised could not by any possibility have been consumed,—a balance that, in point of fact, would have been reached at a much earlier period, — but which the Commission never thought of striking.

Peace to the ashes of the Professor. We do not think that the coal panic was attributable to his calculations, except in so far as indirectly

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they frightened the Commission, and so frightened the country. But there is a great comfort to those of us whose mathematical acquirements are of an humble order, to those of us who hate long sums, and to those of us who, as practical men, are always disposed to think that something has been overlooked, when frightful calculations of statists and political economists are brought forward to confound us.

THE FORTHCOMING INTERNATIONAL SANITARY CONGRESS.

The fourth International Congress of European sanitary reformers is about to meet at Geneva. The discussion will be held at the University from the 4th to the 9th of September, and an exhibition of sanitary appliances at the Plain Palais from the 1st to the 15th of September. Considerable care has been displayed in the organisation of the congress, and there is every prospect of a brilliant success. Dr. Paul Bert and Dr. A. Proust, both members of M. Gambetta's cabinet, will be present and read papers, while M. Pasteur has prepared a special treatise on the "attenuation of virus." A programme of the proceedings, published in pamphlet form, and in German and French, gives not merely a list of the subjects to be discussed, but a synopsis of the arguments of the opener of each discussion, and this, with respect to the meetings of the sections as well as the general meetings. Thus we find that the third section embraces all the questions relating to architecture, engineering, and industrial hygiene, and we are promised a paper on the all-important problem of the disposal of sewage, by M. A. Durand Clay, chief engineer of the Paris Ponts et Chaussées, professor at the Écoles des Ponts et Chaussées and the École des Beaux-Arts. Dr. T. Moore, of Columbia, United States, will give some account of American ideas on this matter. Then M. Lasius, of Zurich, professor of architecture of the Federal Polytechnical School, will describe a simple, economical method of warming and ventilating workmen's dwellings. M. Bourrit, professor of architecture at the Lausanne Academy, is to speak on the hygiene of private dwellings. Dr. Brouardel, professor of forensic medicine, and Dr. Armand Gautier, demonstrator of chemistry at the Paris Faculty, will read papers on incidental poisoning by small doses, such as that produced by lead paints, wall-papers loaded with arsenic, &c. Finally, M. Émile Trélat, whose name will be familiar to our readers, will discuss the advantages and disadvantages of permeable coatings to inhabited dwellings.

In the other sections, and at the general sittings of the congress, which will be held in the afternoons, there are many questions that must at least indirectly interest architects. For instance, the contagious nature of phthisis, now generally admitted, increases enormously the importance of domestic sanitation. We look to cleanliness, good drainage, ventilation, and disinfection as the means of reducing the death-rate from the zymotic diseases, which are the cause of fifteen out of every hundred deaths; but now it will be demonstrated, at the third general sitting of the congress, that these same means will tend to destroy the virus of those chest diseases which kill in England twenty-six out of every hundred persons. Good sanitation will, more than any other cause, contribute to reduce the prevalence of consumption. The discussion on short-sightedness will also involve many questions of practical interest to the architect; notably, the best means of providing light in class-rooms. A very elaborate paper on typhoid fever opens out the entire question of house drainage and public sewers, while another debate on hospital barracks also promised to be of special interest. Such are the subjects particularly fitted for discussion by architects and sanitary engineers; but, of course, every subject inscribed in the programme is of general interest to the sanitary reformer and student.

England, as usual in these International gatherings, is poorly represented, though we are glad to notice the promised presence of the Nestor of sanitary reform, Mr. Edwin Chadwick, C.B., who will read a paper on the principles of sanitary administration in England. Perhaps at the last moment, however, a larger number of Englishmen will be present to take part in the proceedings, though, as yet, there are hardly any English names inscribed in the list of speakers. Of course, the official language of the congress will be French, but speeches in other languages will be allowed, and a summary translation made on the spot. The terms of membership are simple, and its privileges extensive. A letter stating qualification,—and the only qualification is that of studies which have a tendency towards the preservation of public health,—should be sent, together with a subscription of twenty francs, to the Secretary General of the Congress, Dr. P. L. Dunant, 4, Rue Puits St. Pierre, Geneva. In exchange, a full report of the proceedings will be received, the programmes, &c., and a document which will serve as a gratuitous ticket from Geneva to Calais. Thus the expense incurred by members will be for the single and not the double journey. We trust, therefore, that England, the leading nation in sanitary science, will not be among the last to send representatives. In all probability from sixteen to eighteen nationalities will have some representative men present, and in many instances these are selected by their respective Governments. In England all depends on the initiative of private individuals; but we trust that the spirit of enterprise among our sanitary reformers, in the Social Science Association, for example, will not be as wanting on this as on former occasions. An excellent opportunity is now offered of carrying far afield those principles of hygiene which we hold dear at home. Continental sanitary reformers all feel that, on these subjects, England can speak with the voice of experience; and yet, when after an interval of two years, this great international gathering takes place, it is found that but few Englishmen are present, and that the majority of these are utterly unable to deliver a speech in French. From Russia, Germany, Italy, Spain there are brilliant speakers, familiar with all the graces of French oratory; and as Englishmen are, as a rule, better linguists than the Latin races, we can see no good reason for being so poorly represented.

TISSANDIER'S ELECTRIC BALLOON.

The balloon is at present the only apparatus by means of which man is able to rise in the air. In future, when suitable motors and contrivances for directing them have been invented, we may find it possible to pass through the air like birds. The solution of such problems ought never to be decried as impossible, although with our present mechanical and physical aids it need not be expected. If we now desire to ascend to the clouds, we have to fall back upon the balloon with all its imperfections. Ever since the balloon was first invented, it has been the constant endeavour to find means and provide methods for navigating it. Many proposals have been made, of which not one has been successful, and a good many have been absolutely ridiculous. We witness how ignorant inventors equip circular balloons with sails, without considering that the balloon floats quietly in the moving masses of air, and, if once separated from the earth, receives no longer wind pressure from the side. Others suggest the employment of wheels and other means, which may serve on land or in the water, but not in the air for a practical horizontal motion.

The first experiments of any importance for directing the movements of balloons were made in 1852 by Henri Giffard, the later inventor of the injector. Giffard was the first to point out that, in order to obtain a slight horizontal movement, an elliptical form must be given to the balloon, so as to reduce the resistance in the air, which for the greater part depends upon the section of the balloon, to a minimum for the movement in the direction of the longitudinal axis. In that year, Giffard constructed an elliptical balloon of a cubic contents of 84,650 ft., 145 ft. long and 39 ft. in diameter in the centre. The balloon was held by a network upon a central wooden beam, at the end of which was fixed a sail serving as a rudder. A small high-pressure engine was fixed in the car, revolving an air screw 110 times per minute. The balloon was filled with ordinary gas. Giffard made his first ascent with this balloon on September 26, 1852, and attained a horizontal speed of 7 ft. to 10 ft. per second, which, however, was considerably exceeded by that of the prevailing wind.

In 1872 Dupuy de Lôme made a similar experiment with a balloon of a volume of 105,945 cubic feet, which supported thirteen persons, who turned the screw themselves; but he obtained no better result than his predecessor. If Dupuy de Lôme had employed an engine of corresponding weight, he would have had a motive-power ten times as great at his disposal; but he considered a steam-motor as too dangerous. To use fire under a balloon filled with hydrogen gas, the most combustible of all gases, would be to suspend a Damocles' sword over the heads of such experimenters. An insignificant leakage in the balloon and a passing spark would be all that is required to cause the immediate destruction of the balloon with its passengers. A steam-motor, moreover, loses constantly in weight, as it emits 22 lb. of water in the form of steam per hour and horse-power, and during the same time consumes 9 lb. of coal. If, consequently, the balloon is balanced at starting for a certain elevation, it becomes constantly lighter, and will continue to rise. Of course, the steam raised could be again condensed, and the gas of the balloon used for firing; but, by this arrangement, the whole apparatus would become more complicated, and the general risk increased. Very light and powerful engines have been constructed which may, at some future time, become very useful for aërial navigation, but which, nevertheless, have little prospect of success with a gas-balloon on account of their dangerous nature.

We thus arrive at the application of stored electricity as motive power for the air screw, as shown in the model by Gaston Tissandier at the Paris Electrical Exhibition. M. Tissandier stated, in his lecture before the French Academy of Sciences, that the recent improvements made in dynamo machines and the Planté secondary battery for storing electricity induced him to make experiments with a view of using them for aërial navigation by means of balloons. Secondary batteries are light, contain a large amount of motive power, and thus offer special advantages for this case, as they constitute no danger to a balloon filled with gas, do not lose in weight, and may be put in and out of action in the simplest manner. M. Tissandier's experimental balloon was of an elliptical, pointed form, 11 ft. 6 in. long, and had a diameter of 5 ft. in the centre, and a volume of 484 gallons. The balloon was filled with pure hydrogen gas, and had a lifting power of about 4½ lb. A Siemens motor, constructed by G. Trouvé, and weighing nearly half a pound, was fixed to the lower end of the balloon, and revolved a double-bladed screw of 18 in. diameter, at the rate of 6½ revolutions per second, by the aid of a Planté secondary battery, propelling the whole aërial vessel at a speed of 3 ft. per second for fully forty minutes. With two secondary elements weighing 1½ lb. each, and a screw of 21 in. diameter, the balloon attained a speed of 7 ft. per second for ten minutes.

M. Tissandier had a second model constructed of 13 ft. in length, which was to be seen at the late Electrical Exhibition in the Palais de l'Industrie. The balloon was conducted through the building on a wire stretched across it, as it is still to be seen in the Conservatoire des Arts et Métiers. The weight of the motor and the element was less than 4 lb., so that it did not exceed the lifting power of the balloon, and the whole apparatus was not suspended on the wire, but was merely guided by it. The screw, of a diameter of 11 in., was revolved by a Trouvé machine of a weight of ½ lb; the speed depending upon the tension and the quantity of the current. The apparatus was supplied with an adjustable rudder. The large electric balloon projected by M. Tissandier is to have the following dimensions. The electric machine is to weigh 5 cwt., and the secondary batteries 17 cwt., representing about 5 horse-power. These will be carried by an elliptical balloon of a volume of 106,000 cubic feet. The balloon is to be 131 ft. long, and its diameter in the centre 60·7 ft. The balloon would have a lifting power of 3½ tons, and consequently would be able to support 1 ton weight of passengers, ballast, &c., besides the batteries and the machinery. With the air calm, its speed would be from twelve miles to fifteen miles per hour, which, of course, could be maintained for only a few hours. M. Tissandier intends constructing such a balloon shortly, and undertaking voyages with it over and round Paris. The problem of aërial navigation can by no means be considered as solved with this balloon. Even if the first experiments should not give satisfactory results, some advantage will be gained by the general evidence they will supply of the practicability of the idea.

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AN AMERICAN WRITER ON ENGLISH ARCHITECTURE.

The well-expressed opinions of the cultivated traveller on any country that he may visit invariably afford instruction; a special interest, however, is attached to the views of the American visitor to our shores. There is that sufficient community of language, literature, history, and traditions between us and our cousins, the absence of which leads on the part of all other "foreigners" to such amusing expressions of opinion regarding our country as, from time to time, are to be met with, even from highly-educated sources. It is additionally interesting when we have brought before us the views of a cultivated literary student, such as Mr. Richard Grant White, who, in his lately-published work, "England Without and Within," has given us the result of his experience during several months' residence among us. A glance suffices to show that his work is not the crude ill-digested expression of the hasty traveller or sight-seer, but of an observer who, long before reaching our shores, has prepared himself by a lengthy course of reading and thought.

To the cultivated American, England is always "the old country"; what, we have Mr. Morley's recent assurance, Longfellow once said of his countrymen, that they were only Englishmen under a different sky, is largely felt to be true throughout all the eastern portion of the States, by all true Americans, of whom Mr. White is so characteristic a specimen. As a self-styled "unmitigated Yankee, not one of whose forefathers had been in England for 240 and odd years," Mr. White, like his countryman, Hawthorne, shows more than once his contempt of the far too lightly styled "Americans," who may, it is true, hail from the States.

Mr. R. G. White's work has so far received from the reading public in this country a most flattering reception; and very interesting, not only to its American but to its English readers will much of the work be found. In most cases the views of the author are clearly the result of well-weighed consideration; but there are points over which our critic might have passed with less confidence of tone. It is not our intention, nor indeed would it enter within our province, to speak generally of Mr. White's work. It is to the casual reference made by the author to the artistic beauties he had the opportunity of seeing during his visit that we wish to draw attention.

Mr. White seems to us to show want of the critical faculty, to say nothing of historical reverence, when he speaks as he does of St. Paul's as "outside and inside the ugliest building he ever saw." "Its forms are without beauty, its lines without meaning, its round windows are ridiculous. Its outside is not only ugly in form, a huge piece of frivolity, but its discolouration gives it a most unpleasant look." The reverence which the author so constantly expresses failed him singularly here at a point where it was most wanted. Our author's criticisms are scarcely less severe when he declares the City public buildings to possess the beauty of fitness, "for they look just what they are,—the creations, the abode, and the stronghold of British Philistinism,—rich, substantial, tasteless, and oppressively respectable"; again, he will find few to agree with him when he complains that even distance cannot render the Houses of Parliament "imposing," a fault which, whatever may be the faults of Barry's grandiose design, could not possibly be found by any one who has ever enjoyed the privilege of observing constantly from Westminster Bridge the long pile under the varying aspects of sunrise and sunset; while we can imagine Sir Edmund Beckett's feelings when Mr. White expresses his delight at "the grand, sweet voice" of Big Ben. But the *finale* of this paragraph is perhaps the most curious. "The parish churches are mostly by Wren or in his style, and are ugly with all the ugliness possible to a perversion of the forms of Classic architecture."

Though such opinions are somewhat calculated to weaken one's confidence in our author's judgment, yet it must be agreed that he is right in not finding that the newer parts of London near South Kensington are externally very interesting; he finds, however, that the houses are very handsome. "The pretentious talk I have heard about Fifth Avenue houses leads me to say that there are hundreds of houses in the best parts of London, around Hyde Park, on Carlton-terrace, and in other like places, which are far finer, much more noble, as Pepys would have said, than any that are to be found in New York, in Boston, or in Philadelphia." And our author here compares the modern houses of London and New York; the difference, he asserts, being "that the former, while less showy than the latter, are more spacious, and have more of the dignity which accompanies large and well-proportioned size. . . . . The notion that rows of houses all alike are not found in England is altogether wrong; in the new parts of London such rows, and of very handsome houses, are common, while in the new parts of smaller towns the houses built for people of moderate means stand in rows of from a dozen to two dozen, as like each other as one brick is like another." In our shops, Mr. White complains of a remarkable "absence of show and pretension, and he utters a very justified complaint respecting the irregular manner in which the streets are named and numbered. Of Fleet-street our author has naturally much to say, of the Old Cock Hostelry and the quiet Temple Gardens; he expresses his surprise at the ruthless way in which we demolished Temple Bar, though the surprise is qualified by the remark that "the removal of the obstruction, architecturally not very admirable, shows how, at the last moment, the English mind can rise to the emergency of a great reform."

We can thoroughly understand Mr. White's "new and delightful sensation" of surprise at finding a town like Windsor so little increased in size after its centuries of existence, a town "neither great nor growing," and plainly without enterprise. "It gave rest to a certain stunned and weary feeling which comes upon one in the streets of New York, and in the streets of other places which are daily, with more or less success, doing all they can to be like New York, that dashing, dirty demirep of cities." Old and enthusiastic student of Shakspeare as Mr. White was, he was wise enough not to allow himself to be carried away at Windsor, where so few traces of the haunts spoken of by the poet now remain; indeed, as our author admits, he "found little of interest; the town is not new, but it is modern, and its Elizabethan features have all been improved away." The incident of the ruins of a burnt house meeting our critic's eye affords him the occasion to give us his opinion of the mode in which many of our English houses are built. "The house had not been wholly destroyed, and the skeleton still held together. It seemed to have been built some forty or fifty years ago. I was surprised at the flimsiness of the construction. The bricks were poor, and the mortar was bad. A house so built may be found anywhere, and I should not mention this, but as the occasion of remarking that I found the same inferior builder's work wherever I went in England. According to my observation, modern English houses, unless they are built with special care and unusual expense, are very slightly put together with bad materials and poor workmanship. It is the custom to put up the shells of houses, usually three or four together, and to leave them to be finished according to the wishes of an intending tenant or purchaser. I examined many of these without finding one even tolerably well built. . . . . The mortar, although it had been set for years, would crumble under the touch of my stick, or even my thumb-nail. And walls of the modern-built villa houses that I visited were rarely more substantial, while the joiners' work was both slight and coarse. I also remarked that where recent additions had been made to the height of garden-walls, the mortar in the new parts, although in general it was plainly ten or twenty, or even thirty years old, was more like mud than mortar. Indeed, I did not see in England in a new private building of moderate pretensions, any mortar worthy of the name. This attracted my attention, I need hardly say, because of the notion generally prevailing and sedulously encouraged by British writers, that all English work is distinguished from other work of its kind by excellence of material and thoroughness of workmanship; that although it might not have elegance, it was sure to be substantial. I did not find it so. In this respect, in many ways I was disappointed. That such was once the character of the work of English artisans and manufacturers is not to be disputed, but during the last fifty years this glory of England seems to have departed." Severe as is this view, must it not be admitted that in too many cases it is only too true?

Windsor Castle, Mr. White, of course, saw pretty thoroughly, but probably the most interesting portion of the chapter, "A Day at Windsor," is devoted to the description of the antique and far too-little known Church of St. Andrew at Clewer, one of the oldest in the kingdom, and concerning which we can thoroughly believe our author finding many grown-up Eton boys had never seen.

In his chapter on "Rural England," in comparing our cottages, picturesque though the writer admits them to be, he is of opinion that the corresponding unsightly wooden houses of the United States, "in real comfort and in healthiness, are superior; for they are dry and warm. Their shingle roofs keep out the rain, which comes through thatch, or soaks and rots it, and their clap-board sides do not become reservoirs of cold dampness. Rheumatism is not so common among those who live in them as it is among the English rustic folk," while a very proper mention is made of the carelessness in our villages respecting the objects that are "in unnecessary nearness to the house." "There are no indications that the inhabitants are anything more than tillers of the ground, and that when work is done they put it and its belongings out of sight and out of mind, and change their occupation with their clothes." Indeed, we can understand any one accustomed to the comfort and independence to be met with among the farmers of New England and the Middle States being somewhat surprised at the condition of the corresponding class in the old country; but, as our friend admits, whether they would be such good farmers "I very much doubt; whether they would have been more respectable men, or even happier, I shall not pretend to decide." The chapter on "Rural England" is of great interest, and the result of much observation. To many an English reader it will afford valuable matter for reflection. The same may undoubtedly be said of the succeeding chapters on English Men and English Women, on English Manners and Habits, on "Nobility and Gentry," and several others.

Hampton Court gives Mr. White another opportunity for an attack on poor Wren. "The first sight of the palace itself," the writer remarks, "is very disappointing, for the principal front which it presents shows, at a glance, the hand of the architect of St. Paul's." The seventeenth century, in spite of its peculiar interest, literary and historic, and its essential connexion with the New England of which Mr. White is so characteristic a citizen, comes off hardly at his hands. Speaking of the famous Lely beauties, our friend remarks that they are "poor, flimsy, meretricious things." Had his remark been applied to the originals, we could understand it from so stanch a descendant of the Puritans of the *Mayflower* days, but he goes further when of these portraits he says that, "Even the flesh tints, which are the best part of them, are weak and washy, and the drawing is very bad. The eyes are, I think, the worst that I ever saw in paintings of any pretension." We are sorry to see our critic going beyond his province, his views, social, political, and historical, it is instructive to hear, but his artistic criticism not possessing the same solid foundation of experience we must object to. The remark made during a walk from Twickenham to Hampton Court, on the high-sounding names given to some of the "scrubby little roadside cottages with a neglected patch of earth or grass before them," which the writer met with on the way, is more to the point.

The chapter entitled "A Canterbury Pilgrimage" contains some interesting and carefully gathered information. "There is no place in England," truly remarks Mr. White, "excepting London and Westminster, which is so enriched by memories and by memorials of the past; and yet I found intelligent, well-educated men in London and elsewhere, not three hours away, who had never seen Canterbury and its great cathedral." Mr. White, of course, put up at the "Rose" inn, on the difference of which from the hotels of his own country he has much to say. Our author is charmed with our inns, where "you do not feel as if the house were a mere continuation of the street, except the paving-stones and the carts and horses." With Canterbury our author is enchanted, as a town which like so many others in England has "manifestly grown and not been made to order, not put in sections by con-

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tract . . . . one house built in a certain place, and in a certain way, because its builder chose to build it there and in that way"; and this charm of our old towns which appeals to the American visitor, let our builders see that they respect and endeavour to continue. Mr. White, though he admits he did not go to Canterbury to "mouse among antiquities nor to study architecture," after seeing the cathedral, with which, of course, he was much impressed, did not neglect to visit St. Martin's Church, with its thirteen centuries of hoary antiquity, that lie buried beneath the ivy that clambers round the old tower and over the Roman bricks of the walls.

Speaking of Cambridge, our author remarks that the architectural interest of Oxford "is so great that Cambridge is too much neglected in this respect. Its college buildings are so beautiful that only to see them would be worth a journey from any part of England,"—a statement that all who know the old town will fully bear out. Oxford and Cambridge, with many of their interesting traditional customs, are well described by Mr. White, who had the advantage of excellent introductions to the authorities. Of Oxford he does not hesitate to say that "it is the most beautiful place" he saw in England; indeed, he is inclined to think "the most beautiful town in the world," and Mr. White warmly urges on his countrymen who may visit England "with a desire to see its characteristic beauties to give at least two or three days to Oxford."

It is a serious and lengthy chapter,—one dealing with a subject which, as Mr. White himself says, is of equal importance to his countrymen as to us,—the chapter on the "National Vice" of drunkenness,—a vice of which, however, "it is to be said," he remarks, "that there are reasons for it, which do not exist in other countries. England lacks good" [this he explains afterwards as meaning "soft"] "water, and produces no wine." The statement that "many people cannot drink the water of England unqualified, without being made ill," can be thoroughly borne out by fact. Mr. White is not severe on the national vice: he only bewails its prevalence, and particularly its saddest form, among the women; he is only one more of those who openly aver that "such steady besotted drunkenness seems to be at the bottom of much of the distress and most of the crime in England." It would seem, however, our author concludes, that we are gradually freeing ourselves of the vice. Abstemiousness in England is not so easy or desirable as it is in America, "and hardest, although most desirable of all things everywhere, is not abstemiousness, but temperance."

Mr. White, of course, does not neglect a description of the obligatory pilgrimage of every good American to Warwick and Stratford-on-Avon; for even those Americans who are only hurrying through our country to Paris never fail to visit Shakspeare's birthplace, "the proportion of these being very much larger," remarks Mr. White, "than that of the cultivated Britons who render their personal homage to him whose works are our richest common inheritance." But with Stratford Mr. White is sadly disappointed. "The truth is," he admits, "the Stratford that I knew (and about which I had read so much, and the topography of which I had studied until I could have gone straight to every place I wished to see without a guide) was Shakspeare's Stratford, and that has passed away. The truth is, that in the stead of old Stratford, there is now a successful place of business"; and he concludes, after describing his other disappointments, by advising no one to go to Stratford "who would preserve any elevated idea connected with Shakspeare's personality"; but we consider Mr. White is going too far when he roundly declares of the poet's monument in the church that "it is ugly; the staring painted figure-head-like bust hideous."

On his return to London our author admits to a positive feeling of "getting home again," as, in spite of the little beauty of our metropolis, its dulness and dinginess and commonplace character, yet the whole of it outside of the City proper has a home-like look." Some of our streets remind Mr. White of the thoroughfares in his own country, a fact which any one who knows America can fully bear out. "There is," in fact, as he very sensibly points out, "no indication of a difference of character between the people who built London and those who built New York and Philadelphia. The unlikeness is produced simply by the fact that the newer and larger parts of the latter places were laid out, projected, and that the whole of the former slowly grew;" however, as an impression, Mr. White admits to finding "striking" the general unlikeness of London to towns in the United States, an unlikeness "very much greater at the present day than it reasonably should be." Certainly, the older parts of New York singularly resemble the older parts of London. On our London statues Mr. White does not exercise his usual artistic severity of criticism; he even finds their number "great." "It could hardly be otherwise in the capital of a country with such a history as England's." Compared with New York and the cities in "the States." this is, of course, true; but it hardly suffices when we think of the Continent.

Without any affectation of thoroughness, Mr. White has placed before his countrymen, and, indeed, before English readers, who, perhaps, will most profit by a perusal of his book, a curious and instructive picture, which fully answers to its title, of "England Without and Within."

THE WOODWORK OF MODERN HOUSES.

It is at all times a matter of satisfaction to those engaged in the building trade to observe, during the demolition of buildings that have been erected for fifty years or more, the perfectly sound state in which the timber taken out of them is usually found to be.

It is, of course, to be expected that oak, and such other English hard woods as were introduced into buildings before foreign building woods were so largely imported as is now the case, will remain sound even after the lapse of a considerable length of time. Our references do not, however, relate to English woods, but to the building woods now in common use.

Similar woods are continually being taken out of buildings that have been erected for fifty or sixty years, and we find them generally to be in a perfectly sound state.

Those whose recollections of the building trade date back for such a length of time are able to remember that many of the convenient sizes now imported in the shape of deals, battens, and boards were formerly unknown, and that the bulk of the foreign timber that was then imported reached this country in the shape of hewn logs, which, on their arrival here, were sawn into the required shapes, mostly by the laboriously slow process of "hand-sawing."

The complete development of the foreign sawn-wood trade does not, indeed, date back any great number of years. The practice of sawing the hewn logs on this side was at once a slow and costly process, and concurrently with the improvements which were introduced in respect to wood-working machinery, the foreign sawn-wood trade developed with rapid strides.

Although, however, the wood began to be shipped, for the greater part, in a sawn state, the sizes in which it was shipped were very few. For a long time even the merchants on this side did not welcome any innovations in respect to sizes, and, as we have remarked, it is only of recent years that the trade can be said to have completely developed. At that period Norway began to export sawn wood.

It does not appear to be generally known amongst those who make use of wood as a constructive material, that the wood shipped to us from Norway is, taking it all round, of a much inferior quality to that shipped from Sweden or Russia. Otherwise it would be difficult to account for Norwegian wood being so often specified for purposes for which it is altogether unsuitable.

It is well that it should be widely known that the trees of the Norwegian forests rarely attain to a size sufficient for anything larger to be cut from them than small-sized battens, and that what few larger sizes are capable of being produced are generally extremely sappy, or otherwise are affected with taint.

It is, perhaps, not too much to say, that the elements of decay are always more or less present in Norwegian wood, and that, under favourable conditions, the symptoms of decay rapidly develop.

Whilst directing these remarks particularly to Norwegian wood, we should not overlook the fact that there is annually being shipped to this country a large amount of Swedish wood which is altogether unfitted for building purposes. The trade designation of the quality of such wood is usually "Fifths," and occasionally "Sixths" quality, and it may be remarked, as a matter for dissatisfaction, that the importation of these lower qualities has of late years been largely on the increase. There are several reasons which could be furnished for this being the case.

One reason is, that the immense importations of foreign building woods that have occurred have, in some parts, practically depleted the accessible forest lands of their best growths, and trees are to-day being converted into deals and battens which, in the early days of the importations, would certainly have been discarded.

Another reason is that the fierceness of modern competition is such as to induce some builders to take work in hand to do for less money than it is capable of being done for; and in the endeavour to turn it out at the lowest possible cost there have been builders who have been induced to introduce a class of undesirable wood, although they have possessed a full knowledge of the inferiority of the article. In cases where there has been no efficient clerk of the works employed, architects have been hoodwinked, and, in their absence, the inferior wood has been placed in position.

The gravest cases have, however, occurred when there has been neither architect nor clerk of the works employed to superintend matters, and when the property has been erected merely for speculative purposes. In many such cases,—we say it advisedly,—absolutely-rotten timber has often been introduced into new buildings.

In what may be termed common speculative house property, endeavours are being constantly made to "scamp" the sizes of the bearing-timbers, which are being pinched in every direction.

Deals, 3 in. by 8 in., are made to do service for 3 in. by 9 in. deals; battens, 2½ in. by 6½ in., are substituted for 2½ in. by 7 in. Such sizes as 2½ in. by 6 in., 2½ in. by 5½ in., 2 in. by 6 in., 2 in. by 5½ in., 2 in. by 5 in., and 2 in. by 4 in. are "squeezed" into service; and in the generality of cases legitimate strength is being robbed.

Even taking the case of flooring-boards, which it might well enough be thought would not be laid down of a less thickness than 1 in., they are now frequently cut three out of a 2½-in. batten, instead of being prepared out of foreign sawn boards, which always run full of wood, and consequently can be produced planed without their thickness being reduced below 15-16ths of an inch.

It is not the case that all architects are aware that such sized battens as 2½ in. by 6½ in. are largely imported, and so it sometimes occurs that when 2½ in. by 7 in. are specified, and 2½ in. by 6½ in. are used in their stead, exception is not taken to what are regarded only as badly-manufactured battens, some of which appear to be strangely short of wood, but others of which may measure a trifle over the specified size. The fault,—if looked upon as a fault,—is regarded as being unintentional, and is therefore generally excused.

The important part of the case to property-holders, and especially to those who have made money advances upon property, is that these "off sizes" of small stuff, such as we have mentioned, are, for the greater part, shipped from Norway,—and Norway wood, as we have pointed out, is undesirable for building purposes, on account mainly of its proneness to decay.

High-class, and, indeed, respectable, builders generally, do not buy Norway wood, excepting, perhaps, the imported Norwegian flooring-boards, and the best wood in Norway is selected for flooring purposes. The remarks, therefore, which we have made, will be objectionable only to a class that have done much injury to those legitimate contractors whose desire it is to turn out good work.

To such builders as desire to do their work well, equally as to architects and clerks of works, it is important to explain that an immense amount of very common building timber is annually being imported, and that this timber generally goes into consumption immediately upon its arrival.

It does not pay importers to keep such stock on hand, because it is a quality which rapidly deteriorates, and therefore it is pushed off at the best obtainable figures.

Purchasers of house property which has been put up on speculation should insist upon some of the flooring-boards being taken up here and there, so that the condition of the joists can be sufficiently examined, and any deficiency in the quality of the wood used detected.

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Architects being made aware of the fact of the increased importation of "fifths" and "sixths" qualities of Swedish red wood, will do well to take precautions against the larger sizes of redwood deals being introduced of too inferior quality.

It is a logical surmise that so long as the importation is on the increase the consumption is equally on the increase, and it is quite possible that all the inferior wood is not used up in speculatively-built house property.

We are inclined to the belief that common wood is not largely used for joinery work. There is little economy in using inferior wood when much labour has to be bestowed upon it; and even common-class builders have been wise enough, it seems, to recognise this fact.

Yet, even in respect to wood used for joinery purposes, it should be borne in mind that steam power machinery is more largely every day brought into service, and that a commoner class of wood can be worked up by the aid of machinery than can profitably be used when the articles are produced by hand-labour.

The firmness of a building is not, however, affected by the quality of the joinery work. It is almost alone with the bearing woods that we have to deal, and the most important feature is, that the bearing timbers are hidden from view, and consequently their unsoundness is not likely to be detected until some catastrophe occurs.

It may be reflected that few accidents arising out of the inferiority of wood have to the present occurred. What is desired to be pointed out in this paper is, that the heavy importation of the inferior sorts of wood have occurred during recent years, and that the effects of these importations have yet to be experienced.

Our forefathers paid an infinite amount of respect to the durable qualities of English oak; and although still relying upon the useful, cheap, and abundant building woods which are now shipped to us from Northern Europe, and from the New World, some of our modern house-builders would do wisely to follow their ancestors' example, and, seeking to do fair work, discard the use of woods the quality of which it is not fitting should be employed, and make use only of building timber of a legitimate quality.

In respect to contract work, the case rests very much with architects, for if clients are advised to accept, under any circumstances, the lowest tenders, without respect to the reputation of those estimating, there will always exist the risk that a certain class of builders, who are in the habit of sending in low estimates, will seek to recompense themselves by making use of inferior and insufficient material.

SWALEDALE AND ARKENDALE.

Some of the Yorkshire dales have been long known for their beauty and for their historic associations. Turner did much to popularise Wensleydale, and the poems of Wordsworth largely contributed to the opening out of other dales; but some of the Yorkshire valleys are still unknown regions, even to the great bulk of the tourists. One of these districts that is comparatively little visited is that of Swaledale and Arkendale, or Arkengarthdale. Partly because it is on none of the great roads, partly because of the absence of railways, and to some extent because it contains no town of great population or importance, the district is one that is not much visited. But though it has not the pastoral beauty of Wensleydale, there are attractions and associations in the more northern dale that should not be overlooked, and that make it and its adjoining valley worth a visit.

Richmond is the terminus of the railway. It is an ancient town, whose impregnable rocky castle looks down upon the little river Swale, and shelters the rugged stony little town that struggles along the brow of a hill, and down its sloping sides towards the woods of Easby. That old castle is so seated on the precipitous bank of the Swale that it literally fulfils the words of the laureate, and "clasps the crag with crooked hands." Seven hundred years have passed since the erection of the noble keep, but its dimensions are still vast, and its masonry fresh, and on its rock, with the river rippling below, and the ivy about its ruins, it is the first object and the chief that strikes the eye. From its ancient hall there is a view so grand that when George, Prince of Wales and "first gentleman in Europe," visited it, he declared it commanded the noblest prospect he had ever beheld. To the south there rise the hills that shut in the valley, to the north the town is at the foot, whilst east and west the course of the river is through changing woods, and past temples, abbeys, and ruins, that make it a prospect without a dull inch. Richmond is a town of ruins. The gazer from the castle walls sees the little cell of St. Martin's near the parish church, the ruins of Easby Abbey, standing "most stately and delicate aslant the sparkling" Swale; and the solitary tower of the Grey Friars rising from four of the "most graceful arches in the north." It is a town that has had its history, and that connects a sedate present with a troublous past. It was the chosen seat of lordly families,—the Scropes, the Marmions, and the king-making Nevilles. Its earls and their vassals fought at Flodden Field and Bannockburn; near it some of the great religious houses fixed seats; the Roman roads passed close to it; and Cataractonium brings up the memory of the conquering people. Three centuries ago Leland described Richmond Castle as "in mere ruine," but it still keeps stately guard over the pleasant little town, and preserves the continuity of the memories of the past.

Upwards, the course of the Swale is through a land where industry, except that of agriculture, is on a miniature scale. Some bold bluffs shut on the scene from the sight in Richmond, but the course by the river-side road is one that is pretty and pastoral. The road winds with the river at a low level, and the sound of the stream is in the ears most of the way. The roads are not tree-shaded, but high hedges grow, dotted here and there with trees. The land is chiefly pasture, and only occasionally is there the farmstead or the cluster of cottages that form here the village. Upwards, on either side, the land rises, field after field in glowing green, until the open moor crowns it, or to the north-west Arkengarth, as in the days of Scott, "lies Sark afar." Reeth, a small town some twelve miles west of Richmond, may be said to be the centre of the dale. It is isolated, remote from railways, and without distinctive industry, except the lead-mining that in the adjacent hills has been pursued for many generations. So secluded and so pursuing the even tenour of its way, Reeth is a spot where life idles. Spring visits it tardily, but flushes all the valley with tender green, and throws a glamour over the hills that shut it in. The little Arkle here joins with the Swale, and the high hills and limestone scars, the green valley, with its fringe of trees near the river, and the grey farmhouses, form a picture of peaceful rural life that the absence of the smoke of a locomotive adds to. Here the dale branches. To the north Arkengarth-dale runs right up into the moorland, whilst westward the path by the Swale leads ruggedly up by the great limestone hill at Keasdon, and the pretty waterfall there to the junction on the bleak uplands, and the watershed of the Swale and the Ure, the Lund and the Eden. Beyond Reeth, either way, the scenery loses its sylvan character, and borrows a little of the gloom from the hills it winds near. From the little hamlet of Arkle to Tanhill, the road runs close to the Arkle beck, and the ripple of the water is the only relief to the dreariness and the isolation of the road, which passes under the shadow of Taylor Rigg, Stainmore's "shapeless well" being to the north. Moorland leads away towards the fair valley of the Eden. The other path, along Swaledale, passes Healaugh, associated with John o' Gaunt, the pretty mining village of Gunnersdale, where a glen sends down its lead-tinted stream, and Muker, where roads to other dales strike off, and which is the capital of Upper Swaledale. Beyond there is Keld, and the road rises till it lands itself on the debatable land where the borders of two northern counties meet.

It is a wild region, but it has its charms. Its industry is that of lead mining, pursued in a primitive style. In and near some of the village streets you may see the old-fashioned "buddle," and in one at least the washing of the lead is done by females. The arrangements of the industry and the modes of payment are of an antique type; the weights are ancient ones, and the types of character of the workers and of the whole of the Dale population are in an olden groove,—"frosty, but kindly," thrifty,—as they needs must be,—hospitable, taciturn, and somewhat grave. The few miles that take us from the crowded populations of the coal-mining districts of Durham seem to have also taken us back a century or two; and the passing of time here is not that of the fever-throb of towns, but that of the regular quiet of Shakspeare's shepherd. It is a life that has its round broken only by the variations in the seasons, and the fluctuations in the slight return to the lead-mining industries; but it is, on the whole, a contented life in a quiet, peaceful, and pastoral district.

RUSSIAN NEWS.

The desire of various members of the Architectural Associations of both St. Petersburg and Moscow to profit by the Russian National Exhibition now open at the latter city, has led to some practical steps being taken with a view of holding an architectural conference at Moscow. Moscow, indeed, has never been known so full in summer-time as it has been this year. The exhibition has attracted a large concourse of people, a large proportion of whom come with the desire rather to learn than to seek amusement. For an architectural congress the moment is also favourable. Several members of the societies have for some time been in consultation to decide upon a programme of the proceedings. It is almost needless to say that not only the numerous architectural models and other objects which form a department of the exhibition, but also the many and varied architectural monuments of the elder metropolis, offer great advantages for such a gathering.

Fires are probably more frequent in Russia than in any other European country, on account of the houses being almost everywhere, except in a few large towns, constructed of wood. The cry of *pazhar* (fire) is one but too familiar to Russian ears. It is worthy of note that nearly all the Russian insurance companies have decided to make an auxiliary gift from their funds to the various fire-brigades which have shown special activity and effectiveness.

The destruction of the Elaguin Bridge has drawn attention to the desirability of some means of securing these structures, which in Russia are very frequently of wood, from the danger of fire. The Town Council has proposed to insure all the wooden bridges within its jurisdiction for the sum of 1,200,000 roubles. In the same connexion Mr. Spijeshnev has again brought a preparation, invented by him for covering wooden structure, and thereby rendering them uninflammable, to the notice of the St. Petersburg Town Council. Some time ago this preparation was examined and approved by the Technical Department of the Municipal Administration, and subsequently the head of the police, Mr. A. A. Kozlov, applied to the Town Council, with the suggestion that it should be made obligatory upon the proprietors or lessees of places of amusement to have the stage parts of such establishments thoroughly secured against the risks of fire. This proposition was made to the Council immediately after the fire at the Ring Theatre in Vienna, but was pigeon-holed for four months, during which period the Arcadia Theatre, the Krestof Villas, and the bridge were all burnt.

We may add that by order of the Governor of Nijni-Novgorod some experiments have been conducted on the large market plain, with a view to test the efficacy of Mr. Spijeshnev's protective preparation. Experiments with a like purpose are also shortly to be conducted by sanction of the St. Petersburg Chief of the Police, in the Semeonofsky Place, where a series of wooden houses, which are to be the subject of the trials, is in course of erection.

It may be interesting to know that land abutting on the new St. Petersburg port has increased about fourfold the value it fetched last year, when sites in the village of Bolynka were purchasable for from 8 to 10 roubles the square sazhen, and have now risen to from 40 to 45 roubles. A good deal of business is being done in the purchase of land at present.

The freshwater canal of St. Petersburg, which intersects the Kanonersky Island, will be filled by five syphons, which, with the aid of hydraulic machines, will fill the canal with water to the depth of 24 ft. in the course of two months.

A Russian orthodox church is to be built in Japan, under the dedication of the Resurrection of Christ. The funds for its construction are being supplied by private offerings, which will be forwarded to the Russian Church Mission in Tokio. The sums already collected amount to more than 130,000 roubles.

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Among the rather numerous competitive designs for the church to be built over the spot where the late Emperor was assassinated, we, some time back, mentioned the plans of the Superior of the Sergyeev Monastery, the archimandrite Ignatius, who studied architecture practically before he entered the ecclesiastical state. It is reported that these plans have now been approved in general, and that they will be adopted, subject to some slight change in matters of detail. For use in the edifice when completed, the brothers Buch have made an offering of two magnificent altar candlesticks, enriched with plating and gilding, and which are at present being exhibited in the Moscow Exhibition. Their value is 2,500 roubles.

Several of the imperial residences are, it is said, to be given up to public or national uses. Thus, the Catherine Palace, situate at some distance from the capital on the right bank of the Neva, and the Potemkin Palace, not far off, are to be devoted to public purposes, while the palace built for Alexander I. at Taganrog is to be given to the municipal authorities of that city with a view to its conversion into a museum of local antiquities, in which the surrounding district abounds, in consequence of the number of Greek colonies formerly existing there.

The Crimean nobility have decided upon the erection, in Simferopol, of a monument to the Empress Catherine II., in celebration of the hundredth anniversary of the annexation of the Crimean Khanate to the Russian Empire, which was completed on April 3, 1783.

It would be difficult to overrate the importance of the proposed railway in the South of Russia, and the immense benefit to trade and agriculture which it would confer. It is to extend from the Tichoretsky Station on the Rostoff-Vladikavkaz Railway, over nearly 50,000 versts to the New Russian or Odessan Bay, where, at its western terminus, a landing-place for ships is to be constructed. The chief engineering difficulties lie in the section between its western terminus and the junction for the Crimea, as here much tunnelling will be needed.

"OVERBECK."*

Mr. Beavington Atkinson has through these many years been at considerable pains to make himself thoroughly acquainted with the characteristics and tendencies of German art, and also with the lives of the great modern German painters. He has already rendered the English public good service by his work entitled "Schools of Modern Art in Germany," and he is now, we are pleased to learn, crowning the good work by writing the lives of the German artists, leading off with that of the saintly designer and interesting enthusinst "Overbeck."

The vocation of the fine arts is illustration in the widest sense, and the adaptation of illustration to its various purposes. The illustrators themselves may be broadly divided into two factions, into the spiritualistic and the materialistic schools; the intellectual faction disdaining the more sensuous elements, and the materialistic the more intellectual. These two tendencies are generally pushed to extremes by diametrically opposite natures, such as those of the austere Overbeck and the rollicking Rubens. Between the two polar extremities, the mental and the physical, the two characteristics are found variously differentiated *inter se*, now inclining to this side and now to that, but very rarely coalescing in that just and balanced proportion that constitutes the perfect union of the soul and body of art.

Overbeck was an extreme instance of the German school of some forty years since, and was regarded as such even by his professional associates, though the school itself leant to the intellectually-extreme view of the purpose of art. The opinions of those who were partisans of this German faction are thus ably summed up by Mr. Atkinson:—

"The opinion upheld was that the idea or mental conception constituted the chief value of any art work; that outline or form was the direct language or vehicle of such idea; and that colour, light, shade, surface-texture, or realism, were subordinate if not derogatory elements."

The following is the artist's own expression of these views:—

"The picture embodies not so much historic fact as an idea, the intent being not to lead the spectator to the real, but to something beyond. The purist painter, then, proceeds to express his invincible reluctance to study the subject from the side of life; models he had carefully avoided, because he feared that a single glance at Nature would destroy the whole conception."

But we should not forget that, when Overbeck and that devoted little band of German painters were promulgating those extreme views in Rome, European art was, with rare exceptions, utterly destitute of thought, and sorely needed authoritative weight to be cast into the intellectual side of the scale. The immediate effect of the propaganda and their works on the outer world is thus recorded:—

"The cause of the Germans was greatly strengthened, and the opposite party felt the defeat. The Italians, too, were taken by surprise to find themselves beaten by foreigners on their own ground. A natural consequence of the success was further commissions, and the fortune no less than the fame of the revivalists was made. Singularly enough, the modern Romans came forward as the next patrons. Niebuhr, writing from Rome in 1817, says:—'It is a significant fact that some foreigners, even Italians, are beginning to pay attention to the works of our friends.'"

The history of the German brotherhood in Rome will always remain a romantic episode in the story of art in the nineteenth century. And the life led, and the modes of study pursued by, these German pre-Raffaellites, whilst they dwelt in the old Franciscan convent of Sant' Isodoro on the Pincian Hill, and up to the time when they were commissioned to paint those famous frescoes in the Casa Bartholdi, is graphically told by Mr. Atkinson. The painting of those frescoes will become a more and more important historical incident, as it is an event from which the revival of mural painting in Germany, nay, in Europe, will date.

Human experience is, as a rule, far too limited to permit any safe inferences to be drawn regarding artistic proclivities from the personal appearance of the artist, but in Overbeck's case the personal appearance was the outward and visible expression of the spirit within. Mr. Atkinson has photographed the great man from the life:—

"The bodily and mental aspect of Overbeck is well known. I myself had the privilege of first seeing the painter when in the Cenci Palace, as far back as the year 1848. My journal describes a man impressive in presence, tall and attenuated in body, worn by ill-health and suffering, the face emaciated, and tied round by a piece of black silk. The mind had eaten into the flesh, the features were sorrow-laden. The voice sank into whispers, the words were plaintive and sparse; noiselessly the artist glided among easels bearing pictorial forms austere as his own person; meekly he offered explanations of works which embodied his very soul, timidly sought retreat, and passed as a shadow by,—the emblem of an art given in answer to prayer, and pertaining to two worlds."

It is consolatory, however, to learn that, in spite of self-denying ordinances and martyrdom by the world, he was able to bear up and preserve his facility with the pencil till his eightieth year.

Mr. Atkinson writes well and sympathetically. The advent of his book is opportune, for it is an able record of a life firm of purpose, never for a moment swerving from the mission it had accepted, with which it believed itself entrusted; a firmness of purpose that trampled many weaknesses under foot. We may criticise Overbeck's extreme bias; but, after all, the intellectual side is that "better part" which has received divine sanction in art. Overbeck not only revived art on the lines of its ancient earnestness; but he endowed it with that intellectual "strain" which has borne such good fruit in Germany, and which is destined to characterise the new art-era,—an era in which it will be sought to realise, to give form, to a wider range of mental conceptions than of old time. The "Life of Overbeck" is a standing rebuke to that host, infirm of talent and of will, who enter upon art with no other purpose than to send their "bits" to the exhibitions, and whose little best will but place them on a level with *penny celebrities*.

* "Overbeck." By J. Beavington Atkinson. London: Sampson Low, Marston, & Co.

Exeter Constitutional Club.—At a meeting of this Club on Monday last, it was announced that Mr. E. Webb's design for the club premises had been adopted, and that he was preparing specifications and working drawings to carry out the work, for which tenders had been invited.

PORTAL OF THE ANCIENT MONASTERY OF ST. DOMINGO, IN SALAMANCA.

The erection of this edifice was commenced on the 30th of June, 1524, and finished on the 18th of February, 1610, from the designs of the architect, Juan de Alava. Its foundation is due to Brother Juan Alvarez, of Toledo, of the family of the Dukes of Alva, and Brother Domingo, of Soto, an eminent *savant*.

The style of its architecture is that found in parts of the cathedrals of Seville and Segovia, that is, the last and decaying period of pointed architecture, with the decorations in the style called by the Spaniards the Plateresco, or that of the silversmith.

The bas-relief above the doorway, representing the Martyrdom of St. Stephen, is the work of the Milanese architect, Ceroni; the other sculptures of the façade were executed by a Spanish artist, Alonzo Sardina. The monastery occupies an area of 2,142 square mètres. It was the monks who formerly occupied this building who took under their care the projects of Christopher Columbus. Its history, indeed, is intimately mixed up with that of the discovery of America, Columbus having been lodged and maintained there during the whole time of his stay in Salamanca.

PROFESSIONAL MEN IN THE WITNESS-BOX.

A case has lately been heard, in which an order for the demolition of unhealthy houses was successfully maintained by the Chiswick Improvement Commissioners, and in which several points of general interest arise. Dr. Dudfield, of Kensington, amongst others, had deposed that demolition was the only remedy for their evil state. Dr. Collyer, the medical officer for Hammersmith, on the contrary, in giving evidence against the order for demolition, stated that in his district there were many similiar buildings, and that he considered them fit for habitation. Surveyors on both sides were also heard. As the Court affirmed the order, and expressed the opinion that the Commissioners were "amply justified" in the steps they had taken, the question, What about the "many similar buildings" in Hammersmith? naturally arises. We hope that the Board of Works of that district will require their medical officer to report on these buildings, and to give his reasons for not having them demolished also.

After hearing the professional evidence on each side, the Court arranged for one of their number to view the premises, presumably for the purpose of having an independent opinion on the question. This action shows the value that judges set upon professional evidence. It is a matter of common observation that as many professional witnesses can be obtained on one side of a case as on the other. We would not say that the fact of being engaged on a particular side of a case influences professional men in their opinion about it. But it is very remarkable, to say the least, that solicitors should be able to know the exact men who can unhesitatingly take their side in a case. The position of the legal profession differs from that of the other professions in this matter. A solicitor or counsel may believe that his client is a scamp, or that the case is a bad one, but that does not weaken his influence, as he does not give any testimony whatever in it. He simply undertakes to do the best he can for him. Other professional men, however, give their opinions as to the facts of the matter, and swear that a given thing is, or is not, good or bad, as the case may be. Until professional men take up a more independent position in the witness-box they may expect to have these practical comments on the value of their evidence made by judges.

Fever at Bangor.—The outbreak of typhoid fever which has for the last four months raged in Bangor and the district presents no sign of abatement, fresh cases being reported almost daily. The officer of health has for the second time condemned the filter beds at the reservoir, which, he says, are infected with germs of typhoid, and recommends that the water should be allowed to pass direct from the river, pending a proposal to take it from Ogwen, or one of the large river lakes.

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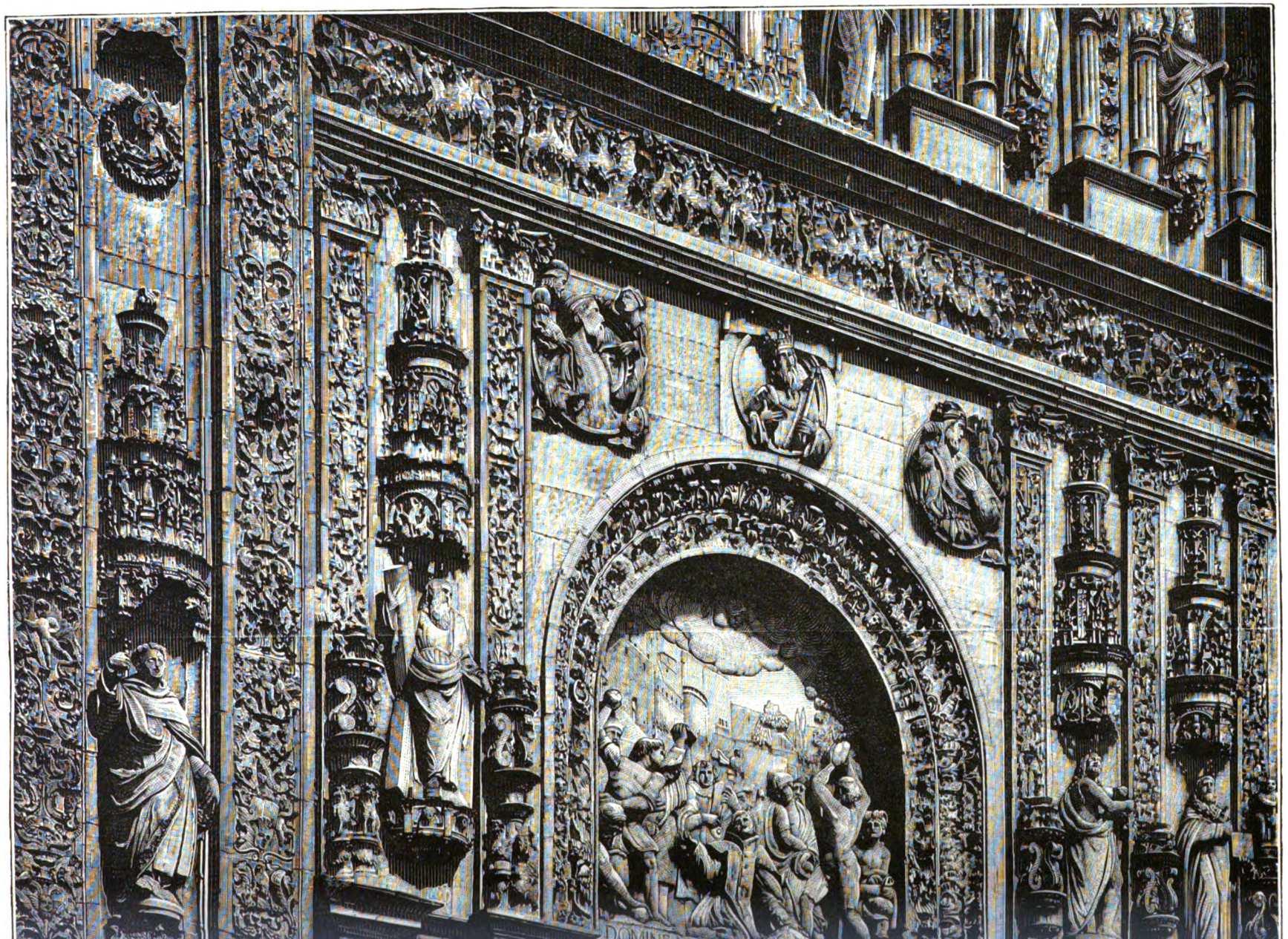

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PORTAL OF THE OLD CONVENT OF ST. DOMINGO, IN SALAMANCA, SPAIN.——JUAN DE ALAVA, ARCHITECT.

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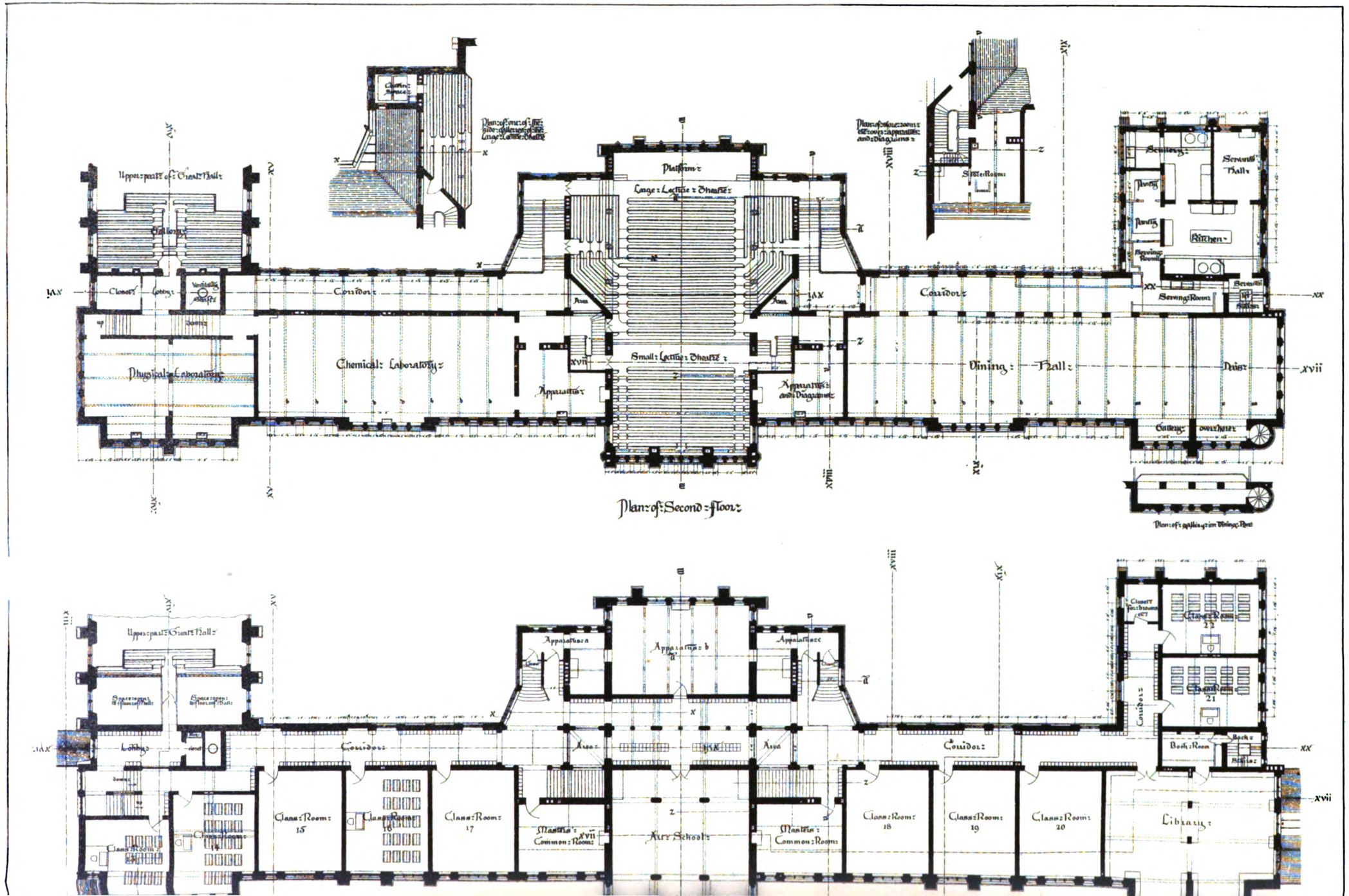

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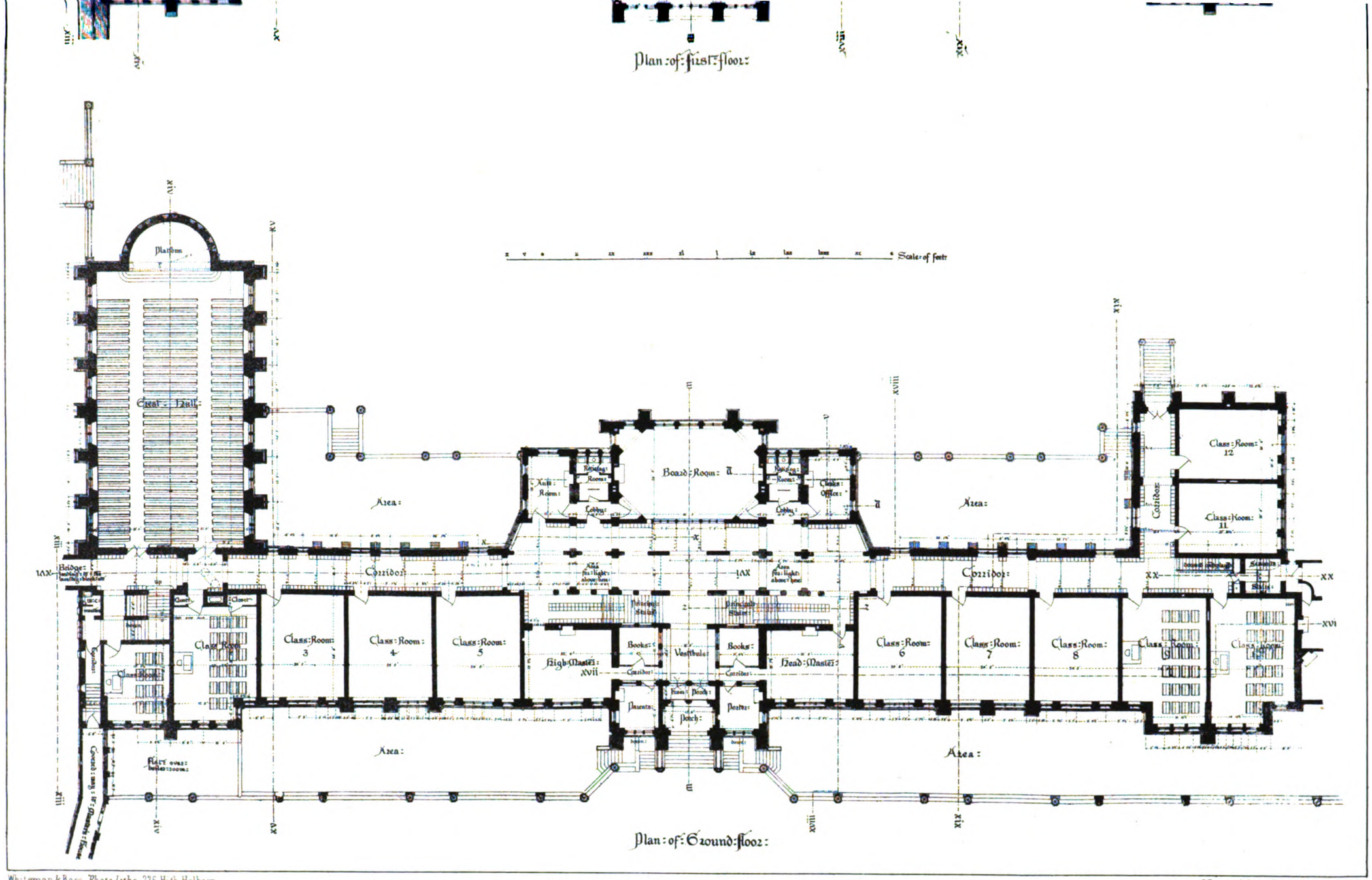

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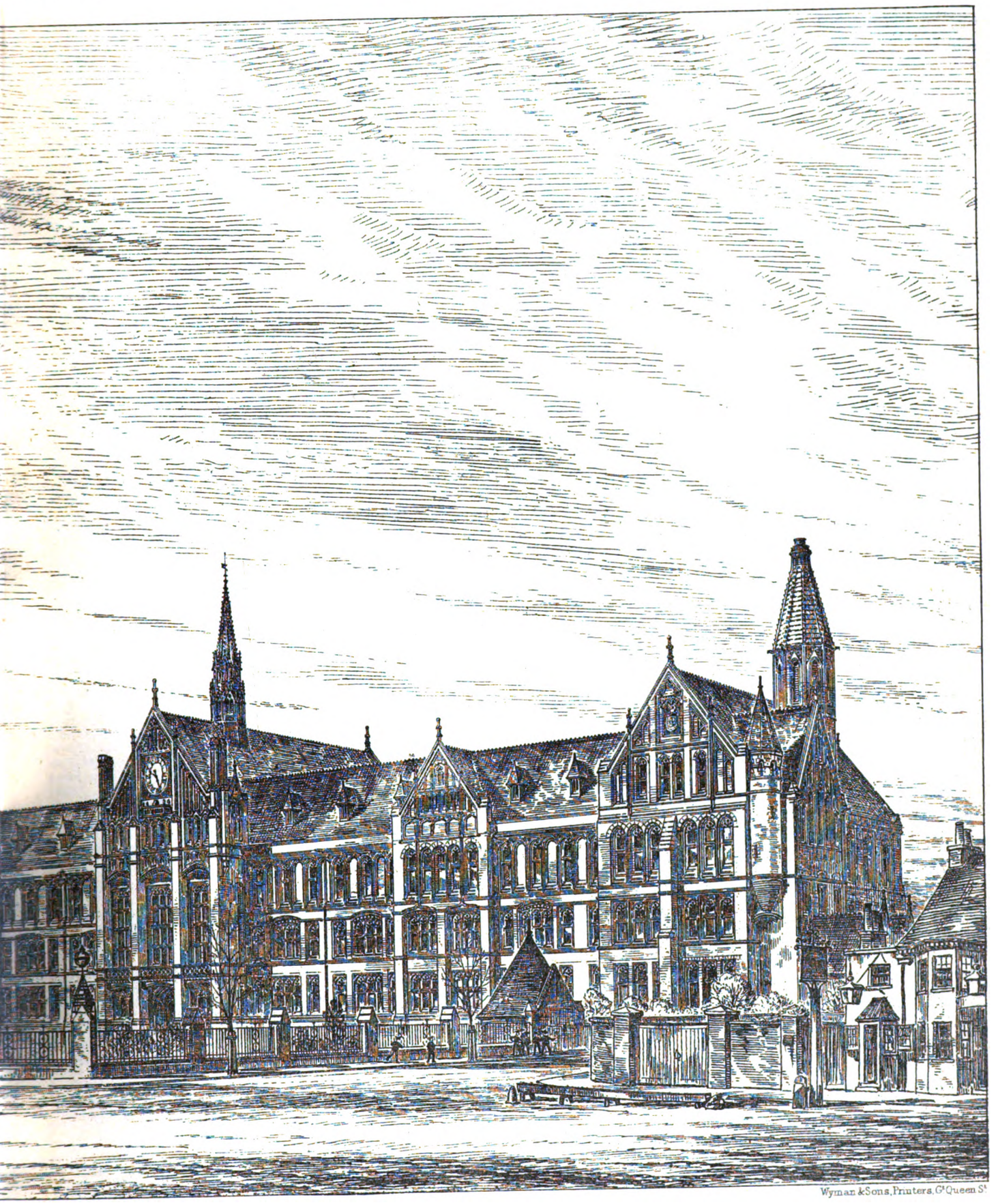

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—MR. WATERHOUSE, A.R.A., ARCHITECT.

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ST. PAUL'S SCHOOL, KENSINGTON.

This important building, of which we publish illustrations, occupies a site on the south side of the Hammersmith-road, bounded on the east by Edith-road, and on the west by Red Cow-lane; and is in the midst of a neighbourhood now being rapidly improved, and of which, in time to come, it will, no doubt, be the chief ornament.

Mr. Alfred Waterhouse, A.R.A., is the architect.

As will be seen from the plan, the class-rooms stretch right and left from the central block, which consists of the main entrance and board-room on the ground-floor; on the first floor, the art school, &c.; and on the second floor, the large and small theatres. These have been so arranged that the partition between them may upon short notice be readily removed and display one grand theatre, 88 ft. long and 40 ft. wide, with lateral extensions at its south end, which make it then 64 ft. wide.

The great hall, where all the scholars can be assembled at any time, and which is provided with a gallery for friends, stands at the south-east angle of the building,—a noble apartment, 80 ft. long, and 50 ft. to the panelled ceiling, having in addition at its south end a semicircular apse, in which is placed the platform.

Of the other important rooms, the library is placed at the north end of the west wing, and is 50 ft. by 36 ft.

The dining-hall, 125 ft. long, and which, with its corridor, divided from it only by an open arcade, is 41 ft. wide, occupies nearly the whole of the west flank of the building. The west end of this room is provided with a raised daïs and a gallery at one side, to which access is obtained by means of a small turret staircase. Upon this floor also the whole of the eastern flank is occupied by the physical and chemical laboratories.

Connected with the school building by a long cloister stands the master's house, with its offices and porter's lodge.

The sanitary offices of the school are kept separate from the main building; they lie to the east of it, and are connected with it by a bridge which spans the roadway from the Hammersmith-road to the cricket-ground. A little to the south of these offices fives-courts have been erected. Both the Eton and Harrow patterns have been adopted. On the south side of the school is the cricket-ground, which will be one of the finest in the metropolis. The structure is built of red brick and red terra-cotta, and the roofs are covered with brindled tiles. Walker's granolithic steps and landings are extensively used throughout the work. The contractors for the whole work are Messrs. J. Parnell & Son, of Rugby, Messrs. Doulton & Co. supplying the terra-cotta.

DURBAN TOWN HALL, NATAL.

At a meeting of the Corporation of Durban, Natal, held on July 6th, the first premium (100*l.*) was awarded to the set of drawings marked "? ? ?" by Mr. N. M. Dudgeon, of Durban, and the second of 50*l.* to the drawings marked "Nemo," which are by Mr. Samuel Musgrave, A.R.I.B.A., of Trinity House Lane, Hull. "? ? ?" is in the Classic style, and found favour with the local press before the selection was made. The arrangement of the plan was thought second to none, and far superior to most of the other designs.

The design marked "Nemo" was also pointed to as one likely to be selected. The only objection raised was that it was "a little too churchy."

Science and Art Department.—The following candidates have been successful in obtaining Royal Exhibitions of 50*l.* per annum each for three years, and free admission to the course of instruction at the following Institutions:—1. The Normal School of Science and Royal School of Mines, South Kensington and Jermyn-street, London: Christopher J. Whittaker (22), engineer, Accrington; George Gibbens (19), student, Leytonstone; Isaac T. Walls (22), painter, Accrington; John H. Tomlinson (20), apprentice, Newcastle-on-Tyne. 2. The Royal College of Science, Dublin: Arthur Adams (23), engineer, Birmingham; Abraham Firth (21), assistant teacher, Stockport; Sidney A. Sworn (16), student, Southampton.

THE BRITISH ARCHÆOLOGICAL ASSOCIATION AT PLYMOUTH.

The thirty-ninth annual meeting of the British Archæological Association commenced at Plymouth on Monday. The Association has never before met in Plymouth, but in 1876 it had a very pleasant meeting in Cornwall, under the presidency of the Earl of Mount-Edgcumbe. The present congress commenced with the reception of the members of the Association by the Mayor (Mr. C. F. Burnard) and Corporation in the Council-chamber. Complimentary speeches were then made. The Mayor, in a hearty speech, welcomed the Association to Plymouth, and Mr. Thomas Morgan, F.S.A., hon. treasurer, and Mr. George R. Wright, the congress secretary, returned thanks on behalf of the members. After these proceedings, the members inspected the Corporation insignia and plate, upon which Mr. Lambert and Mr. R. N. Worth offered some observations. Mr. Worth then read an interesting paper on the Borough Records,—a very valuable series,—which mainly owe their preservation to the painstaking labours of the late Mr. Henry Woollcombe, F.S.A., formerly Recorder of Plymouth.

After partaking of luncheon, the visitors proceeded to view some of the churches, old buildings, and other antiquities in the town, beginning with St. Andrew's Church. Mr. Worth briefly recounted the chief points in the history of the church, a building which Mr. Loftus Brock spoke of as one of the finest illustrations extant of Devonshire Perpendicular. The "Abbey," so called, was then inspected from the churchyard, and Mr. Worth stated that he had been fortunate enough recently to obtain very good evidence that it was not an abbey at all, but the old "prysten" or clergy-house of the town. Charles Church was the next place of rendezvous, and here Mr. Brock spoke very highly of the design of the unknown architect. Post-Reformation Gothic churches were very rare, and this was one of the finest in the kingdom. It was very evident that in some respects the designer had followed St. Andrew's; but for the very beautiful great east and west windows he had clearly gone to the cathedral at Exeter. If the very wonderful galleries and high pews were swept away the real beauty and adaptability of the building would be recognised. The next point of interest was the old Dominican monastery in Southside-street, now and long occupied by Messrs. Coates & Co. as a distillery. On the way thither Mr. Worth called a halt at the head of Buckwell-street, and stated that he had an interesting statement to make. Hitherto all efforts to discover the exact locality of Sir Francis Drake's residence in Plymouth had failed, but within the past few weeks it had been his good fortune to obtain evidence from deeds of Drake's occupancy, prior to Buckland Abbey, of a house and garden at the corner of Looe and Buckwell streets.

The Duke of Somerset, who was announced as the president of the congress, was, unfortunately, not able to take any practical part in the gathering. It was hoped that his Grace would write an address for some one else to read, but even this his health would not permit him to do. His place was taken by Sir James Picton, who, in the course of an inaugural address delivered in the evening, said,—We are justly proud of our English institutions, with their roots firmly fixed in the past, and their vigorous branches stretching forward into the unknown future. But history does not consist entirely of written documents, however valuable their contents may be. The surface of our country is studded with historical records, written in the stone and brick and earth works which bridge over the period between the ages before the dawn of written history, and connect them without a break with the living present. Written history without these, however eloquent, would be comparatively tame, spiritless, and uninteresting. There are thousands of objects all over our country which have special associations with the past, or, at all events, form links in the chain which binds the remotest ages with the present. Going further back, the Roman remains give evidence supplementary to written history. The mining operations of the Romans, of which such extensive *débris* remain; the splendid roads which traversed the country in all directions, many of which are still in use; the great wall and stations of Hadrian, all manifest the application of engineering skill and capital which could only have existed under a settled and wisely-administered Government. Further back still we come to the twilight of English history, which is ultimately lost in darkness. Here written evidence fails us; but we are not without a clue to guide us through the labyrinth to certain definite conclusions. The cromlechs, the stone circles, the dolmens, the barrows, the grave-mounds, the pit dwellings, the primitive fortifications, supply in themselves no certain indications of the date of their construction, but they afford very strong evidence of the state of society, and the manners of those who erected them. Further back still we are introduced into the habitations of the cave-dwellers, where man struggled for supremacy with the cave lion and the bear, and used the primitive weapons of bone and flint for the capture of the fish and deer on which he subsisted. Again we go back until we reach the drift period, where we have the earliest intimation of human life in its incipient stage of feeble progression. Now, reasoning from analogy and comparison, we are able to draw certain conclusions from what we here find, and to present, with tolerable accuracy, a picture of the forefathers of our race in their earliest development. These earlier stages belong more properly to what is called palæontology, but it is difficult to draw the line where archæology ends and palæontology begins. As investigation goes forward the two will of necessity blend together and form a single department of inquiry. A very cursory glance will show that there is ample scope and verge enough for a union of effort devoted to one common end,—the examination and elucidation of our relics of antiquity of all ages and of every description. This is the origin and the *raison d'être* of the British Archæological Association. I have given the reasons for its existence, and indicated the scope of its inquiries. I wish now to say a few words on the objects it has in view and the means of carrying them out. Its main purpose is to call attention to the precious relics of antiquity which remain amongst us, to facilitate their inspection and examination, to inquire into and illustrate their history where practicable, or otherwise to deduce from their own internal evidence the conclusions to which they lead, to encourage an intelligent study of our antiquities and of the art and science displayed in their construction, to place on record the results of the annual meetings and visits in the various localities, and last, but not least, to engage public sympathy in the guardianship and preservation from injury of these precious remains. Now, many valuable objects, especially of the pre-historic character, have been and still are consigned to destruction through simple ignorance of their value. Much may be done by keeping the public alive to the importance of preserving our national monuments. This leads to another vexed question, which has raised considerable discussion. I mean the so-called restoration of our ancient buildings, especially churches. The revival of Mediæval architecture within the last fifty years, concurrently with what is called the Oxford ecclesiastical movement, drew attention, especially amongst the clergy, to the neglected and dilapidated state of our churches in some instances, and in others to their degradation and disfigurement by the interpolation of galleries, box-pews, and re-buildings in an altogether unworthy style. Considerable zeal was manifested in improving this state of things by removing the excrescences, and endeavouring to restore the buildings to their original condition. Zeal, however, is not always accompanied by sufficient knowledge and wisdom, and hence it has too frequently happened that the restoration has resulted in an error of the opposite kind, and in the attempt to reproduce a specimen of pure Mediæval architecture all the flavour of antiquity has been done away, and the residuum has become a raw, cold, staring building, reminding us rather of the modern contractor than of the hoary freemason of old. . . . . Much mischief has been done, but there are still many fine buildings which have hitherto escaped the ravages of the restorer. It is to be hoped that all who have a true reverence for antiquity will lend their aid to prevent all needless desecration. The true principle of restoration is this,—Where an unsightly excrescence has been introduced, remove it; where a stone is decayed, replace it; where the walls are covered with whitewash, clean them down. If tracery is broken, match it with new of similar character, but spare the antique surface. Do not touch

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the evidence which time has recorded of the days gone by. I say nothing of buildings in ruins or in danger, which of course must be rebuilt in the style best suited to the purpose.

On Tuesday morning the members proceeded by special train to Horrabridge, whence they proceeded in carriages to Buckland Abbey, upon which Mr. Brock read a paper. He observed that it was seldom that the members of the British Archæological Association had had the advantage of inspecting the remains of so varied a number of the houses of the religious orders, once so numerous in our land, as during the present congress. At Tavistock they would see the remains of the older order of Benedictines; Plympton was for Austin Canons, and at Tor Abbey they would see the site of a Premonstratensian House, one of the so-called Reformed Orders, placed away from the haunts of men. The site of Buckland, a low valley beside the stream, was clearly that of an abbey of Cistercians. Buckland Abbey, Mr. Brock went on to to say, was founded by Amicia, the wife of William, Earl of Albemarle, and she signed the foundation-deed in 1280. Of the history of the monastery there was little to add beyond that it was founded and dissolved. It was a curious fact in relation to the churches of the Cistercian order that hardly one was now used for divine service. This was no doubt owing to the fact that the sites were away from the population, and, in most instances, the churches were demolished for the sake of the materials. Here, at Buckland, we had a curious and unusual example of its retention. Here the church was kept standing, and was converted into a dwelling. It consisted of a spacious nave, which had no aisle, and never had any; a low central tower, which was still intact, and a single transept. The original arrangements of the church were, in fact, as anomalous as its present appropriation, and showed that the establishments of the Cistercians were not always set on the same unvarying plan, as some believed. The church appeared to have been adapted to its present use as a dwelling-house in the time of Queen Elizabeth, and there were many objects of interest of that date remaining in it. Apart from the well-known portrait of Sir Francis Drake, who lived there for many years, and whose descendants still owned it, there was a curious chimney-piece with his arms on it in the tower.

The visitors next drove to the interesting and picturesque village of Buckland Monachorum, almost every house of which, as Sir James Picton pointed out, contains some traces of the hand of the Mediæval builder. The church was the central point of interest; and in it Mr. Brock made some interesting remarks. He said it was a very charming fifteenth-century church, somewhat different from the usual type of Devonshire church, and he was extremely glad to find it was kept in such beautiful order, and had been restored on such good principles, with respect to the preservation of the old work. The building differed from the ordinary type of Devonshire church in that it had both north and south transepts, and a chancel arch without the roof of the nave and chancel being continuous. The work, too, was of somewhat earlier date than most of the other local churches. The mouldings and traceries were deeper and cleaner than in the ordinary Devonshire church, and it was very interesting to notice how skilful were our ancestors in the use of granite. That hard, and, as we considered, unpractical material was here used, almost as we should use a Bath stone, while the ancient builders had here taken advantage of the great blocks in which it was found to work the pillars for the arcade in one stone, 10 ft. or 12 ft. in height. The roof of the Chantry Chapel, to which the Drake family had succeeded when they had obtained property in the parish, showed the marvellous way in which the granite had been worked. The eighteenth-century monument in this chapel, Mr. Brock said, was worth much more attention than such monuments usually deserved. It was a monument to Baron Heathfield, of Gibraltar renown, and was by the elder Bacon. On rejoining the carriages, the visitors proceeded to Princetown. The weather over the moors was very gloomy, and, just before Princetown was reached, a thick misty rain came down, and not only obscured the view, but made travelling otherwise disagreeable. Luncheon under the welcome cover of the Duchy Hotel rendered the party for the time perfectly oblivious to the weather; but subsequently, when thoughts were turned towards resuming the programme, matters took a less agreeable turn, and, after some delay and consultation, it was resolved to drive at once back to Tavistock, and catch an earlier train than that arranged for the return journey to Plymouth. A small party did, indeed, in the intervals, reach the Cyclopean Bridge at Blackabrook, under the guidance of Mr. C. W. Dymond, F.S.A., who had also undertaken to explain the prehistoric remains at Merivale Bridge, consisting of hut-circles, avenues, menhir, sacred circle, &c., but the weather did not permit.

In the evening there was a meeting in the Plymouth Athenæum, when the President of the Plymouth Institution (Mr. R. N. Worth) delivered a brief address on local antiquities and history. The chair was then taken by Mr. Morgan, and the following papers were read, viz.:—"Glimpses of Municipal Life in the Olden Times," by Sir James Picton; "Drake and his Voyage of Circumnavigation," by the Rev. W. S. Lach-Szyrma; and on "The Name and Arms of Drake," by Dr. Drake.

The members spent the whole of Wednesday in making excursions. In the morning they went to Totnes, whence they at once proceeded down the River Dart upon a river steamer. At Dartmouth they visited the Church of St. Saviour, subsequently returning to Totnes, where they found a great deal to interest them.

FIREPROOF PAINTS.

The catastrophe at Vienna gave a great impetus to the inquiry for fireproof paints. It contributed somewhat to our knowledge of the materials that may be used for coating objects so as to render them almost incombustible. To make that acquaintance more general, it will not be out of place to enumerate the various means that have from time to time been recommended for rendering objects fireproof. Such means have been known for a long time; unfortunately their use has hitherto been more or less neglected, and it is only now that their usefulness is receiving due recognition. Thus, soluble glass has been known for a long time as a safe covering, but the instances in which it has been applied are very rare indeed, although its action is remarkable. In one case an experimenter demonstrated the protective properties of soluble glass by leaving a wooden stirrer saturated with it in the intense heat of a coke-oven, without its taking fire. It was charred only after it had remained there for some time. Of course, wood covered with such paint, and its pores well penetrated by it, will ultimately burn; but it is ignited only with the greatest difficulty, and the fire spreads so slowly as to render a large conflagration impossible. It is very advisable to mix soluble glass with whitening, which mixture turns after a time into an insoluble combination. In order to cause the paint to penetrate the wood, it is best to warm it well before application. Soluble glass is not to be recommended for dress materials or woven stuffs generally; it makes them too stiff, and also spoils the colour. Its use would be best limited to wood, stiff linen, scenery in theatres, &c.

The following application is also recommended for wood. One part of perfectly sound English Roman cement, two parts of washed scouring sand, one part of fresh cheese (curds), and three-quarter part of butter-milk are well mixed, and the wood coated twice with the mixture. While applying it, the mixture must be well stirred, to prevent the sand settling at the bottom of the vessel. The first coat must be allowed to dry,—which would not take long in summer,—before the second is put on. Surfaces to be thus coated had better be left rough and unplaned, which gives them the appearance of stone. In order to insure durability, woodwork in a horizontal position receives three coatings of varnish mixed with green earth; for slanting surfaces, two coats are sufficient; for vertical surfaces one coat suffices. For smooth surfaces, two parts of the above cement, one part of fresh cheese, and a quarter part of butter-milk are taken. But only so much must be prepared of these mixtures as is used up at once.

If 100 parts by weight of alum are dissolved in 800 parts of boiling water, and twenty-five parts of English sulphuric acid are added to the solution when cold, an excellent fireproof grounding is obtained, which, if the respective parts are so many kilogrammes, costs about 24s., and must be applied to the wood twice. To prevent the alum being destroyed by the moisture of the atmosphere, the following coating is recommended. Ten litres of lime powder and ten litres of fresh but poor cheese are worked well with about three litres of water with a wooden shovel, ten litres of sand and as much water being added during mixing as is required to convert the whole into a stiffish mass. It is advisable to strain this mass through a medium sieve before use. Mineral or metallic colour may be added.

Potash solved to saturation in water is also a protective covering for wood. After this coating has been applied, the wood receives three or four applications of a mass prepared of one part by weight of potash, twenty parts of yellow clay, and 1½ part of flour, and mixed with water to the consistency of ordinary size-colour. A fireproof coating may also be obtained by mixing twenty-four parts of slaked lime, one part of fat blubber, one part of powdered gypsum, two parts of fine sand, four parts of brick-dust, three parts of hammer-slag, and four parts of chopped calf's hair, with enough bullock's blood to produce a good combination of the several materials. A mixture of lime and alum is likewise said to give a good fireproof covering to wood, which must be well saturated with it; also a mass consisting of twenty-five parts of borax, twenty-five parts of Epsom salts, and 100 parts of water; further, a mixture of three parts of slaked lime, two parts of screened wood-ashes, and one part of fine sand, rubbed with linseed oil to a paint readily applied. Another fireproof covering consists of 66·6 parts of gypsum, 33·3 parts of sulphate of ammonia, and 100 parts of water.

For effectually rendering woven fabrics fireproof, tungstate of soda, which comes into the market in the form of white needles, takes the first place. When it is desired to use it for impregnating dresses, covers, curtains, &c., it is dissolved in five times its quantity of water, and a small quantity of phosphate of soda is added. The material, after being completely saturated with it, is wrung out, and dried in a moderately warmed room. If this substance is used, the materials impregnated with it are not only protected against fire,—they carbonise but slowly,—but they preserve their natural suppleness and elasticity. Unfortunately, this substance is too dear to find general application. The mixture, above mentioned, of borax and Epsom salts might, however, take its place, and is considerably cheaper. Both possess the valuable property that they do not destroy even the finest threads; but those colours which water damages are injured likewise by them. For tissues, in using the two last-mentioned substances, the following is a good proportion for mixing. Shortly before use, two and a quarter parts by weight of Epsom salts and three parts of borax are dissolved in twenty parts of water. The latter must be warm, and the whole is stirred with a wooden stick until the salts are completely dissolved. Impregnation is effected in the same way as in the case of tungstate of soda; only it is advisable, instead of wringing out the immersed materials, to mangle them between two cloths in an ordinary mangle. If the stuffs are to be ironed out at once, and it is desired to give them the requisite stiffness, the necessary quantity of starch is at once added to the warm solution.

Paper and woven stuffs may also be treated with a solution of three parts of phosphate of ammonia, two parts of sal ammoniac, one part of sulphate of ammonia, and a little chloride of calcium in forty to fifty parts of water. If starch is mixed with it at the same time, no more water is required, not even for damping down. The stuffs become somewhat harder, but the change is unimportant. A combination of gypsum and sulphate of ammonia, mixed in varying proportions of quantity, according as the material to be impregnated is coarse or fine, is said to be also a capital protection against fire, which has, besides, the advantage of cheapness. Vanadiates, on the contrary, are dear, but they may be recommended because they do not injure either the colours of the tissues to which they are applied or deposit white crusts on the surface.

There is no need to further extend this list, which includes some very valuable means for arresting the spread of fire. They have all been tested more or less by experts, and found efficient. In the immediate vicinity of a flame materials impregnated with them may take fire, but they merely get charred, and burn but slowly. Some of the above means have

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been tried in this country, but not any of them have, to our knowledge, been extensively applied. It appears to us, therefore, desirable that the lessons conveyed by the recent trials with asbestos paint should be noted. The preparation of that paint has been described before; but it may be as well to state, briefly, once more that the substance known as Italian asbestos is mixed in a finely-divided state with the other ingredients which make up the paint to be used. It has been repeatedly stated, and practically demonstrated, that paint thus prepared renders the objects to which it is applied as a protective covering perfectly fireproof. All who witnessed the latest experiment on the Thames Embankment, a few weeks ago, must have come away with the impression that a substance has been found which will resist fire long enough for all necessary measures for the saving of human lives to be taken before the flames become uncontrollable.

THE STRENGTH OF QUARRY STONES.

In our issue of July 22nd* we called attention to a theory which had been propounded by Herr Müller, of Magdeburg, according to which the strength of quarry stones is in direct proportion to their specific gravity.

A detailed criticism of Herr Müller's statements has since appeared, in which Dr. Böhme, of Berlin, takes up the position that the principles on which this theory rests are erroneous. He denies that any fixed rule can be applied to the settlement of the question at issue, in view of the differences which are known to exist in the various particles of which quarry stones are composed, and also in view of the varied character of the influences to which these stones have been subject in the process of their formation. With a compression spreading over a long period, and gradually increasing in power, greater strength must, he considers, be attained than by the action of a sudden and violent force, the molecules having an opportunity in the former case of becoming thoroughly knit together.

The results of the experiments made by Dr. Böhme may be summarised as follows (the strength being shown in pounds per square inch):—

(*a*) Limestone with a specific gravity of 2·68:—

	5 wet samples.	5 dry samples.
Lowest strength	7154·16	7267·95
Highest strength	9984·54	10581·91

(*b*) Limestone with a specific gravity of 2·70:—

	11 wet samples.	11 dry samples.
Lowest strength	8050·22	8050·22
Highest strength	10738·36	12515·80

(*c*) Limestone with a specific gravity of 2·71:—

	6 wet samples.	6 dry samples.
Lowest strength	7196·83	7879·54
Highest strength	12316·72	13668·60

(*d*) Limestone with a specific gravity of 2·72:—

	5 wet samples.	5 dry samples.
Lowest strength	9073·27	9600·50
Highest strength	15033·71	14934·15

(*e*) Sandstone with a specific gravity of 2·54:—

	Wet samples.	Dry samples.
No. 1	12487·40	13668·60
No. 2	15488·80	14607·02

(*f*) Sandstone with a specific gravity of 2·56:—

	Wet samples.	Dry samples.
No. 1	10169·44	9700·10
No. 2	18518·24	18902·37

(*g*) Sandstone with a specific gravity of 2·59:—

	Wet samples.	Dry samples.
No. 1	8932·04	9700·10
No. 2	11051·27	11349·56
No. 3	17224·45	16754·40

From these results Dr. Böhme argues that it is impossible to assume that exact connexion between specific gravity and strength which Herr Müller claims to have established. Quarry stones are, he remarks, masses of a very heterogeneous character. Their specific gravity is produced by the substances of which they are composed, which are of different specific gravities, while the proportion in which each component substance exists in the bulk, is also liable to fluctuations of a more or less important character. He maintains that the strength of the stones principally depends upon the manner in which these various component parts are united. In the detailed consideration of this branch of the subject, the various influences to which the stones have been exposed, are elements of primary importance.

It is remarked that in porous and relatively light descriptions of limestone, the close union of the component particles is sometimes productive of a greater resisting power than is found in other descriptions where great strength might be looked for, but which have been formed with relative quickness, and, therefore, under circumstances unfavourable to their qualities of resistance.

Comparison between stones of Plutonic, and those of Neptunian origin, is not possible, according to Dr. Böhme, who points out the fact that porous hard lava, which is considerably lighter than sedimentary limestone and sandstone, is usually possessed of greater resisting power than either of these varieties.

Being, for the most part, a criticism on Herr Müller's theory, there are several points in Dr. Böhme's remarks which invite further debate, and doubtless the attention which has been thus drawn to the subject in German technical circles will lead to its eventual discussion in a complete form. The important divergence in the results of the two series of experiments on limestone would almost seem to point to some differences in the substances experimented upon or in the application of the tests. In the limestone experiments, the principle of a simultaneous increase of specific gravity and strength would not seem to be exactly controverted, but Dr. Böhme's arguments are, to some extent, borne out by the figures quoted in connexion with his tests of sandstone. Doubtless his main intention has been to show the futility of any attempts to arrive at reliable data on the subject, and in this object he seems to have been more or less successful.

* See p. 107, *ante*.

THE HARRIS FREE PUBLIC LIBRARY AND MUSEUM.

The plans for the Harris Free Library and Museum at Preston, the foundation-stone of which is to be laid by the Duke of Albany during his visit to Preston in the Guild Week, commencing on the 4th of September,—have been on view in the council chamber at the town-hall during the last few days. The designs have been prepared by Mr. James Hibbert, who was commissioned by the Harris Trustees to visit several buildings of a similar character in this country and on the Continent, the result of Mr. Hibbert's visit and report being that he was appointed the architect to prepare the designs.

The building will be of the Greek Ionic order, and will have four distinct frontages, being completely isolated from the buildings around it. The principal elevation is on the west side, overlooking the market-place, and almost at right-angles with the north frontage of the town-hall. The height of the frontage to the parapet and the apex of the portico is 80 ft., and the extreme height to the top of a central lantern, 112 ft. The portico consists of six massive fluted columns, with bold capitals. It is surmounted by a bold overhanging cornice, and the tympanum is filled in with a group of figures representing Minerva surrounded by literature, science, and the arts. The frontage is 130 ft. The bases of the columns of the portico, and its floor level, are about 10 ft. above the street level, and the entrance to the building is under the portico by flights of steps on the north and south sides. Immediately under the tympanum of the portico is the carved inscription in large characters, "To Literature, Science, and Art." The eastern elevation of the building faces Lancaster-road, a fine thoroughfare, about 60 ft. in width, leading out of Church-street, the principal street in the town. It is uniform in length with the Market-place frontage. The north and south frontages are each 170 ft. in length and will face two new streets, each 50 ft. in width, which are about to be constructed in connexion with certain town improvements intended to be carried out simultaneously with the erection of the Free Library buildings. The design of the principal elevation is maintained in the three last-named frontages, ornamental columns being carried along the face of the several elevations. The building will cover a ground-area of about 25,000 ft.

The building will contain three floors above the street level, in addition to the basement. The ground-floor portion will contain the lending libraries, patents library, reading-room, newsroom, workroom for the collection of models connected with the industrial arts, the museum, curator's workroom, and the entrance staircase and central hall. The collection of models connected with the industrial arts will be placed on the ground-floor portion of the central hall, with the object of bringing them under the daily observation of visitors passing to and from the lending department and the adjacent reading-room and news-room. The newsroom on the south side, and the reading-room on the north side, are each 29 ft. by 55 ft.; one of the lending libraries is 50 ft. square, and the other 55 ft. by 29 ft. The central hall is 54 ft. square, and is continued, by the staircase, on all the floors, being lighted by the lantern immediately over a central well. The principal floor contains the reference libraries, on each side of the central hall. They are each 30 ft. in width, and 120 ft. in length. The central hall portion of the principal floor will be set apart as a museum of casts and reproductions from the antique. On the principal floor there is also a conversation-room, and a room for chess and draughts. The whole of the upper floor will be devoted to museum and fine-art purposes. The museum galleries are arranged round three sides of the central hall and staircase; one side being devoted to the fine arts, the corresponding side to natural history and physics, and the remaining side between these to the department of general archæology, ceramic, and the finer kinds of industrial art, and illustrations of ethnology. The east end of the central hall portion of this floor, 55 ft. by 29 ft., will be devoted to general antiquities, coins, and gems. Specimens of sculpture after the antique and later schools are intended to form a feature in the institution, and these will be for the most part placed in the staircase and central hall. The basement floor will contain the heating apparatus, storage-room, libraries workroom, and museums storage-room.

The arrangement of bookcases shown on the plans provides for shelving 89,825 volumes, of which 30,350 volumes are proposed for the lending library, 5,000 volumes for the library of patents, and the remaining portions for the reference libraries.

The estimated cost of the building itself is 70,000*l.*, and the cost of the site 25,000*l.*, which is provided by the Corporation. The total cost of the building and site will thus be about 95,000*l.* The Harris trustees contribute in the aggregate 90,000*l.*, viz., 70,000*l.* for the cost of the building, 5,000*l.* for the purchase of books for the Harris Reference Library, 5,000*l.* to be expended in purchasing examples of the fine and industrial arts; and they further place a sum of 10,000*l.* with the Corporation, on interest at 4 per cent., to be expended annually in additions to the reference library, museum, and art galleries.

PROPOSED NEW GRAND LODGE FOR ENGLISH FREEMASONS.

Owing to the vast increase of brethren in Freemasonry during the time that H.R.H. the Prince of Wales has occupied the chair of Most Worshipful Grand Master, a suggestion has been made to acquire the site of the National Opera-house on the Thames-embankment, for the purposes of erecting a temple suitable for the accommodation, and worthy of such an important body, as that of Freemasonry in England.

The site, so magnificently placed, and owing to its proximity to so many railway stations, the Clubs, and the Houses of Parliament, would prove most convenient for the brethren.

The suggestion was made by Mr. Matt. Wyatt and Mr. T. S. Archer, by whom designs have been prepared, and which are now being submitted to some of the influential brethren in the Craft.

Fulham Infirmary.—In our report last week in reference to the appointment of a quantity surveyor, it was stated that Messrs. Maughan & Cuxson had offered to do the work for half per cent. We are requested to state that they were one of the firms who did not name any rate in their application.

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THE HISTORY OF ENGINEERING IN LEEDS.

This was the title of a paper read by Mr. A. H. Meysey-Thompson, before the annual meeting of the Institution of Mechanical Engineers, held in Leeds last week. In the course of the paper the writer said: — Mechanical engineering appears to have made but little progress prior to the commencement of the present century. The necessary machinery for the various mills in the district, whether driven by wind or water power, was of a very simple character; and the appliances for colliery working, or for the smelting and working of iron, were of a very primitive description. It was about a hundred years ago that improvements in the steam-engine gave an impetus to mechanical engineering throughout the country; and the genius of Matthew Murray soon enabled the Leeds district to take a prominent place in this industry. Murray commenced his career in Leeds at a flax-mill of John Marshall, about the year 1789, at a time when the manufacture of flax by machinery was just commencing; and by the improvements which he introduced into the machinery he gave to the flax trade of the district a start which it has never lost. Perhaps his most important inventions in this class of machinery were the hackling-machine (which procured him the prize of the gold medal of the Society of Arts), and his machine for wet flax spinning by means of sponge weights, which proved of the greatest practical value. Murray continued in Messrs. Marshall's service up to the year 1795, when, realising the great want that existed for trained mechanics and organised works for the better manufacture of improved flax machinery, he secured the co-operation of Fenton & Wood, and started,—in the works known as the Round Foundry, and now in the occupation of Messrs. Smith, Beacock, & Tannett,—the well-known firm of Fenton, Murray, & Wood, afterwards Fenton, Murray, & Jackson. Not only did Murray manufacture flax-machines, but he also turned his attention to engines for driving them; and so successful were the latter, that engine-building soon became a large branch of his manufacture. Two engines of his make, one of fifty horse-power, the other of sixteen horse-power, are still driving machinery at Messrs. Titley, Tatham, & Walker's, Water Hall Mills, Holbeck. For one of his engines, sent to Russia, he received a gold medal from the Emperor. Whether this medal was the only payment received for the engine, history does not state. At the commencement of the present century all the engines for flax-spinning were of the beam type. The long D slide-valve, usually employed in those engines, was, according to Smiles, either invented or greatly improved by Murray; and it was probably owing to the difficulty experienced in getting the two surfaces of the valve perfectly true to one another that he was led, if not to the invention, at all events to the development, of the planing-machine. So rapidly did his business progress in the north of England that James Watt found him a formidable rival,—so formidable, indeed, that the firm of Boulton & Watt bought up the land round his works to prevent their extension. In 1812, in conjunction with Blenkinsop, Murray brought out what was undoubtedly the first locomotive engine ever successfully employed for commercial purposes. It was constructed for the conveyance of coal from the Middleton Colliery to Leeds, a distance of about three miles and a half, and was capable of dragging thirty loaded coal-wagons at a speed of between three and four miles an hour. It continued to run for many years. Murray's works were the school in which numbers of engineers of note in the early part of the present century were educated, many of whom started works in Leeds and elsewhere. In the year 1826 mechanical engineering in Leeds comprised:—(1), textile machinery; (2), locomotives; (3), fixed engines, all of which were then made solely by the firm of Fenton, Murray, & Wood. As time went on, the large textile manufacturers began to require tools for the repairing of their machinery, and about the year 1837 the manufacture of such tools became a distinct branch of trade, two firms starting at that time solely for this purpose. The tools required for machine repairing were tools suitable for general engineering manufacture, such as lathes and planing-machines; and it is interesting to observe how little these two machines, which are still the leading tools of engineering shops, have been altered from their original forms. Between the years 1830 and 1840 the railway system had become established, and so rapid was its development that a large and increasing demand for locomotives quickly came into existence. In the year 1837 a steamer actually crossed the Atlantic, and shortly after a new manufacture, viz., that of the marine engine, was initiated. This revolution in the mode of transit by land and water created a new branch of the tool trade, owing to the fact that the manufacture of locomotive and marine engines required special machinery, of larger dimensions than had previously been used or found necessary for other purposes. The tool-makers in Leeds were not slow in meeting this fresh demand on their resources, and the tool trade rapidly grew, until about the year 1852, when it received a further impulse from the change at that time made in ship-building by the substitution of iron for wood. This new industry created a demand for still heavier tools, not only for the building of ships, but also indirectly for the preparation and manufacture of the iron in the ironworks. So rapid was the growth of this branch of manufacture that it is not surprising to find that by the year 1866 the tool trade of Leeds had grown to very large proportions, employing about 8,000 men. At the present time the trade is one of the most important industries of the town. . . . . The manufacture of cut nails has made most rapid strides of late years. Formerly nails were made in presses by manual power. In 1819 steam was first applied in Leeds to this manufacture by Messrs. Roberts, who cut a ton a week, which was then regarded as a large quantity. Since that time the machines have been wonderfully improved. A nail is now cut, headed, and pointed at one stroke; and by a recent improvement a self-acting feed is provided, thus further diminishing manual labour very considerably. In the year 1858 Mr. Kitson, in a paper read before the British Association, estimated the number of hands employed to be 188, of whom 100 were women; and the annual weight of nails made to be 3,452 tons. At the present time the annual make of nails is about 15,000 tons, employing nearly 600 hands, of whom about two-thirds are women. There are six works established for the manufacture of what is generally known as best Yorkshire iron, which is obtained from an ironstone in the lower coal measures, and commonly known as argillaceous carbonate. The total amount of this ore raised in 1881 was 320,981 tons, all of which was consumed by these six works. The excellence of the pig iron produced is also due partly to the fuel. What is known as "better-bed" coal is exclusively used for the coke employed in smelting, its remarkable freedom from sulphur making it especially suitable for smelting purposes. The superior quality of the manufactured iron is due not only to the purity of the pig, but also to the extreme care exercised in all stages of the manufacture; the fact of its commanding the highest price in the market being sufficient proof of its excellence.

LONDON AND MIDDLESEX ARCHÆOLOGICAL SOCIETY.

VISIT TO SILCHESTER.

On the 17th the members of the London and Middlesex Archæological Society, joined by representatives of the Berkshire Archæological Society and the Newbury District Field Club, made an excursion to Silchester. The major portion of the party travelled from Waterloo by South-Western Railway to Basingstoke, where a carriage was in waiting, and an agreeable drive brought them to The Vyne, the historical seat of the Chute family. After a short stay they resumed their journey to Silchester, where Mr. James Parker, of Oxford, gave a descriptive account of the ruins, expressing his firm conviction that Silchester was the Calleva Attrebatum of the Romans, situated at the junction of several of the great Roman roads, one leading to Venta Belgarum (Winchester) and the south, another to London *vid* Pontibus (Staines), and another to Spanæ (absorbed by the town of Newbury), and thence to Aqua Solis (Bath), Cirencester, Gloucester, and Caerleon, South Wales. The place was the chief rendezvous of the Attrigatii, and a tribute city. Coins bearing date A.D. 50 and 60 had been found, but from the bulk of the coins unearthed there was reason to suppose that the city was founded in the reign of Constantine. The walls, considerable remains of which still exist, are one mile and a half in circumference, and inclose 130 acres of ground. The site forms part of the estate of the Duke of Wellington, who is the possessor of many most interesting relics of the Roman occupation discovered at Silchester, including a bronze eagle belonging to a Roman legion (the only specimen ever found), tesselated pavements, &c. Lord Jeffrey describes the view from the north wall leading from the amphitheatre as the most imposing he had ever seen. Mr. Parker said the city was probably built in the third century, the site being chosen from its central position. As it was a tribute city, large sums of money were accumulated there, and it became necessary to fortify it. The walls, gates, forum, temple, Roman villas, baths, amphitheatre, and the contents of the museum were successfully described, and in the evening the party returned to town. The arrangements were carried out by the hon. secretary, Mr. S. W. Kershaw, F.S.A., assisted by Mr. Walter Money, of Newbury.

SOMERSET ARCHÆOLOGICAL SOCIETY.

The thirty-fourth annual meeting of the Somersetshire Archæological and Natural History Society commenced at Chard on the 15th inst. A local museum was arranged in the Town-hall, under the direction of Mr. W. Bidgood, of Taunton, the assistant secretary and curator. There was a good attendance at the general meeting under the presidency of Mr. Charles I. Elton.

The annual report, read by Mr. E. Green, one of the hon. secs., was of a satisfactory nature, and its adoption was moved by the Very Rev. the Dean of Wells, the seconder being Mr. J. Murch, of Bath, who invited the members to visit the important excavations which were now being made in the neighbourhood of Bath. In that neighbourhood by far the most important and interesting discovery of modern years had been made during the last twelve months. For many years it was known that in the neighbourhood of Bath there was probably a large structure many feet under ground, and a few years ago the City Surveyor of Works, in making alterations in the city, discovered, 15 ft. below the surface, the remains of a very large Roman bath, corresponding in importance with those of Rome itself. He hoped those who might find themselves in the neighbourhood of Bath would do them the honour of going to see the excavation.

The President then delivered an interesting address, dealing with the antiquity of man as exemplified by the barrows and other remains of the district. He said the history of man in the Somersetshire hills went back to a very remote antiquity, recent discoveries having shown that men of the Palæolithic age lived in the valley of the Axe. Stone axes were almost the only relics of these oldest inhabitants, and they hardly knew more than that these men chased wild beasts. Geologists had made it certain that Somerset and the hills which bounded it were once quite 100 fathoms higher than now, and that the whole shelf, from the Bay of Biscay to the North of Scotland, was dry ground, while enormous herds roamed on the grassy plains which existed where the Bristol Channel now flows.

The members then visited the Cornhill banqueting-hall, church, and grammar school. After luncheon there was a carriage excursion to Membury camp, church, and old meeting-house, and an evening meeting was held at the Town-hall for papers and discussion.

The second day's excursion embraced the Roman villa at Wadeford, Combe St. Nicholas Church, Northay barrow, Whitestaunton Church, camp, barrow, and manor-house, the President inviting the society to luncheon. Weston Manor-house, the seat of the Bonnor family, was then visited, also Wambrook Church; and another evening meeting was arranged for papers and discussion.

The third day's programme comprised Leigh House, Ford Abbey, Winsham Church, Weyford Church and manor-house, returning by Rounham and Cheriton Down to Cricket St. Thomas Church and lodge.

The Telephone to Brighton.—The United Telephone Company are making arrangements for connecting Brighton with the metropolis.

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PROPOSED NEW BRIDGE AT BEDFORD.

The designs sent in for this work have been on view in the Corn Exchange, Bedford, and are described in the *Bedfordshire Times* of the 19th inst. The number of designs sent in exceeded anticipation. Mr. A. Billingham, London, sends in an estimate for the bridge and approaches of 17,721*l.* 6s. 11d. His design is that of a lattice-girder bridge of three irregular spans, with stone piers and abutments. The next highest tender is that of Mr. F. Walsh, Burnley, which amounts to 17,412*l.*, and includes the whole of the work proposed to be carried out. He suggests the erection of a bowstring-girder bridge of one span, which alone would cost 10,610*l.* He also sends in an alternative estimate of 15,837*l.* if ordinary stone be used instead of granite in the abutments and retaining walls. Mr. W. Hillman, Newcastle-on-Tyne, comes next with a tender of 14,557*l.* His design shows an iron arch bridge of three spans, with stone abutments, wing walls, and cast-iron columns. Messrs. Dyne, Steele, & Co., Newport, Mon., estimate for a wrought-iron arch bridge of two equal spans, with brick and stone pier and abutments. The estimate for it reaches 14,300*l.* Mr. C. W. Whitaker, Westminster, sends in the plan of an iron arch bridge of three equal spans, the estimate for which, together with the approaches, amounts to 9,740*l.* Mr. R. H. Twigg, Westminster, shows a perspective view of a continuous girder bridge with three openings, the piers being of brick with stone dressings. The estimate given with it is 13,800*l.* Mr. Whitehead's (Lincoln) estimate of 8,490*l.* is for a continuous girder bridge of three spans, with brick and stone abutments and piers. The design from Mr. Jepson, of Stockport, is also that of a continuous girder bridge, with a centre pier of stone and brick, his estimate of 12,500*l.* including the approaches. The carrying out of a design sent by Mr. A. Hemingway, Westminster, is estimated to cost 12,110*l.*, the bridge alone, which is designed as a lattice-girder bridge, of two small and one large span, with open parapets, being estimated to cost 10,070*l.*, and the approaches 2,040*l.* Mr J. B. Everard, Leicester, sends a perspective view, with plans and details, of a bridge with one large centre span and two smaller side arches, all of wrought iron, with brickwork piers and abutments, and stone dressings. The tender for this bridge is 11,260*l.* 12s. Messrs. H. Young & Co., Westminster-chambers, send in the plan of a bridge, designed by Messrs. Maynard & Cook, engineers, Westminster, the bridge itself being estimated to cost 6,500*l.*, while the approaches, ornamental work, &c., bring up the total to 11,760*l.* The bridge, of which a perspective is shown, is a light-looking structure of three spans, one large and two small, with open iron girder arches. A tender coming close to it,—viz., that of Mr. Parkinson, of 11,650*l.*,—is also for a three-arched bridge of wrought iron, the spandrels being filled in with lattice work. Messrs. Heenan & Wodehouse, Newton Heath Ironworks, near Manchester, contribute the design of a lattice-girder bridge of three irregular spans,—a large central and two small side spans,—the piers being of ornamental brickwork, and the wing walls of the same material. The bridge was designed by Mr. N. H. Heenan, C.E., and the estimated total cost, including the approaches, is 11,412*l.* Without the approaches, which the firm suggest should be carried out by a local contractor, the tender would be 1,786*l.* less. Mr. J. B. Read's (Westminster) design is that of a wrought-iron bridge of three nearly equal spans, having piers of brick with stone facings. The tender for it is 8,700*l.* Mr. W. Wardle, Newcastle-on-Tyne, sends the design of a bowstring girder bridge of one span, abutments of brick and stone, with concrete filling. 10,494*l.* is the estimated cost, including the buttresses and approaches. The Cleveland Bridge and Engineering Company, Darlington, send a perspective of an iron archway-bridge, of three spans, but no details, estimating the cost of its erection, together with everything included in the advertisement and tender, to be 9,945*l.* Mr. J. J. Henderson's (Dundee) estimate of a lattice-girder bridge of three nearly equal spans is 9,500*l.* Messrs. Clarke & Moore, Hull, send in three designs; 1 and 2 are bowstring girder bridges of one span, while design 3 is that of a bridge of three spans, with a large central bow-string, and two smaller side girders. The columns supporting the bridge are of cast iron, filled with concrete, while the abutments are of masonry. Design 1 is estimated to cost 11,965*l.*; design 2, 7,460*l.* 6s. 9d.; design 3, 6,485*l.* 10s. 8d. Two designs are sent by Mr. Oscar Reichenbach, Westminster. One is that of a three-arched girder bridge, of equal spans, with a highly-ornamented balustrade. This and the approaches are estimated to cost 6,484*l.* 12s. 6d. The other design is of a brick bridge of three spans. A perspective is shown giving it the appearance of a substantial structure. The tenders for this amount to 6,088*l.* 1s. Messrs. Dawson & Fison, Queen Anne's Gate, Westminster, tender for the whole of the work, their estimate reaching 9,530*l.* Their design shows a continuous lattice-girder bridge of one large central and two small side arches, resting entirely on iron columns, it being proposed to build the abutments of brick. Mr. T. D. Evans, South Shields, estimates the construction of an iron bridge, &c., of two unequal spans,—one a bowstring and the other a flat lattice girder span,—to cost 8,191*l.* 2s. Mr. W. Gallon, Tottenham, sends the design of a wrought-iron bridge of three arches,—one of 80 ft. and two of 60 ft.,—resting on brick piers and abutments, the piers bearing castellated caps, the total cost being 9,757*l.* Mr. R. S. Miller, Wolverhampton, estimates the whole of the work at 9,000*l.* The design he sends possesses a feature not seen in either of the other plans; it shows the roadway suspended from two iron girder arches, which rest on brick piers with stone dressings. Messrs. McKeone & Robinson, London, tender for a design by Mr. T. Claxton Fidler. The estimate for bridge, approaches, and all materials comes to 7,800*l.* The bridge is a continuous lattice girder one with a large central span of 85 ft. 4 in., and two of 62 ft., resting on cast-iron cylinders 6 ft. in diameter, with wing-walls of rubble stone and ashlar dressings. Messrs. J. Tillotson & Company, Leeds, compete with the design of a lattice girder bridge of three equal spans of 66 ft. 8 in., with brick abutments and cast-iron central columns. The bridge itself is estimated to cost 5,700*l.*, but the approaches bring the tender up to 9,800*l.* Mr. J. Webster (Liverpool) sends in three designs; one is a continuous girder bridge of three equal spans. This design comes to 7,003*l.* 5s. 6d. The second, estimated to cost 7,053*l.* 10s. 5d. in construction, is a bowstring with flat lattice-girder sides; while the third is a wrought-iron arch bridge of three spans resting on brick piers with stone facings. The abutments also show stone dressings. The tender for this amounts to 7,427*l.* 13s. 4d. If a parapet wall be erected on each side instead of a wooden fencing, there will be an additional 429*l.* 10s. in each case. Messrs. Page & Nunn, Theobald's-road, London, send in a design of a wrought-iron three-arched bridge, of apparently equal spans. The piers, which are composed of brick and stone work, are built on iron cylinders 2 ft. below water-mark, and the estimated price is 10,500*l.*

PROGRESS OF THE LIVERPOOL DOCK WORKS.

SLUICING THE PLUCKINGTON BANK.

The report of the Engineer to the Mersey Docks and Harbour Board, Mr. George Fosbery Lyster, on the general state and progress of The Dock works of Liverpool and Birkenhead, and of the expenditure in his department, has just been issued. The report is dated from July 2, 1881, to July 2, 1882, and gives the clearest internal evidence, not only of the prosperity of the Dock Trust, but of the remarkable result of one year's activity in the most practical department of the estate. The point of the voluminous document is summed up in two lines at the end of the report, to the effect that the whole of the docks and appliances belonging to the Mersey Docks and Harbour Board had been maintained in efficient working order, while the total amount of expenditure involved in effecting this object figures at 564,258*l.* 18s. 6d. One of the most interesting features is a statement with regard to the landing-stages and approaches, which reads as follows:—

The Pluckington Bank.—The whole of the sluicing outlets at the George's Pier were completed, and their systematic working was commenced, in the middle of September last. By this time the "tail" of the Pluckington had so far extended as to cause the stage to ground for a length of 1,130 ft. on the east and 510 ft. on its west side. The quantity of sand and silt to be removed before it would become waterborne at a 10-ft. ebb being about 20,000 tons, representing a depth of from 6 ft. to 7 ft. from its southern extremity to No. 2 bridge, and about 5 ft. thence to a point slightly short of No. 4 bridge. After the sluicing had been continued for some time, and the sand sufficiently removed abreast of the outlets, that operation was necessarily suspended for some months, while the northern portion of the bank was being reduced by scraping, scoring, and ultimately by excavating between the east side of the stage and the river wall northward, and beyond the range of the sluices. This latter operation was effected by means of Priestman's patent grab-bucket, which was found most effective for this special class of work. In March the partial working of the sluices was resumed, and towards the end of April they were run "full bore," and since then they have been in regular operation during the low water of spring tides. The effect has been that the southern portion of the bank (abreast of the sluices) upon which the stage rested has been so far removed as to admit of the structure being fully waterborne for this length, thus fully indicating the ability of the sluices to carry out the work for which they were designed. In consequence of the great rushing force of the water through the sluice mouths, the tendency, by reason of the "back lash," was to undermine the concrete "apron" which had been extended along the front of the outlets and beyond the foundations upon which the pipes rested. To obviate this I adopted a system of saddle-piling, which has secured their safety. In the beginning of May the scoring operations under the stage and to the northward of the sluices were stopped, but it has been found necessary to continue the "grab," as a deposit still occurs along the foreshore north of No. 2 bridge; here, also, the stage is fairly waterborne at low spring tides, but the depth is not so great as that along its more southern section. It having been found tedious and inconvenient to work the sluicing paddles by hand-power, an Otto gas-engine has been applied for the purpose, and thus the operation is largely facilitated.

With regard to the works of dock extension now in progress, we append some particulars.

New North Works.—The excavation for this dock is nearly completed, and that for the wall-foundation is in a forward state. The south wall, for a length of 1,000 ft., is built to a height of 2 ft. above old dock sill datum, and the remaining 372 ft. of its length is raised to the old dock sill level. The west wall, 566 ft. in length, averages in height 18 in. above datum. The north wall, for a length of 108 ft., averages 2 ft. in height above the datum, and a further length of 1,052 ft. is at an average height of 3 ft. below it, the foundation of the remaining 448 ft. of its length being not yet laid. Of the east wall, 202 ft. lineal is built to an average height of 3 ft. below datum, and the remaining 223 ft. of its length is not yet commenced. The masonry pits are ready to receive the machinery for actuating the gates. The whole of the sheds upon the quays are now completed, with the exception of the floor of the western half of that on the north quay of No. 3 branch. The roadways of the various "tongues" intervening between the branch docks are completed, and the approach roadway to the north shed of No. 3 branch, as well as the road flanking it on its north side, have been paved for a width of 40 ft., and fenced off from the works still in progress. The quays at the east ends of the branches are necessarily for the present in use as unloading berths and as depôts for materials for the works in progress. The roadway flanking the shed on the west quay of the Alexandra Dock, which includes a double line of railway, is completed for a width of 56 ft., and the remaining 34 ft. along this position is levelled off with the rock *débris*. A building erected for the purposes of sheltering the passages between the Langton and the Alexandra Docks, also providing workmen's cocoa-rooms and electric-light engine-house, and a police hut, has been constructed near the river-wall abreast of the passages referred to. The work is in a forward state, and is nearly ready for use. Wind-screens in connexion therewith have also been partially constructed. The Langton Dock entrances, having been opened on the 8th September last, were for some time worked to a limited depth of 9 ft. below the datum in consequence of the unfinished condition of the basin. This depth was in March last increased to 11 ft. below that level, or 1 ft. short of

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the maximum depth intended, viz., 12 ft. The completion of the basin to its 14-ft. level has since so well advanced as, doubtless, to admit shortly of the entrances being brought into use at their full working depth, viz., 12 ft. below old dock sill. . . . . The following figures represent the general quantities of work done in connexion with the foregoing during the past year, viz. :—Excavations, 411,500 cubic yards; masonry, concrete, and brickwork, 47,398 cubic yards; paving to quays and roadways, 18,322 square yards; piling, 647 cubic feet; permanent railway along the quay, 337 lineal yards; asphalte floors in sheds, 113,500 square yards; zinc covering to roofs, 140,000 square yards.

New Works at the South End.—The excavations for the new docks south of Brunswick Graving Docks is now in progress; about 62,000 cubic yards have been removed during the past year, making a total of about 124,000 cubic yards from the commencement, which have chiefly been deposited to form the quays. Additional appliances have been provided to push on the work in this position with greater speed, and with this object an increased number of men have been drafted from the completed works on other parts of the estate. A length of 300 ft. of the river-wall across the gap south of the Toxteth Dock has been built up to a height of 20 ft. above datum. The foundations of this part of the work were taken down to a level of 17 ft. below the old dock sill, on to the rock, which was found to underlie a bed of gravel 2 ft. in thickness. The quantity of masonry built amounts to 5,400 cubic yards. The raising and strengthening of the river-wall southward of this point and abreast of the dock are progressing favourably, 227 lineal feet having been built to the required height of 31 ft. above the old dock sill. The masonry necessary to close the old entrance to the Harrington Dock is completed. North of Herculaneum Half-tide Dock, the excavation of Dock K to the depth originally intended, viz., 12 ft. below the old dock sill datum, having been nearly completed, the consideration of lowering both sills and dock from 10 ft. and 12 ft. to 12 ft. and 14 ft. respectively, was entered upon by the Board, and these changes having been favourably considered, an order was given accordingly. The work involved by the increase depths is now in course of progress. The total quantity of excavation, mostly rock, removed from the dock, is about 587,000 cubic yards. The masonry of the walls is completed, and that of the south passage, with its side walls and bridge pits, is also finished. The bridge which is to span the 60-ft. passage is ready for fixing in place, having been built in the dock-yard. At the Herculaneum Half-tide Dock a dam is in course of erection in front of the south entrance, to exclude the tidal water, so as to admit of the work in connexion with the lowering of the sills from their present level of 8 ft. to 12 ft. being carried out.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

3,829. T. S. Wilson and H. T. Johnson, Manchester. Apparatus for ventilating sewers, soil-pipes, &c. Aug. 11, 1882.

3,844. E. A. Brydges, Berlin. Manufacture of reed fabrics for ceilings. (Com. by P. Strauss and H. Ruff, Cottbuss, Prussia.) Aug. 12, 1882.

3,900. W. J. Henry, London. Smoke-consuming grates. Aug. 15, 1882.

3,909. W. P. Thompson, London. Construction of roads and ways, &c. (Com. by A. C. d'Alma, Paris.) Aug. 16, 1882.

3,921. S. Fisher, London. Fabrics for covering walls. Aug. 16, 1882.

3,929. H. Darby, London. Apparatus for heating baths. Aug. 16, 1882.

3,930. G. Henderson and D. McNeil, London. Water-waste preventer. Aug. 16, 1882.

3,944. G. J. Dickenson, Albany, U.S.A. Sash-fasteners. Aug. 17, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named :—

August 15, 1882.

1,836. W. Walker, New York, U.S.A. Manufacture of artificial stone. April 18, 1882.

1,857. W. Blyth, Barton-upon-Humber. Manufacture of bricks and tiles, &c. April 18, 1882.

August 18, 1882.

1,751. W. P. Thompson, London. Window-cleaning chairs, &c. (Com. by A. Dormitzer, New York, U.S.A.) April 13, 1882.

1,792. A. W. L. Reddie, London. Ventilators for buildings, &c. (Com. by A. Huber, Cologne.) April 14, 1882.

3,301. P. S. Webb, London. Preserving from corrosion the surfaces of piers, bridges, &c. July 12, 1882.

ABRIDGMENTS OF SPECIFICATIONS.

Published during the Week ending August 19, 1882.

46. W. Haughton, London. Open fireplaces or grates, &c. Jan. 4, 1882. Price 6d.

The fireplace is quite separate from the chimney recess, and has round its back and sides double walls, the space between which is used for heating air, which passes into the room through a chamber above the fireplace. The fire-basket has a solid bottom, and horizontal bars at the back. Above these is an adjustable hanging door, or register, governed by a rod and cam, whose handle is in front of the stove. By shutting this the smoke is made to pass to the back of the fireplace behind the horizontal bar, where it is consumed.

77. H. Reid, London. Machinery for moulding and forming cement and other concretes, for paving, &c. Jan. 6, 1882. Price 2d.

The moulds are given a vibratory motion, so that all the corners are filled up. No drawings have been filed, and the machine, therefore, cannot be described.

119. E. R. Wethered, Woolwich. Window sash-fastenings. Jan. 9, 1882. Price 6d.

The locking-bolt has a stud on it, which travels in a slot in the casing on the sash, and its end is a T-shaped head. The slot is of a ⊥ shape, and when the bolt is pushed out the stud traverses the shank of the ⊥, and the head passes through the catch on the upper sash. The bolt is then turned so that the stud traverses the base of the ⊥-shaped slot, and the T-shaped head locks the sashes.

135. F. Holmes, New-cross. Manufacture of fire-lighters. Jan. 10, 1882. Price 6d.

A conical or tapered hole is formed through the fire-lighter, which is made in a die, and a plunger presses the material in the die.

162. A. T. Angell, London. Syphon-traps for drains. Jan. 12, 1882. Price 2d.

At the bottom of the inlet end of the syphon is a spout, through which all the water passes in a small stream into the centre of the water contained in the syphon. (*Pro. Pro.*)

172. J. Jackson, London. Apparatus for mixing the materials used in the making of concrete. Jan. 12, 1882. Price 6d.

From the hopper the materials fall down a main shoot, in which are a series of inclined shelves so arranged that the material in falling is thrown from one to another. Water may be mixed with the materials during their descent.

188. J. Parrott, Wallington. Warming and ventilating apparatus. Jan. 13, 1882. Price 2d.

A chamber is made below the grate, in which air is warmed and then discharged into the room. (*Pro. Pro.*)

199. J. F. Hayne, London, and G. B. Lovedee, Birmingham. Stoves, lamps, &c. Jan. 14, 1882. Price 2d.

A double casing is formed round the stove or lamp, through which air is admitted into the interior, and in which it is warmed. (*Pro. Pro.*)

411. C. Pieper, Berlin. Sewerage gullies. Jan. 27, 1882. Price 6d.

A deep vessel is formed, the walls of the upper half of which are perforated. The mud falls to the bottom of the vessel, and as it fills with water the straw or other floating material is prevented from flowing out by the outlet from the upper part of the vessel by the grating. If this outlet gets choked the water can pass away by a syphon-pipe, which rises out from the lower part of the vessel leading to the sewer.

EXETER ART EXHIBITION.

The second Art Exhibition held in the Albert Memorial Museum was opened on the 15th inst. It consists of works of art from residents in Devonshire. There are some good original designs in the department for decoration and furniture. Mrs. Hobbath, Exeter, sends a design for linoleum, and another for wall decoration; Mrs. Bishop, Starcross, oil-paintings of summer and winter for hall decoration, design for interior decoration and dining-room, art-furniture in perspective; I. Lemon, Exeter, design for dining-room door in oil-colours; G. Mitchell & Son, Exeter, tapestry panel screen of good design by Miss Elsie Fortescue, Torquay. In the Art-Furniture department, Messrs. Wilson & Son, Exeter, exhibit a wood chimney-piece and mantel in the Queen Anne style in American walnut; Mr. Mark Rowe shows chimney-piece and over-mantel, in mahogany, in the Queen Anne style. In art-needlework some good specimens are exhibited. A gipsy table-cloth, embroidered with silk, original design by Miss Sarah Hayward, Exeter; small table-cloth, in imitation of Eastern embroidery, by Miss Johnson, Torrington; a coat of arms and the arms of Exeter, worked on silk, by Miss Sarah Cockerham, Alphington; the "Death of Douglas," "The Lacemaker," and "The Pedlar," by Mrs. Pepin, Exeter. Some good designs for lace: Design for lace shawl,—ground-ivy and cinquefoil; Honiton lace flounce,—potato and cuckoo-flower; Honiton lace collar,—violets, by Miss E. B. Secker, Exeter; design for lace for bannerettes, and design for priest's stole, by Miss Mary E. D. Lott, Honiton; design for lace shawl, by Miss H. J. K. Cornish, Ottery St. Mary. All the works now seen are greatly in advance of those exhibited at the first Exhibition, last year. EXETER.

METROPOLITAN BOARD OF WORKS.

The Board's offices at Spring-gardens will be painted and cleaned internally during the recess, the contractors being Messrs. Greenwood, of Arthur-street West. The Board-room will, at the same time, be warmed and ventilated upon an entirely new system. This portion of the work will be carried out by Mr. D. O. Boyd, of Maddox-street, in accordance with drawings and a specification prepared by Mr. George Vulliamy, the architect to the Board. The Board's offices, as we have had occasion to note from time to time, have been added to considerably since their first erection, and the difficulty of maintaining efficient ventilation in the interior has been consequently increased. Our public buildings appear to be considered unworthy even of the sanitary precautions which are applied to private houses.

PERCENTAGE ON PRIVATE STREET IMPROVEMENTS.

A Local Government Board inquiry was held in the Vestry-hall, Chiswick, on Monday last, by Inspector Thornhill Harrison, in respect to an application by the Chiswick Improvement Commissioners, for the sanction of a loan of 15,000*l.* for the making up and taking over of about thirty-five private streets, under the 152nd section of the Public Health Act, 1875. The usual notices had been issued to the adjoining owners, and they had failed within the month to make them up according to the Act. A long discussion arose as to the 5 per cent. on the cost of the works, which was included in the contractor's tender; but which was, as in former cases, to be paid to the Clerk and to the Surveyor to the Commissioners for the preparation of the plans and specifications, and for making out the apportionments of the costs and collecting them.

The Inspector stated that the Local Government Board had decided that 2½ per cent. only was a fair sum to be added to the actual cost of the works, and that nothing should be allowed for the preparation of the plans. He contended that the Improvement Commissioners would have to prepare the plans and specifications, and do all preparatory work up to the time of serving the notices, whether the adjoining owners or the Commissioners carried out the work. The 2½ per cent. paid to the surveyor for the preparation of the plans should not have been put on the tender at all, as the Commissioners called upon the owners to make up their streets according to those plans. If the owners had done the work, neither the Commissioners nor the surveyor could charge anything for the preparation of the plans and specifications. If the owners did not do the work, and the Commissioners did it, and their surveyor superintended the execution of the work,—which in most cases it was desirable that he should do,—it was a fair thing to charge 2½ per cent. for that superintendence.

Mr. Cannot, solicitor, informed the Inspector that he had been sent by the Chiswick Ratepayers' Defence Association to object to the charge of 5 per cent. made upon the owners. The subject of that charge had created a great deal of talk in the neighbourhood.

The Inspector further stated that he had nothing to do with the salaries of the Clerk or the Surveyor. The Commissioners might, if they chose, make arrangements so that those salaries should cover the per-centage for the execution of the work; but the only addition that could be made to the actual cost of the work was 2½ per cent.

The Clerk said that it was in consequence of the adjoining owners failing to make up the roads themselves that they were charged the 5 per cent.

The Inspector, in reply to the Clerk, gave it as his opinion that the Commissioners were not entitled to charge even the expenses of collecting the apportionments of the costs. Even interest on the borrowed money could not be allowed. He contended it was the duty of the surveyor, as soon as the work was done, to ascertain the cost of the work, and, having done that, to apportion the cost among the adjoining owners; and there was no reason why the money should not be got when the work was finished. There was nothing in the Act about interest or legal expenses. The Commissioners did not borrow the money to keep it in the bank, but borrowed it as it was wanted. If there was any interest, the money should come out of the general funds of the rates, as the making up of these streets was desirable on public as well as private grounds.

The Clerk pointed out that the Master of the Rolls had recently laid down the law that the Commissioners could not make a demand for the money until three months after the apportionment of the costs; that was to say, the adjoining owners had three months within which to dispute the apportionments. That was only fair, as there might be overcharges against which it would be necessary to appeal.

The Inspector said that notwithstanding that decision, only 2½ per cent. beyond the actual cost could be charged. The Inspector took evidence as to the manner in which the streets had been constructed, and said that the reply of the Local Board would be given soon.

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street.

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THE NEW MUNICIPAL BUILDINGS FOR GLASGOW.

Mr. G. Linwood writes to the *Glasgow Herald* with reference to the choice of material for these buildings. He says:—

"Every one in Glasgow is familiar with the appearance of the Municipal Buildings in Ingram-street. The stone of the more recent portion of the buildings is undergoing a continued process of decay. From time to time it has been patched up, and a sorry sight it presents to-day. Are we to have a repetition of the Ingram-street fiasco by perpetuating the admirable designs of Mr. Young in a material which cannot stand the smoke-laden atmosphere of our city? Why not use granite freely throughout the new buildings? That material would certainly be a vast improvement upon the soft and questionable freestone, and Glasgow would at last have a municipal building worthy of her traditions. That fact would amply compensate for a little extra expense in the building materials. I venture to throw out the suggestion in the hope it may receive some support at the hands of those chiefly concerned,—the citizens of Glasgow."

The Council of the Glasgow Institute of Architects have now nearly completed their arrangements for the exhibition of sketch designs of the plans sent in for competition in connexion with the New Municipal Buildings. There were in all 100 competitors. The exhibition will open on the 2nd of September.

NOTES FROM BRIGHTON.

The Health of the Town.—The Committee appointed to vindicate the reputation of the town as a health-resort against the statements made in the *Lancet* and elsewhere have issued a pamphlet, entitled "Brighton as it is." As may be supposed, it makes the most of the great natural advantages possessed by the town, and appeals to the Registrar-General's returns of the annual rates of mortality in support of its main position, viz.,—that those natural advantages combine to make the town one of the healthiest in the kingdom. According to the writer, in 1876 Brighton was first (showing the lowest death-rate) on the Registrar-General's returns of the annual rates of mortality in "the twenty large towns of England." She was second on the list in 1877, third in 1878, second in 1879, first in 1880, and first again in 1881. We are told that the statements complained of are resented "not so much because they made unpleasant and damaging charges, but because they were not borne out by facts." Without at the present time making any damaging statements, it may not be out of place for us to warn the municipal authorities against the assumption that efforts are not necessary on their part to put the town in a right condition. Some years ago, on the occasion of the visit of the Social Science Association to Brighton, so charming in many parts, the Conductor of this journal, after a survey of the less frequented parts, as a member of the Health Section, found himself compelled to make some statements which raised the ire of some of the inhabitants, but which were, nevertheless, perfectly correct, and called loudly for attention. We mention this as showing that a town which to the ordinary observer, and even to the reader of average results, presents a satisfactory aspect from a sanitary point of view, may yet have its black spots obvious to those who know where to look.

Proposed Western Lawn.—At the meeting of the Brighton Town Council last week, the Works Committee reported that they had instructed the surveyor to bring up a plan showing what space on the beach between the West Pier and the Western toll-house was available for the purpose of a lawn or public promenade; and Mr. Sendall said he hoped the plans would be ready for the next council meeting.

Road Gullies and Catch-pits at Hove.—The attention of the Hove Commissioners having been drawn to that portion of Sir Joseph Bazalgette's report upon the drainage of Brighton and Hove, which suggested the making of catch-pits in connexion with the street gullies, in order to intercept the road *detritus*, their surveyor (Mr. E. B. Ellice-Clark) was requested to prepare plans for carrying out the necessary work, and at the monthly meeting of the Board on the 17th inst., the plans were adopted, and, upon the recommendation of the Works and Improvements Committee, it was resolved to borrow 2,580*l.* to defray the cost.

Encroachment of the Sea at Hove.—Considerable inroads having been made of late by the sea upon the foreshore at Hove, the Commissioners of that district have directed Mr. E. B. Ellice-Clark, their surveyor, to report as to what remedial measures he would recommend. At the last meeting of the Board, Dr. Millard said the sea had encroached still more during the previous forty-eight hours, and was then within eight yards of the lawns. He suggested, for the consideration of the surveyor, a similar system to that adopted at Littlehampton, where he explained how groynes were erected with their land ends at angles of about 60 degrees, and meeting at the seaward ends, forming a triangle. The sea, he said, washed up over these, and the shingle was retained in the "quarters."

PROVINCIAL NEWS.

Birkenhead.—In his annual report to the Mersey Docks and Harbour Board, Mr. G. F. Lyster, the engineer to the Board, alludes to the increased provision which has been made in the Birkenhead Docks for the importation of cattle and dead meat. The lairage on the north side of the Alfred Dock has been furnished with pens and water-troughs similar to those in the sheds, the floor concreted, and a water service laid. By this arrangement accommodation is provided for 374 cattle. At Woodside four chill-rooms, each capable of holding 250 carcasses of beef, have been erected. The refrigerating machinery, which is being provided by Messrs. Haslam & Co., of Derby, will shortly be ready for use.

Hull.—On the 18th inst. a large number of the members of the Institution of Mechanical Engineers visited Hull for the purpose of inspecting the new Alexandra Dock works of the Hull and Barnsley Railway and Dock Company and the large engineering and ship-building establishment of Earle's Company, situated to the eastward of the River Humber. The party included the president of the society, Mr. Westmacott, C.E., Mr. Abernethy, C.E., Mr. Kitson, C.E., Mr. E. Samuelson, and many other gentlemen. At the Alexandra Dock works there are some 2,000 men employed, principally in excavating and walling. Of the former, two and a half million cubic yards have yet to be got out. The men, with the assistance of the steam navvies, cranes, &c., are getting out fully 120,000 cubic yards per month. When the works are completed there will be 1¼ mile of dock walling, and a similar extent of sea-wall. The visitors were greatly interested in the working of the hydraulic and steam excavators, and also inspected the hydraulic engine-house and observed the powerful engine constructed for hydraulic and other purposes in motion. Messrs. Lucas & Aird are the contractors, Messrs. A. C. Kourtzy & G. N. Abernethy being the resident engineers. The visitors subsequently proceeded to Earle's ship-building yard and engineering works, which cover an area of 30 acres, and do the whole of the work in connexion with the construction of ships and their engines.

Salisbury.—The Wilts and Dorset Banking Company have been making extensive additions to their premises in Salisbury's picturesque market-place. The original building was built from the designs of Mr. Henry Hall, some twenty years ago. It is of Classic character, as regards its style of architecture,—boldly and freely treated. The present work, now drawing near completion, is a continuation of the main structure,—an undertaking fully prepared for in designing the original façade, and in the general planning. The front is entirely of Ham Hill stone, and exhibits much fine masonry and carving. Mr. Hall has acted as architect for the additions. Upon the parapet of the building is a large sculptured representation of the double-headed and collared eagle, the arms of Salisbury. This is in Portland stone, and the work of Mr. Harry Hems, of Exeter, by whom the whole stone-carving upon the new portion of the building has been executed. The builder who commenced the work did not complete it. It has been finished by Mr. Barber, builder, of Brown-street, Salisbury.

Dwellings in Flats for the Middle Classes.—The London Scottish Dwellings Society has been established, for the erection of dwelling-houses for the middle classes in London and its suburbs, divided into flats or floors as in Scotland, and in order to meet the wants of families, at rents ranging from 20*l.* upwards.

ZANZIBAR CATHEDRAL.

Our readers are aware that even in this remote district the services of the church will not be wanting in reverence for the lack of suitable fittings. A large shipment of church furniture has lately been sent out there, which comprises amongst other things, brass lectern, altar cross, vases, candlesticks, "Hesperus" lamps, choir-desks, hangings, carpets, &c. The order was entrusted to the firm of Jones & Willis, of Great Russell-street, London. As the goods had to be carried on men's backs for a long distance up the country, they were packed in cases not exceeding 40 lb. in weight. The same firm have now on view a novel kind of font in polished brass, designed by the architect, Mr. C. F. Hayward, F.S.A., of 20, Montague-street, Russell-square, for the same cathedral.

THE REGULATION OF RAILWAY CLOCKS.

Sir,—Now that electricity is being used in so many ways to make so many improvements, it is quite in season, I think, that something should be done to regulate the time of railway clocks. I do not know whether it has been generally noticed (perhaps not), but it is a fact, that very few clocks at our principal railway termini and stations tally with one another. I have taken notice for the past few weeks of this, and have invariably found a difference of two, three, and even more minutes; but the climax was reached only two or three days ago, when the times of the dials at King's-cross and Notting-hill showed a difference of *eight* minutes. Seeing what many men of business may lose by these differences, and how many private people may be put to inconvenience of waiting, by missing trains through this neglect on the part of some one, and having in view the facilities which the railway companies possess for altering this nuisance, surely something might be done, without very great expense, to grant the public a boon, the absence of which at present is the cause of many losses both of time and money. Should you think fit to devote a small space to the above facts, the influence of your journal might be the means of bringing about some kind of reformation.

Jas. R. Morgan.

CASE UNDER THE METROPOLITAN BUILDING ACT.

BY-LAWS: BAD MORTAR.

On Wednesday, August 16, Mr. S. Muncey, builder, was summoned to Worship-street Police Court by Mr. A. Payne, District Surveyor for East Hackney (South) and North Bow, for constructing two houses in Hepscott-road, Hackney Wick, with mortar mixed with earthy matter. Samples of the material used in lieu of sand were shown in court. Defendant's counsel at first denied that the material had been used, and called a surveyor who affirmed that the mortar was good; but subsequently one of the defendant's own witnesses admitted having mixed the mortar with materials similar to the specimen shown.

The defendant was fined 60*s.*

CHURCH-BUILDING NEWS.

East Teignmouth.—East Teignmouth Church has been re-opened, after works of internal restoration costing 1,100*l.* Not long since, owing to the exertions and influence of the Vicar (the Rev. H. C. Deshon), a new chancel, costing, with all its decorations, 2,500*l.*, was erected, and this had the direct effect of rendering apparent the necessity for renovating the interior of the nave. Plans were prepared by Mr. R. Medley Fulford, of Exeter, under the instructions of a restoration committee, which had Mr. E. Atkins as secretary, and the work was undertaken, and has been successfully carried out, by Mr. Robert Davis, of Newton. The old wooden galleries on the north and south side of the nave have been removed, as also has the partition which separated the transepts from the body of the church. The stunted transepts now have the effect of making the church cruciform, and have been appropriated to the use of the public, being filled with free seats. In the place of the old and unsightly stone and plaster windows, there have been put Bath stone windows of neat design filled with tinted cathedral glass, the tracery being enriched by a little colour. The whole of the windows have, with two exceptions, been treated in this way, the exceptions being the

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north transept window, which will be filled in with stained glass by Miss Cousins, and the westernment window in the north aisle, which is the gift of Miss Fripp, of The Grove, Teignmouth. To provide accommodation in the place of that which has been taken away by the removal of the side galleries, a gallery has been constructed across the whole of the west end of the church. The entire building has been fitted with comfortable seats of pitch pine. Sitting accommodation is now provided for 847 persons. The aisles have been cemented preparatory to tiles from the Aller Pottery being laid, and the pews are floored with red deal. The warming apparatus has been supplied by Messrs. Haden & Son, of Trowbridge.

Cullercoats.—On the 4th inst. the Duke of Northumberland laid the foundation-stone of the new Church of St. George, Cullercoats, which is to serve the wants of a new ecclesiastical district which has been formed, comprising Cullercoats and the northern portion of Tynemouth. The Duke has given the site, and undertakes the entire cost of the erection, which, it is estimated, will amount to about 18,000*l.*; he has also given a site for a vicarage-house; and, jointly with the Ecclesiastical Commissioners, has provided an endowment to the amount of 300*l.* a year. The church will be of the Thirteenth-century character, and of lofty and commanding proportions. It will consist of a nave, enclosing an area of 84 ft. by 56 ft., with western narthex treated as a baptistery, and entered by porches on the north and south sides. The chancel, with apsidal eastern termination, will be 50 ft. long and 21 ft. wide. A tower, in which it is proposed to place the organ, will be south of the western bay of the chancel; and the corresponding position on the north side of the chancel will be occupied by a transept about 20 ft. square, with a large vestry west of it. The total length of the church from east to west will be 158 ft., and the greatest breadth from north to south about 90 ft. The church is to be faced both inside and outside with local stone. The nave and aisles will be divided into five equal bays, and separated by simple arcades with circular columns and plain moulded arches. There will also be a narrow triforium, not pierced, and a lofty clearstory, with windows of two lights. The external surface of the clearstory walls will be unbroken, and the bays will be marked by buttresses on the aisle-walls, with a single lancet window in the centre of each bay. The nave and aisles (as well as the rest of the church) will be groined with plain quadripartite groining, with a timber roof over of steep pitch. The height inside will be 44 ft., and to the point of ridge 20 ft. higher. The chancel, including the apse, will be divided internally and externally into nine bays by upright shafts; externally the walls will be plain up to the level of the sills of the windows, 25 ft. above the floor. These windows will be of two lights, with blank arches on either side, thus giving the effect of a continuous arcade. A tall wall-arcade will surround the chancel at the floor-level. The blank triforium of the nave will be continued round, and the clearstory windows will be widely splayed, so as to completely fill each bay. The tower will rise to a height of 90 ft., and will be covered by a broach-spire of about the same elevation. The church is being built from plans prepared by and under the superintendence of Mr. J. L. Pearson, R.A., of London. The whole of the works are being executed by Mr. Walter Scott, Newcastle, under the superintendence of Mr. S. Chivers, Mr. Pearson's clerk of works; and Mr. Wm. Moore is foreman in charge.

DISSENTING CHURCH-BUILDING NEWS.

Ashton.—A new Wesleyan chapel is being erected at Ashton, near Preston. The chapel will afford accommodation for 250 worshippers, with minister's vestry, large class-room, heating-chamber, and other offices, at the west end. Local contractors are carrying out the various works from the plans and under the superintendence of Mr. David Grant, architect, of Preston.

Widnes.—On the 20th ult. the memorial-stones of what is in future to be known as the Hartland Wesleyan Chapel, Widnes, were formally laid. The new building will cost about 2,500*l.* Mr. Isitt, of Bradford, is the architect. The dimensions of the building will be 50 ft. by 58 ft., and it will be Italian in character. There will be two entrances from Irwell-street. The pews will be of deal, stained and varnished. The exterior will be of patent bricks.

Miscellanea.

Bakehouses in "Merrie Islington."—Dr. C. Meymott Tidy, the medical officer of health for Islington, in his annual report, just issued, of the sanitary condition of the parish, refers to the extract from the report of her Majesty's Chief Inspector of Factories and Workshops upon London bakehouses which some few months ago was quoted and commented upon in the public journals, and in which the condition of the bakehouses was alleged to be most unsatisfactory. He states that, although the report in question referred only to the east end of London, he had felt it his duty to direct an inspection to be made of the bakehouses in Islington, with a view to ascertain their present condition under the new *régime* as contrasted with their condition in the beginning of the year 1879, when they were first taken under the supervision of her Majesty's inspectors, and also for the purpose of having any defects now existing remedied as speedily as possible. In March, 1879, when the bakehouses were last previously inspected by the vestry sanitary officers, in one instance only was any accumulation of refuse found under the troughs, and there were no other sanitary defects observed at that time. As a result of the inspection just made, in forty-five instances accumulations of refuse were found under the troughs, and twenty-five inlets to drains were untrapped. In eight bakehouses the paving was defective. In two there were stack pipes open at the top and connected with the drains at the bottom. In a single instance a drain-pipe was found open for the reception of the water overflowing from the water receptacle. Three of the more recently constructed bakehouses had water-closets in them, while five old ones were similarly circumstanced. Dr. Tidy points out that more frequent inspection is required in order to prevent such scandalous violations of sanitary laws.

Free Opening of St. Paul's Cathedral.—The Dean of St. Paul's, writing to the Lord Mayor, who is one of the trustees of the fabric of the cathedral, on the agitation to secure the free opening of St. Paul's one day in each week, says:—"The cases are not the same at Westminster and St. Paul's. At Westminster the chapels for which a free day is given are all on the floor of the church, with open spaces about them, and people go in one way and come out at the other end. At St. Paul's the places for which a free day is asked are the crypt, with its dark corners and recesses, and the upstairs portions of the building, to which access is by long, narrow, winding staircases and passages, without any possibility of a separate entrance or exit, and where a block and crush, not unlikely in the case of the exceptional crowds of a free day, would be very dangerous. This is a matter of cubic feet which we cannot alter." With every desire to aid those who seek to open our public buildings, we are inclined to agree with the Dean and Chapter in what they say as to the difficulties of freeing entirely the upper parts of the building. A very low fee one day in the week would probably best answer the purpose.

Plumbers as Fire-raisers again.—On Wednesday afternoon what proved to be a damaging fire broke out at 394, Clapham-road, at the private house of Mr. E. Reddin. Some plumbers had been at work upon the roof, and while they were gone to dinner it was found that the top part of the house was on fire. An alarm was immediately raised, and the firemen were very soon on the spot, but the second floor had become thoroughly alight, and the flames threatened to attack the whole of the house. The roof of the next house, which was unoccupied, caught fire, and the flames spread here to the second floor. The official report ascribes the cause to "plumbers at work."

The War in Egypt.—The cabins of the Peninsular and Oriental steamers now on duty as hospital ships in Egyptian waters, have been painted throughout with Griffiths's enamel paint, manufactured by Messrs. Griffiths, Berdoe, & Co., of Liverpool and London.

Ventilation of the Reform Club.—Messrs. Robert Boyle & Son's system of ventilation has been adopted for the Reform Club by the committee and architects, and Messrs. Boyle ha[s] received instructions to proceed with the w[ork] at once.

The new Roman Catholic Cathedral a Portsmouth was opened on the 10th inst. The foundation-stone of the building was laid in December, 1879, by the late Dr. Danell, R.C. Bishop of Southwark. It was the wish of the late bishop to undertake the work of the nave first, of which five bays, forming part of the permanent church, have been built, in the hope that funds would come in to enable the transept, chancel, and side chapels to be proceeded with. But his lordship's death intervening, steps had to be taken to close in the eastern end, and provide such sanctuary and sacristy accommodation as was absolutely necessary. It consequently happens that the church has two unsightly temporary ends. The style of architecture is Early or Geometrical Decorated, *temp.* about 1450; and the material of the exterior is Fareham dark red brick, with Portland stone dressings, the roof being covered with tiles. The internal masonry is of Beer stone and the walls are plastered. The contractors are Messrs. Patman & Fotheringham, of London; Messrs. Hammer & Co., of Bermondsey, supplied the benches; and the gas fittings, altar-rail, and several fittings were furnished by Messrs. Burns & Oates. The original design (which we illustrated and described in our volume for 1879, pp. 1052—53) was from the pencil of the late Mr. John Crawley, of Bloomsbury-square, London, and since his death, the works have been completed under the superintendence of Mr. Joseph Stanislaus Hansom, F.R.I.B.A., of South Kensington. Mr. Bromfield, whose death occurred just at the completion of the building, was clerk of the works, Mr. Adams being the builders' foreman.

A Party of Belgian Architects, sculptors, painters, archæologists, and ecclesiastics, members of the Guild of St. Thomas and St. Luke, whose object is to promote the study of Christian art, have come over to England, on a fortnight's tour, with the intention of visiting the principal ecclesiastical cities. On Monday they arrived in Canterbury, and spent several hours in the cathedral, the Dean and the Bishop of Dover acting as *ciceroni*. The party numbers nearly eighty, and includes Professor Reusens, of Louvain; Canon Delbigne, of Brussels; M. Van Henkelom, president of St. Bernlphus Guild, Utrecht; M. Jules Helvig, of Liege; and M. Blancheart, of Ghent. The other places to be visited by the travellers are Rochester, London, Winchester, and Oxford.—*Standard.*

Hydraulic Power.—The Hydraulic Power Company is about to set up a powerful ram in the neighbourhood of Blackfriars Bridge, on the Surrey side, together with engine power to work the force-pump; and from this central hydraulic ram mains under great pressure will extend along such thoroughfares as are likely to afford remunerative patronage for the system. From the mains, of course, smaller pipes will be carried into the premises of those who may require hydraulic force, the charge being based on the actual amount of water discharged from the machine into a meter, at a rate of 4s. per 1,000 gallons. The use to which the power will be mainly applied is the working of lifts and cranes.

Festive.—Messrs. Bangs & Co., builders, of Bow, invited their foremen, some thirty-five in number, to dine with them on Saturday last at Epping, and treated them liberally. Mr. Bangs presided, and Messrs. Anstis, Lambert, and Poston spoke, as very old servants in the firm.——On the same day the clerks and foremen in the employ of Mr. W. Brass, builder, of Old-street, held their first annual cricket match and dinner at the Red Lion Hotel, High Barnet. In the cricket match the clerks were victorious. We chronicle these outings, though similar events are just now so numerous that we can scarcely undertake to mention all of them.

Islington, near Lynn.—A painted window has just been erected in the church, containing the subject of Mary at the Feet of Jesus; and below it, a memorial brass, with the arms of Bagge impaling Keppel. They have been executed by Mr. Taylor, of Berners-street, for Mr. Thomas Bagge, in memory of his wife, who was a descendent of the Earls of Albemarle.

Betchworth.—A memorial reredos has just been erected in this church by Mr. J. R. Corbett, to a near relative. It consists of a carving in [mar]ble, representing the Last Supper, [in] work of red Mansfield stone. The [work] executed by Messrs. Mayer & Co., [Lon]don.

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Building Exhibition for 1883.—A meeting of the exhibitors at the three last exhibitions of building materials held at the Agricultural Hall took place last week at the Cannon-street Hotel, for the purpose of considering a proposal that the next meeting should be held at the Hyde Park Hall, Albert-gate, instead of Islington. Mr. Trickett presided, and explained the objects of the meeting, after which there was a discussion as to the best site for the next exhibition. It was stated that difficulties had arisen which would prevent the Agricultural Hall being used for the purpose, and that Mr. John Black, the promoter of the former exhibitions, had taken the Hyde Park Hall for the next one, at the same time that the Agricultural Hall authorities had decided to hold an exhibition of their own. Ultimately, a committee, consisting of Mr. Black, Mr. Rafferty, and Mr. Shrapnell, were appointed to confer with the Agricultural Hall authorities on the subject, and report to another meeting. Touching this matter, Mr. Philip Shrapnell writes to say that the meeting refused to entertain Mr. Black's proposal for the removal of the exhibition; and the only resolution passed was one appointing a committee of Mr. Black's friends to wait upon the Agricultural Hall Company, for the purpose of endeavouring to induce them to reconsider their decision. In this connexion, we note that a company has recently been registered, whose object is the construction of an Agricultural Hall at Kensington. The building is to have a superficial area of 188,000 ft., or about 60,000 more than the large hall at Islington, so famous for cheese and horse exhibitions.

The Law Memorial, Northampton.—A committee has been formed for the purpose of building an organ-chamber at All Saints' Church, in memory of the late Mr. E. F. Law, architect, Northampton. At its last meeting, the Vicar, who was in the chair, announced that Mr. Hill (the head of the firm of Messrs. Hill & Son, organ builders, London, who rebuilt the organ in All Saints' Church about forty years ago) had been down to see the church and organ, and to give an opinion upon the proposed alteration, and that he had spoken very favourably of it, saying that the tone of the organ would be practically quite as good in the proposed chamber as in the gallery, while it would be much better placed in the chamber for accompanying the musical part of the services. He then reported that he had since received an offer from Mr. Hill to remove the instrument and reconstruct it, doing all necessary alterations and repairs for the sum of 100*l*. Mr. E. Law then produced plans for the construction of an organ-chamber just large enough to hold the organ, the plan involving no further alteration of the present walls of the church than the removal of the glass and stone tracery from the north-west window of the chancel, and the north-east window of the church. This plan was approved of by the committee.

Presidents of Departments, Social Science Congress. — The appointments of presidents of departments for the forthcoming Social Science Congress at Nottingham have now all been made. The following is the list:—President of the association, Mr. George Woodyatt Hastings, M.P.; Department of Jurisprudence, Mr. Henry Fox Bristowe, Q.C., Vice-Chancellor of the Duchy of Lancaster; Repression of Crime Section, Sir John Pope Hennessy; Department of Education, Mr. William Woodall, M.P.; Department of Health, Sir Rutherford Alcock, K.C.B.; Department of Economics, Professor Bonamy Price, M.A.; Department of Art, Mr. George Aitchison, A.R.A.

Finances of the Commissioners of Sewers.—The *City Press* estimates the total liabilities of the Commissioners of Sewers at nearly a million sterling, and remarks that if this be so, it will require about 40,000*l*. a year to pay the interest, and about 20,000*l*. a year to gradually pay off the principal. 60,000*l*. a year means a rate of 4d. in the pound, and how will such an addition to the present amount of the Consolidated Rate be received by the ratepayers?

Metallurgical Science.—A medal and prize of the annual value of twenty guineas at King's College has just been founded by Dr. Siemens, F.R.S., "with the object of stimulating the students of King's College, London, to a high standard of proficiency in metallurgical science." The first award will be made at the end of June 1883.

Monument to the Prince Imperial at Woolwich.—The erection of the monument to the memory of the late Prince Imperial is rapidly approaching completion on the green in front of the Royal Military Academy at Woolwich Common. The larger of the two blocks of polished granite, which will form the pedestal, and on which the statue of the unfortunate Prince will stand, will bear the following inscription:—"Napoleon, Prince Imperial. Born in Paris, March 16, 1856. Killed, fighting in South Africa, June 1, 1879. Gentleman cadet, Royal Military Academy, from November 18, 1872, to February 16, 1875. Erected by upwards of 25,000 officers and men from all branches of her Majesty's forces." The statue will be of bronze, and rather larger than life-size. The granite blocks will also bear four bronze eagles, four wreaths enclosing the letter "N.," and surmounted by a crown and the motto of the Royal Artillery. It is expected that the statue will be unveiled soon after the gentlemen cadets return to the Academy from their summer vacation at the end of September.

The Use of Lime in Coal Mining.—On Monday, a series of interesting experiments took place in the workings of the Wharncliffe Silkstone Collieries, near Sheffield, the object being to test the new method of winning coal by the use of compressed lime instead of blasting powder. The experiments, which were witnessed by the officials of this and other collieries, took place in the Parkgate Seam. A hole about 3 in. in diameter, and 4 ft. deep, was drilled through the solid coal and cleaned out, a perforated iron tube was then inserted, and the lime cartridge 3 in. long, put in. When the lime had been rammed home, and the hole made up, a force-pump was used to inject water into the bottom of the tube. Simultaneously with the injection of water the rending process began, and in thirty minutes about ten tons of coal came down almost in an unbroken mass. Of the whole of the fall, not more than 6 per cent. of the coal was small, a much smaller percentage than under the old system. It is anticipated that compressed lime will eventually supersede the use of blasting powder and thus revolutionise the system of winning coal, greatly, as appears to be likely, conducing to the safety of the miner.

Fires.—Referring to the report in the *Times* of the inquest on the two unfortunate workmen who were killed at the fire at Messrs. Bayley's Cotton Mills, Bolton, on Wednesday last, I venture to suggest a simple method by which a large number of persons may readily leave buildings under similar circumstances. Fires at cotton-mills are rapid, a great source of evil being the staircase, by which the conflagration is conveyed to the various floors, and the operatives at work above where it originated are soon in a panic of great confusion, and on making for the stairs find that means of exit cut off. Many jump from a great height, some slide down the hoist-chain or water-spout. The suggestion I refer to is that iron staples be driven into the walls back and front, from the top to the bottom of the building, so as to form a permanent ladder, and those in danger could easily get out of the different windows on to it, and so make their escape.—CHARLES R. WHITE.

The Will of Mr. George Somers Leigh Clarke, late of 20, Cockspur-street, Pall-mall, architect, and of Walpole, Chislehurst, who died on the 4th ult., was proved on the 29th ult. by Mrs. Louisa Harker Clarke, the widow and acting executrix, the value of the personal estate being over 10,000*l*.

TENDERS

For desks, fittings, and chairs, for the Board-room of the Hove Commissioners, at the New Town-hall, from designs by Mr. Waterhouse, A.R.A.:—

E. Boutcher	£546	0	0
J. T. Chappell	394	2	0
Maple & Co.	384	1	3
Marris & Norton (accepted)	332	16	0

For additions, &c., to girls' school, Hornsey. Mr. E. Martineau, architect:—

Stimpson & Co.	£194	0	0
J. S. King (accepted)	174	0	0

For the conversion of 64 and 66, Atlantic-road, Brixton, into shops. Mr. R. Cruwys, architect, Bank-chambers, 451, Brixton-road:—

Peacock Bros.	£748	0	0
Macey	687	0	0
Burch & Moor	518	0	0
Smart	450	0	0
Tyerman (accepted)	447	0	0
Rodwell	425	0	0

For erecting five houses, Green-walk, Bermondsey New-road, for Mr. J. House. Mr. Alfred Wright, architect, 18, Hayter-road, Brixton-rise:—
H. Burman (accepted).

For alterations and additions to the Vicarage, Froxfield, near Hungerford, for the Rev. R. C. Stiles. Messrs. Webb & Tubb, architects, 1, Blagrave-street, Reading:—

Wooldridge & Son, Hungerford	£1,500	0	0
Phillips & Powell, Swindon	1,450	0	0
Swain, London	1,400	0	0
Woodroffe, Reading	1,387	0	0
Elliot, Newbury	1,296	0	0
Dawson & Son, Beddington	1,267	0	0
Simonds, Reading	1,259	0	0
Wernham, Reading	1,242	0	0
Hoskings & Son, Hungerford	1,230	0	0
Weaver, Reading	1,229	10	0
Holt, Croydon	1,200	0	0
Reavell, Staines	1,196	0	0
Margetts, Reading	1,188	0	0
Denton, Reading	1,135	0	0
Williams, Abingdon	1,096	0	0
Kingerlee, Banbury	980	0	0
Potter, Leicester	899	5	0
Thompson, London	640	0	0

For the erection of house at Melsonby, near Richmond (Yorks), for the Right Hon. the Earl of Zetland. Messrs. Clark & Moscrop, architects:—

W. Shaw	£1,056	17	3
J. Vickers	1,053	4	7
W. Wilson	1,029	4	3
Alex. Thompson	1,020	0	0
W. E. Yent	954	6	8
Watson Bros.	900	0	0
H. Harwood	892	0	0
R. & S. Adamson	889	15	0
G. Scott	879	17	3

For the erection of mission-hall, Loder-street, Bromley-by-Bow, for the Rev. H. L. Paget, and Mr. J. G. Talbot, M.P., Messrs. A. & C. Harston, architects, 15, Leadenhall-street. Quantities supplied:—

Cox	£1,513	0	0
Bangs & Co.	1,500	0	0
Outhwaite & Son	1,443	0	0
Killby	1,440	0	0
Shurmur	1,440	0	0
Holland, Bromley-by-Bow (accepted)	1,423	0	0

For painting, &c., interior infirmary, at Princes-street, St. George-in-the-East, for the Guardians. Messrs. A. & C. Harston, architects:—

Swain	£564	0	0
Smith	545	0	0
Wythe	535	0	0
Moyle & Son	493	0	0
Derby	485	0	0
Coombe & Son	475	0	0
Stevenson	339	0	0
Stewart, Walworth (accepted)	238	0	0

For house at West-end-lane, Kilburn, for Mr. Richard Carr. Mr. Henry John Hanson, architect. Quantities by Mr. Henry Smith:—

Scott	£3,027	0	0
B. Cooke & Co.	2,874	0	0
B. E. Nightingale	2,742	0	0
Dambon (too late)	2,675	0	0
Wm. Smith	2,655	0	0
John Grover	2,640	0	0
J. D. Hobson	2,620	0	0
Lathey Bros.	2,592	0	0
Richens & Mount	2,564	0	0
Gregory	2,550	0	0
Stimpson & Co.	2,546	0	0
Turtle & Appleton	2,440	0	0

For the erection of a Masonic hall at Banbury. Mr. W. E. Mills, architect:—

Kingerlee	£663	0	0
Claridge	659	0	0
Orchard	657	0	0
Davis	635	0	0
Kimberley (accepted)	630	0	0
Heating Apparatus.			
Barford	29	2	6

For alterations and additions to the Brixton Orphanage, Barrington-road. Mr. Alfred Wright, architect, 18, Hayter-road, Brixton-rise:—

Thomas Little	£2,169	0	0
Haward Bros.	2,150	0	0
Crabb & Son	1,987	10	0
John Mursland	1,897	0	0
D. S. Rice	1,894	0	0
Holliday & Greenwood	1,889	0	0
W. Johnson	1,792	0	0

For two new shops and other works, at High-street, Deptford, for Dr. Kavanagh. Mr. W. T. Hunt, jun., architect:—

Lingham	£455	0	0
Hubble & Trott	381	0	0
H. L. Holloway	373	0	0
Mark Redman	365	0	0
Rodwell	353	0	0

For new sewer, Hawkins-street, for the Mile-end Vestry. Mr. John Knight, architect:—

Parrish	£189	0	0
Baxter	180	0	0
Wood	175	0	0
Finch	147	10	0
Croft	135	0	0
Pollard	111	0	0

For the erection of a pair of semi-detached villas, West Hill, Dartford. Mr. R. Cruwys, architect:—
Simons Bros. (accepted).

For the erection of a semi-detached cottage, and alteration to house adjoining, West Hill, Dartford. Mr. R. Cruwys, architect:—
Watson (accepted).

For rebuilding the Olive Branch, Crawford-street, for Mr. Shaw. Mr. W. E. Williams, architect:—

Marr (accepted)	£2,427	0	0

For reinstating, after fire, the Prince Albert, Old Ford-road, for Messrs. Truman, Hanbury, & Buxton:—
Marr (accepted).

For alterations to factory, Fashion-street, for Messrs. Scammell & —
Marr (accepted).

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and bad proportion analogous to that which is illustrated by the relation of the human figure to the forces with which it has to deal. Take a column as an example: the object of a column is to hold a portion of a building aloft; height is a requisite, therefore, to it; a very low and stumpy column would appear as a feature ridiculously falling short of its obvious intention. But stability is also a requisite of the column, as of every part of architecture, and therefore the height must be limited to that which will appear, when regarded in relation to the thickness of the column and to the mass it has to carry, as not too great for perfect stability. Regarding it in this light, we can see that the Parthenon column has a claim to be regarded as better proportioned than that of Corinth or Pæstum; in the latter the appearance of stability is in excess. But any considerably greater height given to the Parthenon column would spoil its proportion by too much reducing stability, in consideration of the massive design of the superstructure. The columns of the Ionic and Corinthian order allow greater height in relation to the width, but the entablature also is lighter. In Gothic architecture an immensely increased tenuity is given to the column (if we regard the vaulting shaft as taking the place of the column), and yet it looks agreeable to the eye, but that is because we know that the whole thing is play; the shaft does not support the weight of the vault, it merely supports, or appears to support, the lines of the ribs. The appearance of a shaft of even half that degree of tenuity relatively to its height, if it were really doing, or appearing to be doing, work, would be unbearable. We can compound with the effect of thin iron columns under a much more massive superstructure of stone; it is not agreeable chiefly because our eyes are accustomed to see stone proportions carried throughout a building, and the thin columns disagreeably clash with the habit of proportion to which the eye has been accustomed; still, we know as a fact that they are stable and equal to their work, and the sense of disproportion can be to some extent got over. Make their surface a complete imitation of stone, and the sense of disproportion would be unbearable.

This sense of statical proportion, more or less, governs visual proportion throughout the building. A shallow architrave, with a deep and heavy frieze, offends our sense of proportion, independently of all habits of taste and all ideas as to mathematical proportion, because we feel that the architrave is not sufficient for its work. The converse, a heavy architrave and a light entablature, is equally offensive to the sense of proportion, the architrave being "disproportionately" heavy for what it has to do. Lighten the architrave proportionately to the frieze, and then we at once find that the column is too massive for the superstructure, and our sense of visual proportion is again offended, for the same reason, because the statical proportions are wrong. And when builders show, as the builders of Beauvais did, a marked want of perception as to proportion, although the visual disproportion might withstand the attacks of criticism, the statical disproportion comes to its aid and compels a readjustment, whether the builders will or no.

This connexion between visual proportion and statical proportion may be exemplified in the utter want of proportion which is to be observed in much semi-barbarous architecture, where, as in many examples in Hindu and Cambodian architecture, the superstructure is out of all proportion to the substructure, and ponderous cupolas are piled up on an insignificant base; and the principle may be traced also in regard to ornamental design. In designs based upon foliage, for example, there must be preserved an apparent proportion of strength between the stems and the ornaments which they carry. A foliage-design in which the stems should be thick and heavy, and the conventional foliage springing from them small and light, would inevitably affect the eye with a disagreeable sense of wrong proportion, and *vice versâ*. It only needs a recognition of the principle to trace its influence continually in discriminating the good or bad qualities of decorative design.

There is, however, another practical consideration having its influence on proportion; one which comes under the head of proportion referable to some outside standard not contained in the structure itself. In regard to architecture this outside standard is the human figure itself. All buildings are erected by human hands for human use in one way or another, and hence the scale of the human figure becomes, in regard to architectural proportion, a kind of "constant," the effect of which must always be taken into account. And here, we may venture to suggest, is perhaps the true explanation of the better effect of some proportions of height, length, and breadth as compared with others. We will not deny that there may be something in the idea that certain geometrical ratios in such dimensions, in interiors, tend to give a better effect than others. But we may suggest that it is quite possible, even probable, that the good effect of such proportions really lies in their relation to the height and proportion of the human figure, and (a point which is seldom taken into account in such speculations) to the visual angle which human vision is capable of including. The capability of grouping of congregations of men so as to be within sight and hearing of each conveniently is another point to be taken into account in the proportioning of interiors. To take a very simple and obvious instance, the proportion and scale of doorways is always tacitly made with some reference to the proportion as well as to the scale of the figure. A wide square doorway would be a very suitable form of entrance to a stable, and in fact, is the form that ought to be adopted, much more often than it is; but every one would feel that an entrance so shaped, whatever its positive scale or size, was relatively of the wrong proportion for an entrance doorway for human beings. However colossal an entrance may be made in point of actual measurements, the instincts of civilised builders have always taught them to preserve in such entrances the usual relation of height to width which has been found the most convenient and suitable for a doorway; and the same instinct influences the general shape of all the openings in buildings, even up to the chancel arch of a large church or cathedral. Buildings are made by and for a race of beings standing upright, not going on the ground or on all fours; and this fact influences, almost without our knowing it, all the proportions of openings in buildings. In the range of angle of our vision, again, we may probably find the secret of the feeling as to proportion of length to breadth, rather than in the mere numerical ratio of measurements considered *per se*. A square room is a bad form, because in a square room the eye can only take in barely one side at a glance, and that only when standing with the back against the opposite wall. A room in the proportion of 3 to 4, or even 4 to 5, allows of one side and part of the return sides being easily seen at a glance, and therefore adapts itself better to the range of vision than a square room. For the same reason, a height which is suitable in a large room is too great for a small room, because the eye cannot then take in the ceiling-line along with the floor-line: the two are beyond the angle of vision. A very low room brings too great a proportion of the floor and ceiling space into the field of view in comparison with the wall space, and thus produces a sense of disproportion, besides being at variance with the demand which upright stature, and the height of the eyes from the ground, creates in favour of a certain elevation in the roof above the eyes. A very long narrow room puts the people and objects at the further end disproportionately far from the eye, and suggests the necessity of movement from one part to the other in order to take it all in; conveying the idea of a passage to move through, rather than a room in which we may conveniently occupy one station.

Thus we may trace in all the proportions of size in an interior, a relation to the scale and movement and power of vision of man, which renders them, to our feeling, well or ill proportioned, according as their proportions are true or not in their relations to ourselves. It may be better to have the length and breadth of a room in an exact ratio to one another; the employment of exact ratios is, at any rate, very much led up to by the mere habit of employing fixed standards of measurement, and renders the subdivision of parts by measurement, in the setting out of details, much simpler by the avoidance of fractions; all which are good substantial reasons in its favour. But that the proportioning of the sides of an apartment according to exact ratios is in itself a chief cause of the appearance of good proportion certainly seem[s] questionable, on the ground that it is a refi[ne]ment which the eye does not really appreciate, and of the existence of which we cannot be certain by mere observation, until actual measurement has proved it to us: whereas the proportion in relation to our movements and to the visual angle of vision we can readily appreciate. And, therefore, if we were required to pin our faith to any geometrical method of making well-proportioned rooms, we should prefer to dwell not on the relative lengths of the walls in measured feet, or modules, or whatever else we like to term them, but on the relation of the proportions to the range of vision, as calculated from the chief probable points of occupation in the room. If we took the proportions in thus calculating the visual angle from one extreme end of the room, no doubt it would practically come to nearly the same thing as setting out the lengths of the walls in certain proportions. But as a room scarcely ever is looked at from the extreme end, the pretence that its good proportion consists in a relation of the lengths of the sides, which are never actually seen by the eye simultaneously, rests on a very doubtful basis; and it seems much more reasonable and logical to suppose that the true key to the problem is the way in which the room would be seen from an ordinary and habitual point of view, and the angle which would be subtended by that portion of the whole design which it is desirable to be able to see in one view.

But there is also the relation between the building and the actual stature and scale of the being who erects it,—the proportion of positive sizes,—to be considered. This is the most obvious and superficial of all the relations between man and architecture, yet it is one the effect of which has often been strangely overlooked, even to a certain extent by such thoughtful artists as the Greeks. The human figure is the scale by which every building is measured, and to which every building is finally referable. Consequently, the average scale of sizes of parts and details which has been determined by reference to those features (such as doors) which are directly influenced by the scale of the figure, cannot be materially altered without creating a confusion or falsification of scale. This is apparent pre-eminently in the case of doorways themselves: a gigantic doorway only deceives the spectator as to the scale, and dwarfs the building, unless it is accompanied by such details as may aid in restoring the scale. The Mediæval architects seem to have been much more conscious of this fact than the Greek architects, inasmuch as, while giving grandeur and dignity to their doorways by immense recessed portals, they nevertheless left the actual and "practicable" doorway in most cases about the average size, so that the scale referable to the figure was preserved. In the Greek temples there is very little idea of scale in this sense. Two temples, of which one is twice the size of the other, present no apparent difference in scale when seen separately in drawings; it is only when a scale or a figure is added that we can say whether the columns are 15 ft. or 30 ft. in height. This is a distinct defect in Greek architecture, and in this respect there is more true feeling for scale shown in the system suggested by the Romans and pursued by so many of the Renaissance architects, of placing one order of average scale over another in a lofty building, instead of increasing the positive size of the order, and with that lessening the relative scale of the building. We ought to be able to tell from the appearance of a building in the drawing about what size it is; the increase of scale being given, not by increasing the scale of parts, but by multiplying parts on the ordinary scale. The opposite process pursued in St. Peter's is what gives rise, of course, to the often-quoted fallacy about its proportions, referred to just now. It is not a design for a colossal building, but a design for a building of average size magnified; and to make its scale appear true we should require men 12 ft. or 14 ft. in height to inhabit it.

To sum up: we conclude that good proportion in a building and its details depends upon a correspondence between visual proportion and statical proportion in the first instance, and a true reference of the whole building to the stature, vision, and movements of man. There are other points which might be regarded as coming under the head of proportion, but which cannot be referred to so decisive a standard. We may mention two of these: one is that [w]hich have different functions should [p]recisely the same length or width,

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should not be identical in dimension. As a single instance, take the case of a column or shaft. Where, as in a Gothic shaft, a band is placed in the centre of the height of the shaft, and the treatment of the surface of the shaft is the same above and below, we feel that the proper place for the band is precisely in the centre of the height. But where we have the upper portion of a column fluted and the lower part plain, for instance, we then feel that the dimensions of the two parts should not be the same,—that the division should not be central; though it is difficult to say why this should be so, and it comes more, perhaps, under the head of the more vague perception of taste than as a question of proportion. Another point is that the predominant character of proportions should be carried out consistently throughout the details of a building; *i.e.*, that if the principal masses of the structure, and their supporting piers, are more than ordinarily massive, this character of massiveness should be consistently carried out through all the details. But this again, though it has a certain bearing on the question of proportion, is hardly to be identified with it, and belongs rather to what may be called in the abstract "character," a quality in design which arises from the consistent treatment of every detail so as to intensify the leading idea of the design, whether that idea be grace or massiveness, energy or repose, brightness or gloom. Such qualities as these, however, can only be felt, not defined; they belong to the region of taste and sentiment. But proportion, although we may question whether it can be reduced, as some think, to a mathematical formula, is nevertheless a quality in design closely connected with practical questions, and with which logic and reason have at least as much to do as taste and artistic perception.

SCIENCE AND PRACTICE AT SOUTHAMPTON.

THE address of Dr. Siemens, as president of the British Association, on August 23rd, deals with topics that have a special interest to many of our readers, as having been not unfrequently handled in our own columns. On most of them we are happy to note the full and unhesitating agreement between the views then expressed by this distinguished physicist and our own. More especially do we refer to his expression in the address of the importance of that solidarity which exists between science and industry, on which we very recently remarked, and to the statement that it is to the union of theory and practice that we owe the rapid progress of the present day; the two orders of men "both merging more and more into one class, that of pioneers in the domain of nature."

We shall not attempt an abstract of an address which is *in extenso* so easily attainable by the reader; but we must, in the first place, express the feeling of disappointment with which we read the reference of Dr. Siemens to one point on which he must be regarded as an authority of the first weight, that of the application of electricity to locomotion. The electric railway, said the President, "possesses great advantages over horse or steam power, for our towns, in tunnels, and in all cases where natural sources of energy, such as waterfalls, are available, but it would not be reasonable to suppose that it will in its present condition compete with steam propulsion upon ordinary railways." We have no choice but to accept this statement, far as it falls short of the brilliant promises to which we have, not so very long ago, listened on this subject. But we do not accept it as the last word of science. Rather, as it appears to us, does it indicate that the method of transmission of the electric force by a continuous rail or overhead wire, as to which we have always had serious doubts, is not a step made in the true direction in which to seek for the solution of the problem of locomotion. What may be done by accumulated force, and the use of secondary batteries, is as yet almost unexplored. Nor do we hold it to be unlikely that the establishment of electric accumulators at proper distances, fed by a continuous current, but able to supply large power on instant demand, may prove to be the key to the problem. The total loss by transmission and reconversion of electric energy (while it may be less) Dr. Siemens thinks it safest to estimate, with Dr. Hopkinson, at 50 per cent. When, however, water-power, tidal force, or any other inexpensive motor is obtainable, the loss of 50 per cent. in transmission becomes comparatively unimportant. We have seen at how great a disadvantage the locomotive works, not only as to the delivery of its power, but also owing to the great weight of the engine itself, the proportionate addition to the weight of the rest of the rolling stock, and the consequent increase in the cost of the whole superstructure of the railway. As to this, Mr. Fowler, in his address to the mechanical section of the association, struck a new but perfectly distinct note, when he said that an ideal railway should have gradients of about one in twenty falling each way from the stations, with a piece of horizontal line connecting them. As to this, however, it must be remarked that such a section would involve a duplication of the entire railway system; the undulating arrangement being applicable to short stages, but altogether inappropriate to such long runs as that of the 186¾ miles from Leeds to London, accomplished a few months ago within three hours, or at a rate of more than sixty-two miles per hour. We may note here, in passing, as confirmatory of some recent remarks of our own, that Mr. Fowler has found that 60 per cent. of the whole power exerted by the engines on the Metropolitan Railway is absorbed by the brakes. This makes the cost of locomotive power for one mile on that line equal to the cost for two miles and a half in such a case as that above cited; and fits, as accurately as may be, with our own estimate of the cost of locomotion on the Metropolitan Railway, per ton mile of loaded train.

Passing from the consideration of the application of electricity to locomotion to that of the use of the same subtle and mighty agent as a stimulant to vegetation (though we thus reverse the order of the address), we find that there is little to be added to the statements of Dr. Siemens's paper on the subject read before Section A last year, to which we called attention at the time, with the exception of the prosecution of further experiments on the cereals. "Towards the end of February, with the first appearance of mild weather, the plants under the influence of an electric light of 4,000-candle power, placed about 5 mètres above the surface, developed with extreme rapidity, so that by the end of May they stood above 4 ft. high, with the ears in full bloom, while those not subjected to the rays of the electric light were under 2 ft. in height, and showed no signs of the ear." It is extraordinary that the statement, by a man who has given such hostages to science, of the action of this magical farmers' friend, has not attracted the efforts of the promoters of companies. It remains, of course, to be seen whether this wonderful quickening of the growth of the individual may be in any way produced at the cost of the race; and whether the seedlings, or the seedlings' seedlings, of electrically-grown wheat and barley would retain all the reproductive energy of wilder grasses. But when we reflect on the immense energy of tropical vegetation, we are inclined to think that the above fear, though by no means to be neglected without trial, may prove to be baseless. And, if so, what a future is before the agriculturist.

In another part of that wide and ample range which is so practically familiar to the President of the Association for the year, another of our frequent topics of discussion was dealt with in language almost identical with our own. Dr. Siemens looks to gas as the fuel of the future. A pound of gas, he told his audience, yields in combustion 22,000 heat units, or exactly double the heat produced in the combustion of a pound of ordinary coal. A pound of coal, however, it must be remembered, will only produce 0·16 lb. of gas, although the value of the by-products of distillation,—tar, coke, ammoniacal liquor, and, if only it were extracted, sulphur,—exceeds the cost of the coal used for gas-making by nearly 60 per cent. The cloudy canopy of London, Dr. Siemens states, on the estimate of Professor Roberts, contains in a winter's day 50 tons of soot; that is to say, of comminuted carbon, and five times that weight of carbonic oxide. The use of gas for all heating purposes, we hold with Dr. Siemens, is one of the promises of the future, the delay in the accomplishment of which is somewhat unaccountable; and we further agree that the distillation will probably hereafter be effected in the mine, the gas being sent by pipes from the bottom of the shaft, so that it would be only the tar, coke, and other by-products that would have to be raised mechanically through the shaft.

The triumphs which Dr. Siemens has already won over matter, in so many provinces of its wide-spread and diversified realm, have perhaps exposed him to the noble and unusual fault of being too ready to give credence to anticipations, more brilliant than solid, in departments less familiar to his footsteps. Thus, he says that the estimated cost of the Panama Canal is 20,000,000*l.*, and that more than this sum having been subscribed, it appears unlikely that political or climatic difficulties will stop M. de Lesseps in its speedy accomplishment. A communication lately made to the Société des Ingénieurs Civils, at Paris, by M. Hersent, one of the warmest supporters of M. de Lesseps, gives a very different outlook. Down to May last the clearance of timber and brushwood from about half the track of the projected canal is all that M. Hersent can point to in the way of preparation for actual working, with the exception of borings, soundings, the erection of sheds and hospitals, the purchase of materials, and other such-like preliminary work, involving the movement of a total quantity of earthwork equal to about the contents of a yard run of the deepest cutting shown on the section. Out of 287 Europeans despatched to Panama since January, 1881, "for the service of the survey and of the works," 39 per cent. were either dead or had fled the spot in thirteen months,—a numeric statement which fairly tallies with the last accounts of the desertion of the locality in troops by the intended labourers. And the estimated cost is not 20,000,000*l.*, but more than 40,000,000*l.* The capital of the company, as constituted, is 12,000,000*l.*, and half of it has been already called up. Nor, as far as we have seen, have any nautical men failed to ridicule the idea of the rival project of a ship railway, "to take the largest vessel, fully laden and equipped, from sea to sea, over a gigantic railway across the Isthmus of Tehuantepec, a distance of 95 miles." As to these matters, the civil engineer, the naval engineer, and the prudent man of business, alike shake their heads. Have we so far exhausted the practical that we should rush after the purely visionary?

The student of science suffers, on occasions like the present, under something of the *embarras des richesses*, when so many eminent men, within such narrow limits of time and of space, do their best to give a brilliant *résumé* of the condition of those branches of science with which they are severally most familiar. And it is a striking proof of the advance of science, and of the constant specialisation and sub-division to which that advance subjects the general conception, to find two such addresses as those of Dr. Siemens and Mr. Fowler, each dealing with pressing questions of the engineering of the day; each in itself full and lucid, and yet in no way overlapping one another.

The references made by Mr. Fowler to the Channel passage,—a matter to which he has long devoted special attention,—have much value at this time. It is due, not to any defect on the part of the naval engineer, but to the neglect of the harbour capabilities of the French coast, that the state of the steam ferry across the Channel is such as to allow the idea of the construction of a more costly, more dangerous, and far more personally disagreeable mode of communication to be even mentioned without a smile. To this great defect the French Government is now engaged in providing a remedy. Nor do we doubt that a few years will witness the provision of so swift, steady, and healthful a mode of steam ferry that very few persons would hesitate to use it in preference to a choky tunnel of twenty-eight miles long, were such a useless tube actually constructed. As to goods, the cost by sea is less than one-third of that possible by railway, even apart from the enormous dues that would be requisite to pay for the construction and maintenance of a tunnel.

In compensation for that increase of special knowledge to which we referred, as limiting the amount of information within the grasp of the individual student, we have, however, to note that rapid increase in the electric communication, so to speak, of thought between departments the most widely distinct, to which the general advance is, perhaps, mainly due. Thus the improvements in the manufacture of steel directly affect the prospects of navigation, and will not be unfelt in any branch of industry. And the humble investigations which have been undertaken in order to discover what are the cheapest methods for illuminating

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and bad proportion analogous to that which is illustrated by the relation of the human figure to the forces with which it has to deal. Take a column as an example: the object of a column is to hold a portion of a building aloft; height is a requisite, therefore, to it; a very low and stumpy column would appear as a feature ridiculously falling short of its obvious intention. But stability is also a requisite of the column, as of every part of architecture, and therefore the height must be limited to that which will appear, when regarded in relation to the thickness of the column and to the mass it has to carry, as not too great for perfect stability. Regarding it in this light, we can see that the Parthenon column has a claim to be regarded as better proportioned than that of Corinth or Pæstum; in the latter the appearance of stability is in excess. But any considerably greater height given to the Parthenon column would spoil its proportion by too much reducing stability, in consideration of the massive design of the superstructure. The columns of the Ionic and Corinthian order allow greater height in relation to the width, but the entablature also is lighter. In Gothic architecture an immensely increased tenuity is given to the column (if we regard the vaulting shaft as taking the place of the column), and yet it looks agreeable to the eye, but that is because we know that the whole thing is play; the shaft does not support the weight of the vault, it merely supports, or appears to support, the lines of the ribs. The appearance of a shaft of even half that degree of tenuity relatively to its height, if it were really doing, or appearing to be doing, work, would be unbearable. We can compound with the effect of thin iron columns under a much more massive superstructure of stone; it is not agreeable chiefly because our eyes are accustomed to see stone proportions carried throughout a building, and the thin columns disagreeably clash with the habit of proportion to which the eye has been accustomed; still, we know as a fact that they are stable and equal to their work, and the sense of disproportion can be to some extent got over. Make their surface a complete imitation of stone, and the sense of disproportion would be unbearable.

This sense of statical proportion, more or less, governs visual proportion throughout the building. A shallow architrave, with a deep and heavy frieze, offends our sense of proportion, independently of all habits of taste and all ideas as to mathematical proportion, because we feel that the architrave is not sufficient for its work. The converse, a heavy architrave and a light entablature, is equally offensive to the sense of proportion, the architrave being "disproportionately" heavy for what it has to do. Lighten the architrave proportionately to the frieze, and then we at once find that the column is too massive for the superstructure, and our sense of visual proportion is again offended, for the same reason, because the statical proportions are wrong. And when builders show, as the builders of Beauvais did, a marked want of perception as to proportion, although the visual disproportion might withstand the attacks of criticism, the statical disproportion comes to its aid and compels a readjustment, whether the builders will or no.

This connexion between visual proportion and statical proportion may be exemplified in the utter want of proportion which is to be observed in much semi-barbarous architecture, where, as in many examples in Hindu and Cambodian architecture, the superstructure is out of all proportion to the substructure, and ponderous cupolas are piled up on an insignificant base; and the principle may be traced also in regard to ornamental design. In designs based upon foliage, for example, there must be preserved an apparent proportion of strength between the stems and the ornaments which they carry. A foliage-design in which the stems should be thick and heavy, and the conventional foliage springing from them small and light, would inevitably affect the eye with a disagreeable sense of wrong proportion, and *vice versâ*. It only needs a recognition of the principle to trace its influence continually in discriminating the good or bad qualities of decorative design.

There is, however, another practical consideration having its influence on proportion; one which comes under the head of proportion referable to some outside standard not contained in the structure itself. In regard to architecture this outside standard is the human figure itself. All buildings are erected by human hands for human use in one way or another, and hence the scale of the human figure becomes, in regard to architectural proportion, a kind of "constant," the effect of which must always be taken into account. And here, we may venture to suggest, is perhaps the true explanation of the better effect of some proportions of height, length, and breadth as compared with others. We will not deny that there may be something in the idea that certain geometrical ratios in such dimensions, in interiors, tend to give a better effect than others. But we may suggest that it is quite possible, even probable, that the good effect of such proportions really lies in their relation to the height and proportion of the human figure, and (a point which is seldom taken into account in such speculations) to the visual angle which human vision is capable of including. The capability of grouping of congregations of men so as to be within sight and hearing of each conveniently is another point to be taken into account in the proportioning of interiors. To take a very simple and obvious instance, the proportion and scale of doorways is always tacitly made with some reference to the proportion as well as to the scale of the figure. A wide square doorway would be a very suitable form of entrance to a stable, and in fact, is the form that ought to be adopted, much more often than it is; but every one would feel that an entrance so shaped, whatever its positive scale or size, was relatively of the wrong proportion for an entrance doorway for human beings. However colossal an entrance may be made in point of actual measurements, the instincts of civilised builders have always taught them to preserve in such entrances the usual relation of height to width which has been found the most convenient and suitable for a doorway; and the same instinct influences the general shape of all the openings in buildings, even up to the chancel arch of a large church or cathedral. Buildings are made by and for a race of beings standing upright, not going on the ground or on all fours; and this fact influences, almost without our knowing it, all the proportions of openings in buildings. In the range of angle of our vision, again, we may probably find the secret of the feeling as to proportion of length to breadth, rather than in the mere numerical ratio of measurements considered *per se*. A square room is a bad form, because in a square room the eye can only take in barely one side at a glance, and that only when standing with the back against the opposite wall. A room in the proportion of 3 to 4, or even 4 to 5, allows of one side and part of the return sides being easily seen at a glance, and therefore adapts itself better to the range of vision than a square room. For the same reason, a height which is suitable in a large room is too great for a small room, because the eye cannot then take in the ceiling-line along with the floor-line: the two are beyond the angle of vision. A very low room brings too great a proportion of the floor and ceiling space into the field of view in comparison with the wall space, and thus produces a sense of disproportion, besides being at variance with the demand which upright stature, and the height of the eyes from the ground, creates in favour of a certain elevation in the roof above the eyes. A very long narrow room puts the people and objects at the further end disproportionately far from the eye, and suggests the necessity of movement from one part to the other in order to take it all in; conveying the idea of a passage to move through, rather than a room in which we may conveniently occupy one station.

Thus we may trace in all the proportions of size in an interior, a relation to the scale and movement and power of vision of man, which renders them, to our feeling, well or ill proportioned, according as their proportions are true or not in their relations to ourselves. It may be better to have the length and breadth of a room in an exact ratio to one another; the employment of exact ratios is, at any rate, very much led up to by the mere habit of employing fixed standards of measurement, and renders the subdivision of parts by measurement, in the setting out of details, much simpler by the avoidance of fractions; all which are good substantial reasons in its favour. But that the proportioning of the sides of an apartment according to exact ratios is in itself a chief cause of the appearance of good proportion certainly seems questionable, on the ground that it is a refinement which the eye does not really appreciate, and of the existence of which we cannot be certain by mere observation, until actual measurement has proved it to us: whereas the proportion in relation to our movements and to the visual angle of vision we can readily appreciate. And, therefore, if we were required to pin our faith to any geometrical method of making well-proportioned rooms, we should prefer to dwell not on the relative lengths of the walls in measured feet, or modules, or whatever else we like to term them, but on the relation of the proportions to the range of vision, as calculated from the chief probable points of occupation in the room. If we took the proportions in thus calculating the visual angle from one extreme end of the room, no doubt it would practically come to nearly the same thing as setting out the lengths of the walls in certain proportions. But as a room scarcely ever is looked at from the extreme end, the pretence that its good proportion consists in a relation of the lengths of the sides, which are never actually seen by the eye simultaneously, rests on a very doubtful basis; and it seems much more reasonable and logical to suppose that the true key to the problem is the way in which the room would be seen from an ordinary and habitual point of view, and the angle which would be subtended by that portion of the whole design which it is desirable to be able to see in one view.

But there is also the relation between the building and the actual stature and scale of the being who erects it,—the proportion of positive sizes,—to be considered. This is the most obvious and superficial of all the relations between man and architecture, yet it is one the effect of which has often been strangely overlooked, even to a certain extent by such thoughtful artists as the Greeks. The human figure is the scale by which every building is measured, and to which every building is finally referable. Consequently, the average scale of sizes of parts and details which has been determined by reference to those features (such as doors) which are directly influenced by the scale of the figure, cannot be materially altered without creating a confusion or falsification of scale. This is apparent pre-eminently in the case of doorways themselves: a gigantic doorway only deceives the spectator as to the scale, and dwarfs the building, unless it is accompanied by such details as may aid in restoring the scale. The Mediæval architects seem to have been much more conscious of this fact than the Greek architects, inasmuch as, while giving grandeur and dignity to their doorways by immense recessed portals, they nevertheless left the actual and "practicable" doorway in most cases about the average size, so that the scale referable to the figure was preserved. In the Greek temples there is very little idea of scale in this sense. Two temples, of which one is twice the size of the other, present no apparent difference in scale when seen separately in drawings; it is only when a scale or a figure is added that we can say whether the columns are 15 ft. or 30 ft. in height. This is a distinct defect in Greek architecture, and in this respect there is more true feeling for scale shown in the system suggested by the Romans and pursued by so many of the Renaissance architects, of placing one order of average scale over another in a lofty building, instead of increasing the positive size of the order, and with that lessening the relative scale of the building. We ought to be able to tell from the appearance of a building in the drawing about what size it is; the increase of scale being given, not by increasing the scale of parts, but by multiplying parts on the ordinary scale. The opposite process pursued in St. Peter's is what gives rise, of course, to the often-quoted fallacy about its proportions, referred to just now. It is not a design for a colossal building, but a design for a building of average size magnified; and to make its scale appear true we should require men 12 ft. or 14 ft. in height to inhabit it.

To sum up: we conclude that good proportion in a building and its details depends upon a correspondence between visual proportion and statical proportion in the first instance, and a true reference of the whole building to the stature, vision, and movements of man. There are other points which might be regarded as coming under the head of proportion, but which cannot be referred to so decisive a standard. We may mention two of these: one is that portions which have different functions should not repeat precisely the same length or width,

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should not be identical in dimension. As a single instance, take the case of a column or shaft. Where, as in a Gothic shaft, a band is placed in the centre of the height of the shaft, and the treatment of the surface of the shaft is the same above and below, we feel that the proper place for the band is precisely in the centre of the height. But where we have the upper portion of a column fluted and the lower part plain, for instance, we then feel that the dimensions of the two parts should not be the same,—that the division should not be central; though it is difficult to say why this should be so, and it comes more, perhaps, under the head of the more vague perception of taste than as a question of proportion. Another point is that the predominant character of proportions should be carried out consistently throughout the details of a building; *i.e.*, that if the principal masses of the structure, and their supporting piers, are more than ordinarily massive, this character of massiveness should be consistently carried out through all the details. But this again, though it has a certain bearing on the question of proportion, is hardly to be identified with it, and belongs rather to what may be called in the abstract "character," a quality in design which arises from the consistent treatment of every detail so as to intensify the leading idea of the design, whether that idea be grace or massiveness, energy or repose, brightness or gloom. Such qualities as these, however, can only be felt, not defined; they belong to the region of taste and sentiment. But proportion, although we may question whether it can be reduced, as some think, to a mathematical formula, is nevertheless a quality in design closely connected with practical questions, and with which logic and reason have at least as much to do as taste and artistic perception.

SCIENCE AND PRACTICE AT SOUTHAMPTON.

THE address of Dr. Siemens, as president of the British Association, on August 23rd, deals with topics that have a special interest to many of our readers, as having been not unfrequently handled in our own columns. On most of them we are happy to note the full and unhesitating agreement between the views then expressed by this distinguished physicist and our own. More especially do we refer to his expression in the address of the importance of that solidarity which exists between science and industry, on which we very recently remarked, and to the statement that it is to the union of theory and practice that we owe the rapid progress of the present day; the two orders of men "both merging more and more into one class, that of pioneers in the domain of nature."

We shall not attempt an abstract of an address which is *in extenso* so easily attainable by the reader; but we must, in the first place, express the feeling of disappointment with which we read the reference of Dr. Siemens to one point on which he must be regarded as an authority of the first weight, that of the application of electricity to locomotion. The electric railway, said the President, "possesses great advantages over horse or steam power, for our towns, in tunnels, and in all cases where natural sources of energy, such as waterfalls, are available, but it would not be reasonable to suppose that it will in its present condition compete with steam propulsion upon ordinary railways." We have no choice but to accept this statement, far as it falls short of the brilliant promises to which we have, not so very long ago, listened on this subject. But we do not accept it as the last word of science. Rather, as it appears to us, does it indicate that the method of transmission of the electric force by a continuous rail or overhead wire, as to which we have always had serious doubts, is not a step made in the true direction in which to seek for the solution of the problem of locomotion. What may be done by accumulated force, and the use of secondary batteries, is as yet almost unexplored. Nor do we hold it to be unlikely that the establishment of electric accumulators at proper distances, fed by a continuous current, but able to supply large power on instant demand, may prove to be the key to the problem. The total loss by transmission and reconversion of electric energy (while it may be less) Dr. Siemens thinks it safest to estimate, with Dr. Hopkinson, at 50 per cent. When, however, water-power, tidal force, or any other inexpensive motor is obtainable, the loss of 50 per cent. in transmission becomes comparatively unimportant. We have seen at how great a disadvantage the locomotive works, not only as to the delivery of its power, but also owing to the great weight of the engine itself, the proportionate addition to the weight of the rest of the rolling stock, and the consequent increase in the cost of the whole superstructure of the railway. As to this, Mr. Fowler, in his address to the mechanical section of the association, struck a new but perfectly distinct note, when he said that an ideal railway should have gradients of about one in twenty falling each way from the stations, with a piece of horizontal line connecting them. As to this, however, it must be remarked that such a section would involve a duplication of the entire railway system; the undulating arrangement being applicable to short stages, but altogether inappropriate to such long runs as that of the 186¾ miles from Leeds to London, accomplished a few months ago within three hours, or at a rate of more than sixty-two miles per hour. We may note here, in passing, as confirmatory of some recent remarks of our own, that Mr. Fowler has found that 60 per cent. of the whole power exerted by the engines on the Metropolitan Railway is absorbed by the brakes. This makes the cost of locomotive power for one mile on that line equal to the cost for two miles and a half in such a case as that above cited; and fits, as accurately as may be, with our own estimate of the cost of locomotion on the Metropolitan Railway, per ton mile of loaded train.

Passing from the consideration of the application of electricity to locomotion to that of the use of the same subtle and mighty agent as a stimulant to vegetation (though we thus reverse the order of the address), we find that there is little to be added to the statements of Dr. Siemens's paper on the subject read before Section A last year, to which we called attention at the time, with the exception of the prosecution of further experiments on the cereals. "Towards the end of February, with the first appearance of mild weather, the plants under the influence of an electric light of 4,000-candle power, placed about 5 mètres above the surface, developed with extreme rapidity, so that by the end of May they stood above 4 ft. high, with the ears in full bloom, while those not subjected to the rays of the electric light were under 2 ft. in height, and showed no signs of the ear." It is extraordinary that the statement, by a man who has given such hostages to science, of the action of this magical farmers' friend, has not attracted the efforts of the promoters of companies. It remains, of course, to be seen whether this wonderful quickening of the growth of the individual may be in any way produced at the cost of the race; and whether the seedlings, or the seedlings' seedlings, of electrically-grown wheat and barley would retain all the reproductive energy of wilder grasses. But when we reflect on the immense energy of tropical vegetation, we are inclined to think that the above fear, though by no means to be neglected without trial, may prove to be baseless. And, if so, what a future is before the agriculturist.

In another part of that wide and ample range which is so practically familiar to the President of the Association for the year, another of our frequent topics of discussion was dealt with in language almost identical with our own. Dr. Siemens looks to gas as the fuel of the future. A pound of gas, he told his audience, yields in combustion 22,000 heat units, or exactly double the heat produced in the combustion of a pound of ordinary coal. A pound of coal, however, it must be remembered, will only produce 0·16 lb. of gas, although the value of the by-products of distillation,—tar, coke, ammoniacal liquor, and, if only it were extracted, sulphur,—exceeds the cost of the coal used for gas-making by nearly 60 per cent. The cloudy canopy of London, Dr. Siemens states, on the estimate of Professor Roberts, contains in a winter's day 50 tons of soot; that is to say, of comminuted carbon, and five times that weight of carbonic oxide. The use of gas for all heating purposes, we hold with Dr. Siemens, is one of the promises of the future, the delay in the accomplishment of which is somewhat unaccountable; and we further agree that the distillation will probably hereafter be effected in the mine, the gas being sent by pipes from the bottom of the shaft, so that it would be only the tar, coke, and other by-products that would have to be raised mechanically through the shaft.

The triumphs which Dr. Siemens has already won over matter, in so many provinces of its wide-spread and diversified realm, have perhaps exposed him to the noble and unusual fault of being too ready to give credence to anticipations, more brilliant than solid, in departments less familiar to his footsteps. Thus, he says that the estimated cost of the Panama Canal is 20,000,000*l.*, and that more than this sum having been subscribed, it appears unlikely that political or climatic difficulties will stop M. de Lesseps in its speedy accomplishment. A communication lately made to the Société des Ingénieurs Civils, at Paris, by M. Hersent, one of the warmest supporters of M. de Lesseps, gives a very different outlook. Down to May last the clearance of timber and brushwood from about half the track of the projected canal is all that M. Hersent can point to in the way of preparation for actual working, with the exception of borings, soundings, the erection of sheds and hospitals, the purchase of materials, and other such-like preliminary work, involving the movement of a total quantity of earthwork equal to about the contents of a yard run of the deepest cutting shown on the section. Out of 287 Europeans despatched to Panama since January, 1881, "for the service of the survey and of the works," 39 per cent. were either dead or had fled the spot in thirteen months,—a numeric statement which fairly tallies with the last accounts of the desertion of the locality in troops by the intended labourers. And the estimated cost is not 20,000,000*l.*, but more than 40,000,000*l.* The capital of the company, as constituted, is 12,000,000*l.*, and half of it has been already called up. Nor, as far as we have seen, have any nautical men failed to ridicule the idea of the rival project of a ship railway, "to take the largest vessel, fully laden and equipped, from sea to sea, over a gigantic railway across the Isthmus of Tehuantepec, a distance of 95 miles." As to these matters, the civil engineer, the naval engineer, and the prudent man of business, alike shake their heads. Have we so far exhausted the practical that we should rush after the purely visionary?

The student of science suffers, on occasions like the present, under something of the *embarras des richesses*, when so many eminent men, within such narrow limits of time and of space, do their best to give a brilliant *résumé* of the condition of those branches of science with which they are severally most familiar. And it is a striking proof of the advance of science, and of the constant specialisation and sub-division to which that advance subjects the general conception, to find two such addresses as those of Dr. Siemens and Mr. Fowler, each dealing with pressing questions of the engineering of the day; each in itself full and lucid, and yet in no way overlapping one another.

The references made by Mr. Fowler to the Channel passage,—a matter to which he has long devoted special attention,—have much value at this time. It is due, not to any defect on the part of the naval engineer, but to the neglect of the harbour capabilities of the French coast, that the state of the steam ferry across the Channel is such as to allow the idea of the construction of a more costly, more dangerous, and far more personally disagreeable mode of communication to be even mentioned without a smile. To this great defect the French Government is now engaged in providing a remedy. Nor do we doubt that a few years will witness the provision of so swift, steady, and healthful a mode of steam ferry that very few persons would hesitate to use it in preference to a choky tunnel of twenty-eight miles long, were such a useless tube actually constructed. As to goods, the cost by sea is less than one-third of that possible by railway, even apart from the enormous dues that would be requisite to pay for the construction and maintenance of a tunnel.

In compensation for that increase of special knowledge to which we referred, as limiting the amount of information within the grasp of the individual student, we have, however, to note that rapid increase in the electric communication, so to speak, of thought between departments the most widely distinct, to which the general advance is, perhaps, mainly due. Thus the improvements in the manufacture of steel directly affect the prospects of navigation, and will not be unfelt in any branch of industry. And the humble investigations which have been undertaken in order to discover what are the best and the cheapest methods for illuminating

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and for warming our houses, shops, factories, and streets, have sprung at one vast leap to the orb of the sun, and are now engaged on the problem whether the absorption of the actinic rays due to the energy of that mighty planetary centre occurs in the solar or in the terrestrial vicinity, or, as Captain Abney considers, "somewhere between the solar and the terrestrial atmospheres."

STRICTURES ON STORIES.

A STUDENT may sometimes not unremuneratively employ his time in devoting careful attention to a set of the most unsatisfactory compositions of a particular class that he can bring into comparison. An example which is purely repulsive in every respect will conduct to as little edification as delight when taken by itself, but when collated with another which has some redeeming characteristic, it brings this into relief and directs attention to the points at which nature, that most truly abhors vacuity of expression, is ready to develope beauty if art and reflection will only do justice to their share of responsibility. Such an opportunity is not wanting for those whose habitual route carries them through such streets as Gloucester-place or the Harley-street, of which the name recals the heiress of Queen Anne's minister. What flowers are to be found, what honey to be gathered, in this architectural wilderness, which seems almost too barren to root a weed? If we look out and ponder as we pass along, the walk may not be uninstructive. The original blankness has provoked some later protests, some struggles, however often futile and ill-directed, to obtain relief. After a few such courses of observation we may appreciate the seriousness, as regards architectural fitness and effect, of an omission which is all but universal in street after street, mile after mile, of domestic habitations in London, but chargeable also on many compositions which put themselves forward as studied and finished, as exemplars of elegant and even noble style.

When a dwelling has to be foregone altogether, or else run up in the most economical fashion which is consistent with stability and endurance as weathertight, there is no more to be said, but in cases where it appears that expense is lavished on internal spaciousness and decoration, while neither care nor expense has been bestowed to alleviate what must be an obtrusive hideousness for generations who have to pass the exterior, perforce, and cannot help seeing it, not only our artistic but our moral sensibilities rebel. The suggestion of the unsympathetic and unsociable is oppressive, and as justly to be resented, if it were worth while to give way to resentment, as the more actively offensive parade of vulgarity in overdone ornament. Many great mansions are there in the London bequeathed to us by our ancestors, which have all the characteristics within of noble mansions, but that are as bald and unrelieved without as any stretch of more moderate dwellings in Welbeck-street or Wimpole-street. Let us give attention to one point of failure which is common and more excusable here, but by its very undisguised grossness directs us to consider how far the same flaw is a drawback to the consistency and dignity of far more pretentious structures. What is in question is the incongruousness of false exterior indication of stories or omission of any such indication at all. It requires all our appreciation of the beauty of the composition to excuse the solecism, which has been justly pointed out in the Banqueting Hall of Inigo Jones, that what is one room internally is made to look on the exterior as if it were in two stories. Conversely, in the buildings which we are now concerned with, they might for anything that is shown exteriorly, consist of one single apartment from line of door-step to parapet. It is only in certain cases that balconies to the drawing-room windows give intermittent assurance of a floor-line; it is, again, only in certain cases that a flat band gives one indication of a line of floor somewhere above; in any case whether this is introduced below the windows of the second story, or the still higher story is left as too insignificant to be allowed such an acknowledgment, for anything that is shown by external sign two ranges of windows light a single story. It is true that we know very well that they do not; we are too familiar with the regulation interiors to require information on the point, to be misled by its failure. But the artistic purpose which underlies such indications is not in any case direct information, but indirect significance; an artist insists on an expressive feature not to solve a difficulty but to satisfy a sentiment. When the windows of the chief story have elaborate dressings and are crowned by pediments, as at Somerset House, they occasionally approach the small windows above them so nearly that these, comparatively insignificant as they are, do not suggest the thought of another story, but may possibly pass for mere upper lights of a colossal apartment. If this deception can really be made effectual, there is no doubt that a considerable degree of dignity is gained; but the gain, like other illicit gains, is at the cost of severe sacrifice in other directions, and, moreover, is precarious; it were better sought for by a more legitimate stratagem, which is not far to seek. It seems to be with some intention of adding dignity to a principal story by robbing that above it, that a line of mouldings, sometimes even approaching the importance of a cornice, is observed to be occasionally formed by a continuation of those of the sills of the upper windows. But "the stern avenger" of outraged equity "is behind"; and not far or long behind. The upper story accepts its acknowledgment as a story, as an individuality; but the exaggeration of its line of window-sill does not compensate for the entire suppression of its true line of floor. If the most strongly-pronounced line has a pretension to mean anything, it will tell as meaning that floor and sill are coincident, be the consequences to convenience what they may.

In the Strozzi Palace at Florence, where the sills of each of the upper stories are united by bold string-courses, these do really represent the lines of the floors, but from the height and dimensions of the windows it seems quite consistent that this should be so. Many of the palaces at Genoa give excellent examples of frank recognition of the division of stories by simple bands of progressively-graduated breadth according to height, with very slight projection. Suppression of this distinct intimation of condition of occupancy, involves forfeiture of a grace which is worth conserving, — the expressive gradation of dignities between various horizontal divisions of the structure. Of course, the gradation will not easily be graceful if graceful propriety does not exist in the characteristic purpose which ultimately dictates the application and distribution of space. If a mezzanine over a ground-floor is pinched to the dimensions of a loft, the best course to be taken is certainly to conceal the fact that it is a distinct story, if that be possible; the same course will recommend itself if attics are to be no better than cock-lofts. But architecture asks for better employment than taxing invention for schemes to mask the mean and the unbecoming, and to hide away vulgarity under an ill-fitted veneer of dignity and decorousness. The local habitations which it is its pleasure and privilege to provide are understood as required to harmonise with the circumstances and requirements of inmates of well-balanced dispositions and appreciative of consistency. In many of the Venetian palaces, while the ground-floor is manifestly given up to the utilitarian purposes, of the merchant princes, the *piano nobile* above it is scarcely distinguished in dignity, as in the Pesaro, from that above it; much of the charm of gradation is in consequence wanting; but no inconsistency is involved, inasmuch as the magnitude and splendour of the structure suggests that there must naturally and easily be quite ample secondary and subservient accommodation out of sight. But in too many Italian façades, not those of Palladio exclusively, there is a very harsh transition, indeed, from openings which are suggestive of airiness and magnificence to others close above or close below them of such depressed and confined proportions as to suggest not only contrasted condition of the respective inmates, but their inconsistent and unpleasant proximity.

The acceptance of the principle that stories are to be allowed expression exteriorly, by no means necessitates a frittering of effect. We have only more favourably at command the resource of harmonious gradation of forms and dimensions, and dignities. But gradations must be sufficiently distinct to pronounce themselves if monotony is to be avoided; and bold as they may on occasion be, they must not be overbold, must not be violent, if diversity is not to lapse into discord. The Italian palaces alluded to constantly offend by harsh conjunction of unduly contrasted features, even in compositions which contain so much that is admirable that a critic often finds himself hastening to overlook or forget such imperfections, and disposed to sacrifice conscience rather than spoil pleasure. But justice must take its course, and a just sense of harmony rebels against the intimate companionship of windows stately and elegant, with such openings as even the best Italian architects constantly ranged with them, and often below the same cornice. It may be that herein the architecture gave a true reflection of the habits of a society which strained resources to the utmost to vie in splendour of public receptions and festive assemblies, and submitted willingly to cramped accommodation in private apartments, and had no consideration at all for the miserably confined lodgings of dependents; but this agreement does not make the architecture any more worthy of imitation than is the society in respect of such deep-seated discords. The architectural discord is peculiarly offensive when associated windows are not only contrasted by meanness in dimensions and absence of ornament, but have the difference in form which is equivalent to a rude contradiction. We turn from one design of Palladio to another to be offended as by a wrench in progress from one window of the appropriate erect oblong form, to another above it, which shows as an oblong laid on its side, and sometimes of dimensions that would appear to reduce it to a peep-hole. Such a form would be disagreeable even for a window so large as manifestly to preclude apprehension of an inconvenient lowness of the apartment it pertained to. The unpleasantness is seriously aggravated when no indication of a line of floor sets us at rest as to the relative height of those who should look out of the window; but this is not the limit of aggravation, of compound aggravation; these objectionable forms of windows are sometimes inserted in an attic above an order, where they bring us near other suggestions of discomfort in the slope of a roof; or they are inserted incongruously in a frieze under a cornice. In the Library of St. Mark at Venice we have such flat openings, only with rounded corners, inserted in the frieze over an otherwise noble composition, and their form, dimensions, and position alike make us shrink from even a conjecture as to what may be their relation to apartments in the interior.

Harmonious gradation, therefore, in avoidance of violent, of screaming, contrasts in magnitudes or forms, must be studied if well-defined stories are to be effectively combined; and the skilful grouping of stories,—the indication of two or more as having some special relations,—is still another resource for conferring unity and concentration upon a design which, otherwise from limitation of its features, gives little scope for variety. The leading principle of such grouping must needs be the expressive indication of the immediate or remoter relations of different stories, whether in immediate sequence or not, in respect of dignity. The topmost story and basement may thus be shown as correlative and the others as connected. In a mansion, a residence of importance, where the urban restrictions of the ground-plan do not come into consideration, the problem is simplified, as offices and all appurtenant apartments can be kept out of sight or treated separately, and there is no need to consider how a park or garden front is to be kept in countenance under the incongruous intrusion of windows in a basement.

But when the conditions of a metropolis,—at least, such a metropolis as London,—are to be dealt with, the case is altered, whether the design of a moderate dwelling-house is in question or that of a noble mansion, a public office or a clubhouse. The ordinary dwelling-house presents the problem in its most frequent as in its typical aspect. The question of the architecture of flats is becoming urgent; but, for the present, an Englishman's house is his castle, or, as some have said, is his island, by mere continuation of the insular instincts of his geographical situation. And the domestic systems which animate these settlements are very uniform in general type, and their characteristics have tended to mould a material envelope on the same prevailing pattern. In place of moat or channel there is the defensive area, and this, when liberally spaced in large structures and screened by balustrade or solid parapet, gives an admirable base line; it also houses the offices in happy contrast to the ground-floors or basements of Italian palaces,

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with their windows protected by repulsive grilles or openings recipient of all dust and ordure from the immediate common level of the roadway. The ground-floor is then raised so high as to frustrate prying inlook, provides hall and dining-room, study or library or business room, and handsome access to the floor above; here, in due light and elevation, come reception rooms and elegant retirements; above, again, are the superior bedrooms, baths, &c.; over these the domain of the young,—nurseries, schoolrooms, rooms for piano practice; and, lastly, over all, the rooms of the female servants, and space to spare.

How, then, shall systems of stories such as these prove susceptible of grouping exteriorly with propriety and effect? A gradation in heights is naturally suggested by successive purposes; the true difficulty seems always to be encountered in the management of the topmost, but in truth the least esteemed, story. Yet, least esteemed as it may be, it is in possession of a place which of necessity brings it conspicuously into evidence. Constantly we find it so treated as if only tolerated at all under compulsion, and making itself all the more obtrusively offensive, as if resentful of such treatment. Who can look up at Hope House, in Piccadilly, and not commiserate the architect who found himself obliged to stack a garret upon an attic, which gave him a conclusion on which he would so willingly have paused once for all. There seems no more helpful solution for the difficulty than to summon heart of grace, and resolve to treat the topmost story handsomely; to smooth the transition from the story below it by not admitting too great a difference between them, and so attain to that compromise so dear to diplomacy,—a practicable *modus vivendi*. This will certainly be in favour of a certain humaneness of style; expense may be increased, but we are only dealing now with cases in which it will be compensation for some extra expense that a treatment is avoided which shall suggest that as the work came to an end, resolution which had so far sustained expenditure lost heart, and hurried to conclusion as best it might, even though bad might be the best. Architectural style merits most cordial approbation when it succeeds in a combination like that which the Roman critic held to be characteristic of the happiest literary style:—

> "The happy point by him was hit,
> Who mix'd utility with wit."

But too true it is that internal convenience and external grace are seen all around us scowling at each other as natural enemies, and we have to stand by, distressed friends of both parties, as they fight the quarrel out; in many of such streets as we have alluded to, gracefulness seems fairly beaten out of the field; at most it makes some show of asserting itself about the doorway as if to leave a protest behind while effecting escape after endurance of disrespect no longer tolerable. Elsewhere with somewhat of the overbearing violence natural after such provocation, it shows itself as inconsiderate of the claims of a competitor who should be its sympathetic ally. In the symmetrically designed ranges of houses in the Regent's Park rejoicing in all the freshness of triennial paint, ornamental architecture has its own way without restriction, and arches and arcades, porticos, pilasters, and cornices make the most of their opportunity, let those who seek comfort and convenience behind them murmur as they may. Again, the chief suffering falls to the lot of the unfortunate upper stories. The order attached to the façade finds it necessary to its dignity to push up its cornice beyond the level of their floors, and up to the line of their window-sills,—a cornice with such a projection as to cut off all view of the Park from the windows, if, indeed, the windows also were not in many instances forced up to such a height from the floor that outlook in any case would be inconvenient. But it is in these and the like cases that the conflict of the powers is, in fact, internecine,—is mutually destructive; for fatal to the true dignity of the exterior aspect is the betrayal by the only half-hidden deformities of windows peering over the edges of parapets or peeping between balustrades, of the tyrannous clumsiness by which the victory, such as it is, has been achieved.

If this objectionable result is recognised, but the contest is still to be sustained under the conditions of maintaining a certain theory of dignity at any cost, there remains an even more desperate expedient. This troublesome story, inevitably topmost in position, while in purpose and suggestive associations inferior and subordinate, has to be hustled out of sight. The wall of the front shall not be pierced to give it light by windows so small and of such depressed proportions as to be significant of meanness, or by any windows at all; but it shall be raised so as to mask, and, indeed, to imply disallowance of the existence of, any such story, which still can receive light behind it by unseen skylights. This is a stratagem which has found favour with the designers of some club-houses of very imposing character. The difficulty which it should then be incumbent upon a designer to surmount, but which it must be said he too often takes the liberty magnificently to ignore, is in what manner to suggest to the spectator any reasonable explanation of the excessive height of blind wall above the highest visible windows of what exhibits itself as the uppermost story. In stately Italian palaces it is consistent that the proportion of blank wall above a window should be large, and the top of the window proportionately nearer the floor; so is the requirement of welcome shade conciliated with sufficiency of light; but in our northern latitude that light is most valuable which enters near the level of the ceiling, and a blank space which inevitably is taken to imply a large interval from ceiling to window, carries the suggestion of the cavernous, of oppressive and uneasy gloom within. Little relief is given by an attempt to produce animating play and variety by a deep cornice with overcharged mouldings, or a frieze below it enriched with festoons and emblems. This is one of the cases in which cumbrousness of apology only attracts attention to the seriousness for the need of excuse.

The existence of the suppressed story is at last only imperfectly, indeed often only carelessly, masked, and one hint of dishonesty shakes faith more extensively. A suspicion will intrude that the magnificently-distributed façade is, in fact, but a jacket, so to speak, and an ill-fitting jacket. May we not be looking at what is, in fact, but an ornamental box, within which conveniences may be stowed away, ingeniously enough for economy of space and in positions where the owners by familiarity can lay their hands upon them, but positions scantily expressed by the external ornament, contents having as little organic connexion with their envelop as the anatomy of a hermit crab with the shell which it casually appropriates?

The battle of life, it is true, is not to be carried on and carried through without certain compromises, and the conflicts involved in the practice of architectural design are episodes in the general battle, and participate in its conditions. Mere blunt conscientious intentions will not be a sufficient guide in either case. Neither life nor architecture is so simple that we can find our way through their difficulties by only meaning well. The artistic sense, like the moral sense, has to be sharpened by reflection, and cultivated by exercise, and refined by observation of examples, by reverential attention to spontaneous promptings, that do not at once explain themselves. It is in such promptings that imagination often volunteers good aid to studious invention, and so is cleared many a problem quite as intricate as the detection in a complex of requirements for convenience, of a scheme which, while subordinating the lower, makes it conduce by harmonious contrast to the special dignity of the lofty, and achieves appropriate characteristic expression by the peculiar terms of their association.

THE ART OF THE CALIPHS.

IN what has come to be understood as the existing "art movement," not one of the least important factors may undoubtedly be said to have been the influence of the art of the East, as it has been revealed to us since the Great Exhibition of 1851; and not alone the art of Japan, of China, of Turkey, and of India, but the art of Persia, of Egypt, of Algiers, and Moorish Spain, has found its admirers among the most refined of our leaders in matters of taste. Japan, we may say, has already begun somewhat to pall upon the public, in spite of its wonderful and brilliant products; but the art of Persia, the art of the Moors,—in a word, the art of the Caliphs,—ever since the day that Algeria was conquered by the French half a century ago, and the contemporary romantic poets and painters sang and pictured the beauties of the Alhambra and the dreams of the land of the Arabian Nights, has had among the refined its passionate admirers in England and in France. Its delicate products, its choice and exquisite illuminated manuscripts; its filmy, fairy-like, and gorgeous fabrics and tissues; its embroideries and rugs, which the painters ever since the Renaissance have admired; its finely-tempered arms; its patiently-elaborated damascened caskets; its brilliant pottery, have peculiarly appealed at all times to the artistic temperament. Among the great periods of art, that of the Mussulman caliphs of the East and West now takes its place as not the least brilliant in artistic history; the art which the descendants of the simple shepherd Arabs who rallied round Mahomet developed from their contact with the peoples whom they conquered, and whom they found living amidst the relics of a brilliant past civilisation.

When Mahomet died, A.D. 622, the direction of his growing empire, left without a head, fell to the care of Abou-Beker, the father of the prophet's favourite wife Ayesha. On assuming the supreme authority Abou-Beker refused to take the title of king or prince, contenting himself with the modest title of caliph or "successor," a title borne to the present day by the Sultans of Turkey. As the Mussulman empire extended further and further before the conquering armies of the Moslems, the power was sub-divided into several caliphates, of which the three principal were those of the East, settled at Bagdad, to which it had been moved from Mecca; that of Spain, settled at Cordova; and that of Egypt, at Cairo. Under these rulers the Mussulman empire was in a short century extended from India to Spain. Contemporaneously with their power was developed an art with the beauties of which all persons of refinement are familiar, but of the elements, the details, the variations and successive creations of which we are still but imperfectly informed. The most brilliant productions of this art of the caliphs we have been taught to seek in Spain, where Cordova will always remain, with its picturesque Moorish battlements, "the city of the Caliphs," and where the Alhambra will for many a generation to come fulfil the traveller's utmost dream of all that he may have read and pictured of Oriental splendour.

But if we turn to the Arab art to be found in countries like Syria and Egypt, where the influences brought to bear on its development varied so completely from those of Spain, a great difference will be seen existing between the art of the Arabs proper and the Moors of the West,—between the art of the caliphs of the East and that of the caliphs of the West.

With the Moorish architecture and art generally the artistic world has long since been made familiar, and though it may be said that there it was that the art of the caliphs flourished in its greatest brilliancy, yet it must be remembered that in Egypt and Syria also the caliphs exercised their power. Damascus, Aleppo, Bagdad, and Cairo were cities in which the artistic tastes of the caliphs of the great days of Moslem power were exercised, and which, to this day, bear the evidence of their magnificence. For us, however, at the present moment, the Caliphate of Egypt possesses the most interest; it is it with which we are now daily brought into contact, and the threatened fate of the brilliant capital, Cairo, the second city in importance in the Mussulman empire, has not unjustly roused the warmest fears of the artistic world.

We possess but few authorities respecting the subject of the art of the caliphs, the works in existence are chiefly of an illustrative character. In a previous paper on the art of the Arabs mention was made of M. Bourgoin's "Arts Arabes"; it consists, however, of but a few pages of text, the rest being composed of a valuable and elaborate series of drawings and studies of the geometric principles of Arabic art; the same may be said of M. Coste's work, previously referred to, and of Hay's "Views in Cairo." Girault de Prangey's works, published now hard on forty years since, still remain invaluable for purposes of study, the use of "the admirable instrument invented by M. Daguerre," to which the author makes reference, rendering the illustrations unimpeachable for their accuracy. But the letterpress is scanty; it is only on the Arab art of Spain that De Prangey is discursive. Information, in fact, is still sadly wanting on the subject, and a field lies open for much interesting and attractive study. As one of the results attendant on our present action in

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Egypt, we may not unreasonably look forward to fresh acquisitions made in our limited acquaintance with the art of the Egyptian caliphs.

With the brilliancy of its creations, travel and our museums have of late years rendered the inquiring public comparatively familiar; but we as yet form only a very scant idea of the splendour and refinement of the life of the caliphs who opposed our hardy Crusaders. It would, indeed, be difficult to imagine a greater contrast than that offered by the existence led by the Orientals and that of the sturdy English, French, and German warriors who, in the deepest twilight of the Dark Ages, sallied forth from their gloomy fortress homes and rough castle life to break in upon the no less brave and warlike but refined Infidels. In the history of Western art and civilisation, the influence exercised by the Crusaders is well known, the result of the contact of our boisterous warriors with the cultivated and artistic Easterns.

The refinement in which they lived was indeed ideal, and the art of the caliphs all that the "Arabian Nights" have ever pictured to the mind of the most romantic. When we see the grandiose mosques which still stand in all their ruined beauty, to attest the magnificence of their builders, we can understand that there is no exaggeration in the stories of the historians of the artistic splendour of the caliphs who opposed our steel-clad "Red Cross Knight." Accustomed as we have become to the luxuries of our modern civilisation, our eyes feasted in museum after museum, in exhibition after exhibition, with the creations of the art of every land from the most ancient times, we can still scarcely picture to ourselves such rareties of decorative splendour as those which filled the palace of the caliph of Cairo, Mostanser, the father of Mostaali, from whom, never let it be forgotten, Jerusalem was taken by Godefroy de Bouillon in the last year of the stirring eleventh century. We have, in the pages of the Arab historian, Makrisi, the very curious and detailed relation of the pillage by his discontented Turkish officers of the caliph's palace at Cairo. The account, perhaps for the first time brought before English readers, gives us some idea of the art of the caliphs of this brilliant period of Arab history.*

Never, it would seem, was life more tormented than that of the Egyptian caliph Mostanser. Attacked in his palace by his own guards, like Job, he found himself reduced to the extremest misery. The priceless treasures of the palace, collected year by year for generations previously, he saw scattered among his mutinous officers and servants. The jewellers called in to value the contents of the treasury could only assure the pillagers that such objects as they were called upon to appraise were beyond all monetary value. We are told of bushels of pearls, 1,200 rings of gold and silver, ornamented with precious stones of every species and colour, all heirlooms; caskets of gems which, the jewellers assured the officers, it was impossible to value, they were such as could alone be owned by princes. One casket Makrisi mentions as full of vases of the purest rock crystal, and other caskets filled with vases of precious metals. Numerous other choice objects of crystal are cited by the historian, who refers to a large number of enamelled plates of gold; 9,000 caskets of different forms, lined with silk and enriched with gold, each the case of crystal and other goblets; more than 100 cups of bezoar, on which were engraved the name of the Caliph Haroun al Raschid,—this shows their age, the caliph being the contemporary of Charlemagne, ninth century; coffers filled with poignards of gold and silver gilt, with handles of precious stones; innumerable inkstands, round, square, large, and small, of gold and silver, sandal and aloe wood, of ebony and ivory, enriched with precious stones, and remarkable for their perfection and elegance; coffers filled with cups of gold and silver, of every size and of the most perfect work; a multitude of porcelain jars of every colour, full of camphor; cups made of amber from Schahar; bladders of musk from Thibet, and aloe-wood closets full of furniture; huge basins for washing purposes, each supported by feet representing animals, and all of immense value; a multitude of cages filled with porcelain; a golden mat on which had been married the caliph Mamoun; twenty-eight plates of enamel enriched with gold, a present from the Greek emperor. An immense number of coffers filled with mirrors of steel, porcelain, and glass, all enriched with filigree of gold and silver, and bordered with precious stones, the handles of cornelian and other gems, and contained in cases of velvet and silk of gorgeous patterns, all fitted with locks of gold and silver; a large number of parasols, the canes of which were of gold and silver; nearly a thousand utensils of silver enriched with gold, to which the fineness of the work and beauty of the chasing gave an additional value. Numbers of chess-boards of silk, embroidered in gold; the "pieces" of ebony, gold, silver, and precious stones; 400 large cages of gold filled with jewels of every sort. Furniture of silver of great weight; 4,000 golden vessels for narcissus flowers to be placed in, and 2,000 others for violets; 36,000 pieces of crystal; 22,000 figures of amber of great weight, innumerable figures of camphor; 800 pieces representing melons; a turban enriched with stones,—one of the most curious and precious objects in the palace. From the perfume store was taken a quantity of Indian aloe-wood, pieces of camphor and amber of great weight; a buffet, of porcelain, of immense size; a rare crystal box; a golden peacock enriched with the most precious stones, its eyes of rubies, its feathers of gold enamelled with all the colours of the original; a cock of the same metal, with a crest of rubies of great size; a gazelle, the body covered with precious stones, its belly white, a tissue of pearls of great value; a piece of amber in the shape of a lamb; a melon of camphor of immense weight contained in a golden net enriched with stones; another, in a golden box of immense weight; an egg of rubies of immense weight; a crystal basin; a table of sardonyx, large enough for several people to sit at; a golden date-palm tree of inestimable value, in a golden case, the fruit of precious stones representing the date in all the degrees of its maturity; a gondola, with its flags and carpets complete, made for the Vizier Ahmed, and for which an immense sum had been paid for work alone, apart from the material; thirty-six other gondolas are mentioned, which served for the court, all richly carpeted; a garden, the soil of which was of chased silver gilt, the earth of amber, the trees of silver, the fruits of amber and other precious materials, the whole of immense weight. More than 50,000 pieces of Damask are spoken of, all enriched with gold; carpets, which had never been used, are mentioned as having been in thousands, some of red damask enriched with gold and of the most exquisite work, representing parks and elephants. From the wardrobes were dragged 3,000 pieces of red damask; a number of tents completely furnished with sofas, tiles, cushions, carpets, and curtains; tapestries of the greatest value; silk tissues; mats of gold and silver, adorned with elephants, birds, and other animals, some with portraits of former caliphs, one with a map of the empire, very old and of immense value; a tent of red satin woven with gold made for the caliph Montawakel. The palace of the caliph Mostanser contained, in addition, a prodigious number of arms, swords, lances, and cuirasses of every kind, many of them historical weapons; harness enriched with gold and silver and stones; bundles of pikes, 200,000 pieces of armour, all of the richest kind; hundreds of bucklers and standards of gold and silver, and trappings of incredible value gathered together since the foundation of the palace in the previous century. The whole of the armoury was, it would appear, reduced to ashes through the carelessness of a servant. Among the treasures lost were a number of tents of immense value, some described minutely as gorgeously decorated with woven and embroidered animals, peacocks, &c., in China silk of every colour, and all accompanied with their fittings. Some of these tents were so vast as to require twenty camels to transport them from place to place. The pole of one tent, "the great rotunda," was of silver and gold, and was no less than 65 cubits in height; the tent, 6 cubits in diameter, and 20 cubits round. It was formed of sixty-four pieces of stuff; 100 camels were required to move it. All the interior was adorned with embroidered figures of great beauty. It is worthy of remark that the tent was fitted with a very large ventilator. In the making of the tent no less than 150 workmen had been employed during nine consecutive years. Many other tents are mentioned, one as requiring 200 men to set up. We must postpone, however, what we have to say further.

* We owe this information to research in a somewhat out-of-the-way source, the "Mémoires sur l'Egypte," by M. Etienne Quatremère, Paris, 1811.

COLCHESTER CASTLE.*

CONSIDERING that a century and a half has passed by since Morant wrote his "History of Essex," and of Colchester Castle, and that no more modern historian duly qualified for the task, if we except Mr. Buckler, has entered the field since his day, it is certainly time that publicity should be given to the results of the long and frequent scrutiny to which archæologists and antiquaries of late have subjected that most interesting fabric. It is not too much to say that, thanks to the summer congresses of our chief archæological societies, and to the interest in such studies which has been fostered by local associations during the last thirty or forty years, new light has been thrown upon many such relics of antiquity, and a new life has been in many cases given to their existence.

This is especially true of Colchester Castle, which, though long since deprived of its upper story, and called even by Camden in his day a "ruin," still frowns over the north-eastern portion of that town, which once was a rival to London, and the capital of a kingdom, or, at all events, of a province, and sixteen or seventeen centuries ago the head-quarters of the Roman eagles in Britain.

The writer of the work before us, who, unfortunately, is anonymous, has spared no pains to get at the bottom of the real history both of Colchester and of its castle; and in so doing he has been allowed by Mr. Jas. Round, the owner of the castle and its demesnes, to examine all such documents as contain authentic information about its early history. Some of these were unknown to Morant; and on others much additional light has been thrown by the deeper study of the early history of this country, which has marked the second half of the nineteenth century.

There can be now no doubt, since Roman coins and sculpture have been found *in loco* in sufficient quantities to prove it, that the whole of the plateau occupied by Colchester and its western suburb of Lexden formed the site of the Camoludunum of Imperial Rome. On the north and east this site was strengthened by the Colne, then probably a larger river than now; whilst on the south ran a smaller stream,—still called the Roman river,—which was fringed on the other side by a forest. These streams formed the peninsula on which Camoludunum stood; and it is possible, as hinted by our author, that Lexden was the actual residence of Cunobelin.

That such a position should have been chosen as the station of several Roman cohorts, and the residence of their commander, was almost a necessity where the choice was so limited; and accordingly we find that Claudius, when he entered Britain in triumph, founded here that huge encampment, the outlines of which are probably still roughly preserved in the plan of the existing streets of Colchester. From and after the date of this invasion, the Roman Colonia, named Camoludunum, sprang into being among the conquered Trinobantes. There afterwards rose a heathen temple in honour of the deified Claudius; and here, after the temporary outburst of British spirit in the person of Boadicea, the city was refounded, and its walls were built more strongly than before, in such a way as to have lasted down to the present day. In fact, it is doubtful whether, except at Lincoln and at Chester, more perfect specimens of Roman buildings remain than the present walls of Colchester.

But what about the castle itself? There have not been wanting those who have rashly concluded that it is also a Roman structure, and that in looking on its walls, as they now stand, they are looking on an edifice which was reared in the days of Imperial Rome. The writer of the work before us has brought forward only to demolish the theory of the late Rev. Henry Jenkins, who thought that the castle is a temple erected in the earliest ages of history to the memory, or in honour, of the Emperor Claudius; and there are others who have fallen in with the view. All this, and much more of the same kind of theories, might very easily have been broached and have found supporters in the days when every round arch which the Normans built in England passed for "Saxon," and when the first principles of architecture, whether ecclesiastical or secular, had to be worked out anew, as the Anglo-Saxon grammar has been worked out during the last quarter of a century.

* "The History and Antiquities of Colchester Castle." Colchester: Benham & Co. 1882.

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The writer sees little or no reason for believing the legend which identifies Colchester with the birthplace of Constantine the Great; but he seems more disposed to accept the tradition that the Arthur of Camelot may have had more to do with Camoludunum than is generally supposed. If so, the prosaic Essex must put in a rival claim to the poetic region of Cornwall. "Does not Arthur himself tell us, with characteristic contempt for history," our author asks, "I have understood that *Belinus* and Brennius, knights of Britain, held the Roman Empire in their hands for many days, and also *Constantine*, the *son of Helen*, which is open evidence, not only that we owe Rome no tribute, but that I, *being descended from them*, may, of right, myself claim the Empire?' Is it, then," he continues, "too much to ask, that when, in the Laureate's Vision, we see

'The river, winding clearly,
Down to tower'd Camelot,'

we may be suffered to roam in fancy to the mystical birthplace of Constantine, to that 'Royal seat' of the great Cunobelin, which arose by the waters of the Colne?"

Those, however, who have seen, and have carefully examined the castle of Colchester, with every wish to accept the legendary story, can find nothing in the fabric to justify a supposition that in its present shape it had any existence before the Norman Conquest. Camden, writing in the reign of Elizabeth, observes that "historians report it to have been built by Edward, son to Alfred, when he repaired Colchester." Norden, the Essex topographer, writes, about the same time, as follows:—"Colchester, in the times of Saxons, was much battered and ruined by the wars of the Danes. Edward the Elder repaired it, and built a strong castle in it, of which there are still some remains, but ruined almost with age." Speed also attributes it to Edward. Later historians, however, such as Dugdale and Morant,—the latter basing his authority mainly on documentary evidence,—assert that the castle is of Norman origin, and that it was "built by Eudo Dapifer, upon the remains of King Coel's Palace."

The more that we examine in detail the configuration of Colchester Castle, the more closely shall we see it to resemble that of the keep, or White Tower, of the Tower of London, with this exception, that in its area it is nearly double the size of the latter. The keep of Colchester Castle,—for this is in reality all that is now visible above ground,—is a huge, oblong structure, about 152 ft. by 111 ft. square, whereas that of the Tower of London is only 116 ft. by 96 ft. The general arrangement was similar in both, namely, a basement, which was used for cellarage or storage; a first floor, which served as quarters for the garrison; a second floor, which was the principal one, for the state apartments; and a fourth, or attic story, which was used as a kind of fighting deck. This arrangement remains perfect in the Tower of London, but at Colchester, the two topmost floors have all but disappeared. Both buildings are similar with regard to the arching of the loops, their tortuous and intricate communications, and in the absence of fore-buildings. Each is entered in precisely the same peculiar manner; in each there is one, and only one, large newel staircase, leading from the floor to the summit, and in each there are similar large apartments; the windows, formed in the same manner, are similarly situated, and each possesses a general similarity of plan. "In short," as our author remarks, "to recur to Dr. Stukeley's opinion, 'they are works of the same time and manner, and probably of the same hand.'"

It may be said, however, that all along the best antiquaries, Morant included, have looked upon Colchester Castle as a Norman structure. But these persons have too readily taken upon trust the statement that its erection was the work of Eudo Dapifer, under William Rufus. Mr. Freeman, in a later edition of his "Norman Conquest" (1877), has gone so far as to accept the above statement, for, side by side with Eudo's authentic foundation, the tradition of his building the castle has been allowed to creep in. He writes: "The house of Rye rose high in William's favour. One son, Robert, became Bishop of Leez, and another, Eudo, the king's *dapifer* and Sheriff of Essex, founder of the house of St. John, at Colchester, *and, in all likelihood, builder of the neighbouring castle, vastest of Norman donjons.*" The writer of the present work, however, shows good reasons for holding, in spite of such tradition, that the Castle of Colchester was the work, not of a subject, but of a king, and that the king who erected it was the Conqueror himself. "Not only does the architecture, when rightly understood," he writes, "itself bear witness in our favour; not only have we definite proof that in 1091, at any rate, the castle was already standing, but we should also infer the fact from the very history of William's reign. 'Most of the castles whose foundation is distinctly recorded, naturally belong to places which came into William's hands in the course of later warfare. But there were castles in southern and eastern England also; and it is most likely that their foundation at least, if not their completion, was among the very first works of William's reign. In one case, indeed, we have distinct evidence of the fact. The borough of Norwich . . . . stood at no great distance from the sea which separated, or rather united, England and Denmark . . . . Norwich was, therefore, a point which called for special attention . . . . A fortress was therefore built within the walls of the city.' (Freeman's "Norman Conquest.") Now it is obvious that this argument would apply with even greater force to Colchester. A town of importance, both from its size and its fortified position, it stood at the head of a great estuary, and was thus peculiarly exposed to the danger of Scandinavian invasion. Its capture by the Danes would have been a serious blow to William, and it is absolutely certain that he must have hastened to strengthen it with a fortress. If a warning was needed to convince him of the danger, it was afforded in 1069 by the Danish raid up the valley of the Stour. But though a temporary building must have been thus early erected, the existing fortress was a work of his later years. I venture to think that we may safely assign its erection to the period between the accession and the invasion of St. Cnut, that is, between the years 1080 and 1085. At no time during the reigns of the Conqueror and his sons was the danger so great to the east coast, and the need of its defence so urgent."

The history of the castle from and after the days of our Norman sovereigns may be very briefly stated. During the revolt of the barons against King John it was alternately in the hands of the rival armies. It was captured by Prince Louis, the Dauphin of France, in 1217, but was retaken in the following year. In the reigns of Mary and Elizabeth alike its gloomy chambers and dungeons had to serve as a prison for many who were condemned to suffer for "conscience sake," both Protestants and Catholics.

Under the brief rule of Cromwell the fair town of Colchester, with its large intermixture of foreign Protestant settlers and its traditional hatred of ecclesiastical persecution, formed one of the strongholds of the Parliamentarian party. Its castle, however, from its situation and its ruinous condition alike was rendered of no account in the military history of the siege. History tells us how the gallant and loyal officers, Sir Charles Lucas and Sir George Lisle, were shot by Fairfax, under orders of a council of war, beneath the walls of the castle. For a century and a half, at least, after that date Colchester Castle seems to have done duty chiefly as a prison, and to have accommodated within its gloomy walls almost as many quakers as Wisbech Castle received of Roman Catholic priests.

In the last century a large part of the northern wall was demolished by a Mr. Wheely, who also destroyed the well and caused much other havoc, which, had it proceeded, might have left but little of the building standing; but, happily, about the middle of the last century, the fabric and the adjoining lands were purchased by an enthusiastic antiquary, Mr. Charles Gray, M.P., who, in his turn, bequeathed them to the Rounds, a family in whom taste and reverence would seem to be hereditary, and who have taken good care that, so far as it is in the power of man to do so, the progress of decay shall be arrested.

Westerdale, Yorkshire.—On Sunday last an oak reredos, erected in the parish church of Westerdale to the memory of the late Hon. Col. O. Duncombe (the gift of the family), was unveiled in the presence of a large congregation. The work was executed from the design of Messrs. Perkin & Bulmer, architects, of Leeds, by Mr. J. W. Appleyard, also of Leeds.

THE ARCHITECTURAL ASSOCIATION EXCURSION.

THE thirteenth annual excursion did not carry the members far from London,—Kettering being the head-quarters, and Oakham, which was reached thence by railway, being the furthest point. The London members of the Association are apt to look upon London as the point to measure from,—but do not quite take in the situation when they do so,—for an excursion, just at home like this last, made some of the excursionists travel about 600 miles, in straight travelling, out and home again. More than half of those taking part this year came from country towns and from Ireland. Mr. E. G. Hayes, the president of the Association, took the chair at all meetings, generally guided the party, and represented the Association officially. When the time came for thanking the officers, Mr. C. R. Pink, who has been the active excursion secretary so many years, received due honour; as also Mr. J. A. Gotch, of Kettering and London, who had furnished local knowledge and taken a good deal of pains. Some of the buildings were described by Mr. James Fowler, of Louth. We subjoin some notes partly taken from an intelligent account of the excursion written by one of the party, and printed in the *Northampton Herald*. This will give our readers a general idea of the district and the visits. Some notes on a few of the more interesting topics will appear in a future number of the *Builder*.

The objects of the excursion being more architectural than archæological, and the search being rather for beauty than mere antiquity, the most ancient remains in the county were passed over in favour of work of the Middle Ages and the Renaissance. On the first day the excursion started for Oakham. Here the fine church was visited, very thoroughly restored by Sir G. G. Scott; and thereafter the Castle Hall,—the most perfect Norman banqueting-hall existing. The building consists of what may be termed a nave and two aisles, and the uninitiated might well be forgiven if they thought themselves inside an ancient church. But it never was a church. In those days there was no sharply-defined style applied exclusively to churches, while a totally different one was employed for houses. All were built with similar details, varying according to the use to which they were put. The principal reason why we are accustomed to regard Gothic architecture as essentially ecclesiastical is that most of the houses in which it was employed have perished, whereas the churches have escaped. The carving here is especially fine, and includes what is said to be a portrait of Henry II., in whose reign the hall was built; but as another contemporary carving is said to be James I., these assertions must be taken for what they are worth. At Burley-on-the-Hill a short stay was made to enjoy the magnificent prospect, and take notice of the plan of the house and its colonnades. Exton Hall, the seat of Lord Gainsborough, was next on the programme, and the picturesque ruin of what was once a very fine Elizabethan hall received the attention it deserved, as well as the finely-treated tower of the church, with its characteristic spire-capped lantern. The church was restored by Mr. Pearson some thirty years since. A long drive over the Rutland hills brought the party to Lyddington, where a mad onslaught was made (metaphorically speaking) on the Bede House. This is one of the most interesting buildings in the neighbourhood, abounds in picturesque groupings, and has carved cornices, some very fine stained glass, and other magnificence. It must not be supposed that all these glories were originally lavished on the poor. The place was once a bishop's palace, but becoming the property of a private individual in the sixteenth or early seventeenth century, it was converted into a bede house; and very few bedesmen are so handsomely lodged as those at Lyddington.

The next day (Tuesday) saw the party off in carriages, starting from the Royal Hotel at Kettering, the very comfortable head-quarters of the excursion, to Loddington, where the church and the Manor House claimed attention. The church is a remarkably fine one for so small a village, and adds a very elegant example to the spires for which the county is famous. The hall is, however, even more interesting than the church, inasmuch as it has come down to us unmodernised in plan, and one can see at

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this day just the arrangements which satisfied a squire from the reign of Henry VII. to the middle of last century. The western wing is the earliest in date, and contains a fine open fireplace and cellars. The rest of the house dates from Elizabeth's reign, when nearly every house in the kingdom was improved, and many were newly built. The entrance-hall is surrounded with ancient panelling, where the difference between the way of working in Elizabeth's time and Charles II.'s may be seen at a glance. From Loddington the party went to Rothwell (called generally Rowell), where the rambling old church, which contains examples of work of almost all dates, and Tresham's delightful Market-house, occupied much attention. The church here is the largest in the neighbourhood, being as wide as Kettering Church, and considerably longer. The Market-house is a silent witness to the misfortunes of its author, the most ingenious man the county has produced. The Manor-house was admired for its door and staircase, but at the date when this house was built architecture had already commenced the rapid decline which brought it to the bottomless pit of early nineteenth-century work. Of its style, however, the doorway at the Manor-house is a very good specimen, and does considerable credit to its builder, the celebrated Serjeant Hill. From Rothwell a drive by Stoke Albany, where the remains of the Manor-house were inspected, and the very perfect details carefully sketched and measured, and by Wilbarston, whose dilapidated church struck melancholy into the hearts of the visitors, brought the party back to Kettering.

On Wednesday Warkton Church and the remarkable monuments of the Montagues by Roubiliac (about 1750) and Peter Matthias Vangelder (1781) were visited, and then Weekley, with its charming village-green lying between the hospital, the church, and the great trees of Boughton Park. No village can vie with Weekley in the delightful calm of its green, where the ancient bedesmen "grow old with the silent years," as the motto over their door has it, and endeavour, as far as changed circumstances will permit, to follow out the quaint rules laid down for their guidance by the Sir Edward Montague who founded their house 270 years ago. From Weekley, a walk through the park and past Boughton House led to Geddington, where the church, the cross, and the ancient bridge justified well a stay of some two hours. After Newton, with its pretty little church, and the Dove-house,—the only relic of the once extensive mansion of the younger branch of the Treshams,—came the great visit of the day,—to Rushton Hall. It would occupy columns to describe the Hall, which is one of the most impressive pieces of Elizabethan architecture in the country. It has not the picturesque variety of Drayton and Rockingham, nor the elaborate detail of Kirby; its attraction consists in its simplicity and quiet dignity, chiefly arising from the fact that the original design was adhered to by the successive builders. The main bulk of the mansion would seem to have been begun by the grandfather or great-grandfather of that Sir Thomas Tresham who will always occupy a prominent place in the memory, if only for his taste for quaint and symbolical building. The author of the Triangular Lodge and Rothwell Market-house left his mark on his ancestral home as well, and when he died, and the estate passed from his son, in consequence of his complicity in the Gunpowder Plot, the Cokaynes, who purchased Rushton, completed what the Treshams left unfinished. Scarcely less interesting than the house are the beautiful grounds, in whose alleys Dryden walked and wrote "The Hind and the Panther." In a distant corner of the grounds stands the Triangular Lodge, the only building of Sir Thomas Tresham's which is known to have been completed, and which, thanks to the care of its owner, Mr. Clark Thornhill, is in admirable condition. The Lodge is a mass of symbolism, apparently preaching in stone the mystic doctrine of the Trinity. Some of the numbers still defy all attempts at elucidation. It is illustrated pretty fully in a very early volume of the *Builder*.

The next day Drayton was the first place visited. In associations Drayton is in no way inferior to Rushton and its gardens, with their green lawns, clipped yew-walks, "berceaux and cabinets de verdure," and bright parterres, are alone worth a long journey to see. The house itself dates from the times when an Englishman's house was in very truth his castle, and from that time to this its checkered history is told by the jumble of styles in which the work is executed. Drayton has never been sold nor alienated, but by marriage it has passed through many hands, and every hand has left its mark. The mass of the walls is probably of the time of the Edwards; the windows, doors, chimney-pieces, and other features by which the date of a structure is most easily determined, are nearly all due to extensive alterations during the reign of William III. One wing is entirely Elizabethan, from its splendid vaulted cellars, where mighty barrels of beer stand in cobwebs and fungus, up to the chimneys, which recall Kirby. But here, too, alterations have been made, and the long gallery at top with one side furnished with ancient volumes, looks as if Lady Betty Germaine might have left it only a few months instead of a century. Lady Betty was Horace Walpole's friend, and she received Drayton from her husband, who in his turn had received it from his first wife, the last of the Mordaunts, who were descended lineally from the original owners. Walpole's famous letter anent Drayton was written July 23, 1763. Lady Betty left the estate to Lord George Sackville, from whom the present owner is descended. Her graceful reception and agreeable hospitality were in harmony with the traditions of Drayton. Lowick Church was next visited, notable externally for its bold tower, octagonal lantern, and flying buttresses; and notable internally for its fine brass of Sir Henry Greene (died 1467), and its alabaster tombs of Ralph Greene (1420) and Edward Stafford, Earl of Wiltshire (died 1499),—both exquisite works,—unique in parts. The "old oak" at Lowick, over ninety yards round the ends of the branches, will, it is feared, go quickly to its end. Last year the inside of the tree was burnt out. The fire was got under without the aid of the fire-engines, but the noble relic of the great forest was fearfully injured. At Lyveden stands another of Sir Thomas Tresham's buildings, quite as ingenious, and very much less *bizarre* than the Triangular Lodge. Lyveden New Building is not only remarkable for its quaint symbolism (the Passion being here commemorated), but for the purity of much of its architectural detail, very unusual for the time in which it was built. The Old Building is, in fact, rather younger than the New Building, but stands on the site of one of the ancient family seats of the Treshams, and between the two buildings are remains of fish-ponds and terraces, which bear witness to the lordly scale of the gardening of Elizabeth's time. Brigstock was the last halting-place. Here the remains of a considerable Saxon church, incorporated with the Mediæval building, indicate the existence of an early civilisation in that part of the county, a fact further confirmed by the records of Rockingham. The Manor-house is largely of a date previous to Elizabeth's time,—the great era of house-building,—and is supposed to have been the birthplace of that Sir Edward Montague, the Lord Chief Justice, who founded Boughton and the family of Montague of Boughton, and now lies buried in Weekley Church. In this house is an ancient wardrobe, which "goes with the house," because too large to be taken away; also a sixteenth-century bedstead, in which King John, of evil memory, "slept the night before he crossed the water." (!)

On the last day, Friday, the Association first drove to Rockingham, and thence by Gretton to Kirby. Rockingham has had, perhaps, a more eventful history than any house in Northamptonshire. From the earliest times it seems to have been a stronghold. William the Conqueror found it fortified, and left it more so. All the early kings, especially John, used to hunt here, and much of the place, as built by them and their successors, remains to this day, surrounded by later additions. The family of the present owner, Mr. Watson, obtained possession of the place in Henry VIII.'s reign, and the larger part of the existing buildings were built by them at various times, chiefly during the seventeenth century. The effect of the mixture of styles, and the commanding position of the place, give it a charm of its own. Nothing more interesting, each in its own way, could be found in any part of England than Rushton, Drayton, Rockingham, and Kirby. Kirby was the last important place visited, and it is the richest in detail. Here may be seen, side by side, the work of two of England's greatest architects, John Thorpe and Inigo Jones. Thorpe seems to have designed a considerable amount of work, completing a house carried well forward previously by "Humfre Stafard,"—as he called himself on the parapet outside the great hall; while at a later date (1638, &c.) Inigo Jones was employed to remodel some of the façades. Kirby is, indeed, a melancholy place. Ruin works swiftly and silently before our very eyes. Every visit reveals some fresh disaster. Even now the south-eastern staircase, with its elaborate ceiling, trembles to its fall, and it is only held in place by pieces of the wooden wall-linings. The roof of the great hall has leaked till the wall is green and crumbling, and very soon this magnificent apartment will be open to the sky. Trees are growing on the walls and rending them to pieces, and if the cruel neglect is continued, a few years will see the last stones hurled to the ground to be broken up, as stones are at the present moment being broken up, to mend roads. Stanion Church, which has a good Perpendicular arcade and an elegant tower and spire, was seen and sketched on the way to Kettering. The proceedings thereafter were the final dinner, a little speech-making, and a due remembrance of "Auld lang syne." Saturday morning was spent at Kettering Church. Its tower and spire of the same class as Oakham and All Saints, Stamford, but with many points of difference in general arrangement and in detail, had been well in view all the week,—from near and far as the party left and came back towards their headquarters; and its pleasing outline in the centre of many a picture will dwell in memories which will recall with pleasure many other good points seen and noted in the interesting district.

THE APPROPRIATION OF WAGES AND INCOME.

IN the Economic Science and Statistics Section of the British Association meeting at Southampton, Professor Leone Levi read the report of a committee appointed for the purpose of continuing the inquiries into the appropriation of wages and other sources of income, and considering how far it was consonant with the economic progress of the United Kingdom. The report set forth that out of a gross personal expenditure amounting to about 878,000,000*l*., some 728,000,000*l*., or about 83 per cent. was probably spent on necessaries, and 150,000,000*l*., or 17 per cent. on luxuries and waste. Out of a net or national expenditure of about 684,700,000*l*., about 614,000,000*l*. was probably spent on necessaries, and about 70,000,000*l*. on luxuries, the percentage being respectively 89 and 11. The nation in reality spent only the half of what the individuals spent on luxuries, because large portions of these consisted of taxes and profits of distribution which remained in the country. Of late years the expenditure on the necessaries of life had greatly increased, and a comparison of the quantities per head consumed of the principal imported articles showed not only that people had much greater command over the articles of food than they previously enjoyed, but that their expenditure on these occasions had increased in a larger proportion than the expenditure on alcoholic drinks and other luxuries. Likewise the expenditure on house rent had largely increased, partly from the increased cost of houses, and partly from the greater capacity of the people to enjoy the comfort of a commodious home. Comparing 1881 with 1831, there was a large increase in the number of persons living in houses at high rents. Another evidence of the increasing prosperity of the country and of the productive manner in which the money was spent was that there was reason to believe that the labouring classes represented 70 per cent. of the population, and the middle and higher classes 30 per cent. In other words, 26 million persons might be taken to belong to the labouring classes, and 11 million persons to the middle and higher classes. The approximate division of expenditure between the classes was as follows:—Gross personal expenditure.—Working classes, 423,600,000*l*; middle and higher classes, 454,400,000*l*. Net or national expenditure.—Working classes, 333,300,000*l*.; middle and higher classes, 351,400,000*l*. With regard to the relative expenditure of the classes on necessaries and luxuries, the figures were as under:—Working classes.—Personal expenditure, 80 per cent. on necessaries and 20 per cent. on luxuries; national expenditure, 90 per cent. on necessaries, and 10 per cent. on luxuries. Middle and upper classes.—Personal expenditure, 86 per cent. on

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necessaries, and 14 per cent. on luxuries; national expenditure, 89 per cent. on necessaries and 11 per cent. on luxuries. The working classes appeared thus to devote a larger proportion of their incomes to luxuries than the middle and higher classes, a fact all the more to be regretted since they were thereby left with so much less available for necessaries. The total income of the people of the United Kingdom might be taken at about 1,000,000,000*l.* Estimating the total earnings of labouring classes at 436,000,000*l.*, and those of the middle and higher classes at 564,000,000*l.*, it would be seen that after expenditure there would be left to the working classes a surplus of 13,000,000*l.*; and to the middle and higher classes one of 110,000,000*l.* The general results of the inquiry were not discouraging. It was gratifying to know that the great bulk of the income of the people was productively expended, and that though much devoted to luxury, and a goodly portion was wasted, still a handsome annual surplus remained for reproduction, which went to swell the capital of the nation.

In the discussion which followed,

Professor H. S. Foxwell said that the whole report was based on a distinction between what was called necessary and luxurious expenditure. Such a distinction was quite one of gradation. It was impossible to draw an absolute line, and there would be very great dispute about the point at which the Professor drew it. For instance, the Professor excluded from the list of necessaries amusements and other things which many persons would include. The dullest and most intolerable form of life would be that in which people were only consuming and producing necessaries, a life which must cease for want of energy. He thought that consumption was considered somewhat too narrowly. He regarded it as an incentive to industry.

Mr. Hurst urged that it was by some people enjoying luxuries that numbers of other persons were enabled to get bare necessaries of life.

Mr. M'Knight referred to the culpable misspending of money involved in the giving of the dinners of large London companies, and pointed out that while the working classes spent 9,200,000*l.* on tobacco, they only expended some 1,100,000*l.* on education.

Mr. Stephen Bourne submitted that, taking them broadly, the conclusions of the report must be considered to be correct, and contended that all labour should be applied to that which was useful, though it might not all be reproductive.

Sir Rawson Rawson remarked that it appeared that the expenditure of the upper class family was only two and a half times that of a labouring class family. Another still more extraordinary fact was that the taxation paid by the working classes was 16s. 1d. per family, and for the middle and higher classes 16*l.* 6s. 10d. Again, the surplus after expenditure in the case of the working classes was 3 per cent. on the income, and in the case of the upper classes 20 per cent. It was also remarkable that the expenditure of the lower classes on beer and spirits was just double that of the upper classes, while, of course, on wines the excess was in the upper classes. He noticed that whereas the increase in the consumption of spirits, wine, and tobacco, between 1840 and 1880, was 75 per cent., the increase in regard to cocoa, raw sugar, and tea was 272 per cent.

After replying upon the discussion, Professor Levi referred to the fact that during the year two members of the committee, Professor Jevons and Sir Antonio Brady, had died, and moved a resolution, which was seconded by Sir Rawson Rawson, and carried, setting forth that the section deeply deplored the loss of the late Professor Jevons, a former president of the section and a member of several committees at different places.

HOUSES WITHOUT DAMP-PROOF COURSES.

AT a meeting of the directors of the Nineteenth Century Building Society on the 30th ult., at the offices, Adelaide-place, Mr. H. Waldemar Lawrence in the chair, the following resolution was passed, on the motion of Mr. Mark H. Judge:—

"That, as certain houses now being built in West Ham, and proposed to be purchased through the Nineteenth Century Building Society, have been found by the society's surveyors to have no damp-proof course, the directors refuse to advance any money on property so built, and hereby instruct the Secretary to ask the local authorities whether such houses are being built with their approval."

MODERN FACILITIES FOR LOCOMOTION AND TRANSPORT.

MR. JOHN FOWLER, C.E., as president of the Mechanical Science Section of the Southampton meeting of the British Association, in his inaugural address, said:—

Of all the important sections of the British Association, the one over which I have now the honour of presiding is, you will all, I think, admit, at once the most practical and the most characteristic of the age. In future times the present age will be remembered chiefly for the vast strides which have been made in the advancement of mechanical science. Other days have produced as great mathematicians, chemists, physicists, warriors, and poets, but no other age has made such demands upon the professors of mechanical science, or has given birth to so many men of eminence in that department of knowledge. Though a member of the profession myself, I may venture before my present audience to claim that the civil engineer is essentially a product and a type of the latest development of the present century. Telford has admirably defined the profession of a civil engineer as "being the art of directing the great sources of power in Nature for the use and convenience of man, as the means of production and of traffic in states both for external and internal trade, as applied in the construction of roads, bridges, aqueducts, canals, river navigation and docks, for internal intercourse and exchange, and in the construction of ports, harbours, moles, breakwaters, and lighthouses, and in the art of navigation by artificial power for the purposes of commerce and in the construction and adaptation of machinery, and in the drainage of cities and towns." This definition, written more than half a century ago, is wide enough to include all branches of engineering of the present day, although amongst those specifically mentioned the departments presided over by the railway engineer, the locomotive superintendent, and the electrician will be looked for in vain. As Telford was beyond all question the most widely experienced and far-seeing engineer of his time, this little omission well illustrates and justifies my statement that the typical civil engineer of the day is a late product of the present century; for even Telford never foresaw the vast changes which railways, steam, and electricity would evolve in the course of a few years.

There have undoubtedly been published during the last fifty years many works of mark and merit, but the work which above all others would, I think, have astonished and perplexed our ancestors, is the little one known to all the civilised world as "Bradshaw." This indispensable handbook of the nineteenth century testifies that the face of the country is dotted over literally with thousands of railway-stations; that between many of these stations trains run at two-minute intervals, whilst the distance between others is traversed at a mean speed of nearly sixty miles an hour. The public are often justly indignant at the want of punctuality on some railways, but they should blame the management and not the engineers, for the daily conduct of the heavy traffic between England and Scotland shows, that notwithstanding the constantly varying condition of wind and weather in this climate, a run of 400 miles can, on a properly laid out railway, and with suitably designed rolling-stock, be accomplished with certainty to the minute, if the management is not at fault. On the Great Northern Railway, for instance, of which I am consulting engineer, the 400 miles between London and Edinburgh is traversed in nine hours, or deducting the half-hour allowed at York for dining, at the mean rate of no less than forty-seven miles per hour including stoppages. A few months ago the Duke of Edinburgh was taken on the same line of railway from Leeds to London, a distance of 186¾ miles, in exactly three hours, or at a mean rate, including a stop at Grantham, of over sixty-two miles an hour. I know of no railway in the world where this performance has been eclipsed.

An essential condition of the attainment of high speed on the railway is that the stopping places be few and far between. The Great Northern express previously referred to makes its first halt at Grantham, a distance of 105 miles from London, and consequently but little power and time are lost in accelerating and retarding the speed of the train. In the instance of the Metropolitan Railway, on the other hand, the stations average but half a mile apart, and although the engines are as powerful as those on the Great Northern Railway, whilst the trains are far lighter, the average speed attainable is only some twelve miles an hour. No sooner has a train acquired a reasonable speed than the brakes have to be sharply applied to pull it up again. As a result of experiment and calculation, I have found that 60 per cent. of the whole power exerted by the engine is absorbed by the brakes. In other words, with a consumption of 30 lb. of coal per train mile, no less than 18 lb. are expended in grinding away the brake blocks, and only the remaining 12 lb. in doing the useful work of overcoming frictional and atmospheric resistance.

Nearly thirty years ago, when projecting the present system of underground railways in the metropolis, I foresaw the inconveniences which would necessarily result from the use of an ordinary locomotive, emitting gases in an imperfectly ventilated tunnel, and proposed to guard against them by using a special form of locomotive. When before the Parliamentary Committee in 1854, I stated that I should dispense with firing altogether, and obtain the supply of steam necessary for the performance of a single trip between Paddington and the City from a plain cylindrical egg-ended boiler, which was to be charged at each end of the line with water and steam at high-pressure. In an experimental boiler constructed for me, the loss of pressure from radiation proved to be only 30 lb. per square inch in five hours, so that practically all the power stored up would be available for useful work. I also found by experiment that an ordinary locomotive with the fire "dropped" would run the whole length of my railway with a train of the required weight. Owing to a variety of circumstances, however, this hot-water locomotive was not introduced on the Metropolitan Railway, though it has since been successfully used on tramways at New Orleans, Paris, and elsewhere.

A reference to the Underground Railway naturally suggests the wider question of tunnels in general. To foreign engineers belongs the honour of having boldly conceived and ably accomplished tunnel-works of a magnitude which would have appalled a canal engineer. I need only refer to the Mont Cenis Tunnel, over 7½ miles in length, commenced in 1857 and finished in 1870; the St. Gothard Tunnel, 9¼ miles in length, commenced in 1872 and finished in 1882; and the Hoosac Tunnel, 4¾ miles in length, commenced in 1854 and finished in 1875. In all cases rock of the hardest character had to be pierced, and it is needless to remark that without the aid of the machinist in devising and manufacturing compressed air machinery and rock-boring plant the railway engineer could not have accomplished the task. Tunnels under broad navigable rivers and estuaries have been a subject of discussion by engineers for at least a century, but the only one at present completed is the unfortunate and costly Thames Tunnel. Two important works of the class are, however, now well in hand, namely, the Severn Tunnel at Portskewet, and the Mersey Tunnel at Liverpool.

In many cases of tunnels under estuaries, special appliances could be used which would obviate all risk and make the successful completion of the work a mathematical certainty. A tunnel under the Humber, about a mile and half in length, projected by myself in 1873, the Bill for which was subsequently passed by the Commons and thrown out by the Lords, was a case in point. The bed of the Humber is of very fine silt, and I proposed to build the tunnel in lengths of 160 ft., under the protection of rectangular iron caissons, 160 ft. long by 42 ft. wide, sunk by the pneumatic process. As the pressure of air in the caissons would always be slightly in excess of that due to the head of water in the river, no interruption from influx of water could ever occur, and the operation of building the tunnel in lengths inside this huge diving-bell would be as certain and free from risk as the everyday work of sinking a bridge-pier by the pneumatic process.

At the beginning of the present century a committee was appointed to consider the "practicability of making a land communication by a tunnel under the river Forth, at or near Queensferry." In a report dated November 14, 1805, it was recommended that a double tunnel should be constructed, at an estimated cost of 164,000*l.*, or at the rate of 30*l.* per yard, exclusive of shafts and pumping. The surveyors reporting grounded their belief in its

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practicability upon the fact that at Borrowstowness coal workings had been carried under the same Firth for a mile, and that at Whitehaven coal was worked for the same distance under the Irish Sea, in both places less water being met with under the sea than under the land. The report concludes in the following words:—"That a more easy and uninterrupted communication betwixt every part of a country increases the intercourse of commerce, arts, and agriculture, all must know. Ferries are still and often a formidable bar in the road. Of these in this country, the one under review at Queensferry is, perhaps, the most conspicuous. It is, in fact, the connecting point betwixt the north and south of Scotland, and indeed of the realm, and in this point of view the improvement of it must be considered a national object." These words are as true and applicable to the case in 1882 as they were in 1805. A ferry still is the only means of communication across the Forth at Queensferry, though the traffic has increased a hundredfold. Parliament, by the passing of the Forth Bridge Act during the present session, has given a practical recognition of the truth of the statement in the above-quoted report, that the improvement of the Forth passage is a "national object."

MURAL DECORATION IN GERMANY.

THE political union of Germany has done much of late years to render men's minds capable of appreciating the work of such men as Janssen and others, who have, to a certain extent, founded a new school of German art. Though they no longer reside there, Düsseldorf claims the merit of having sent out these apostles of a new artistic creed, and as the *Kölnische Zeitung* lately remarked, Rhineland has every reason to be proud of this new school of monumental painting which has been so successfully inaugurated within the bounds of the province.

The principal work on which Herr Janssen has lately been engaged is the mural decoration of the Erfürt Town-hall. The sides of the staircase leading to the principal chamber will in a short time illustrate Thuringian legends and episodes from the life of Luther, in which the traditions of the old city afford the artist a great variety of subjects for treatment. The walls of the principal chamber have been covered with representations of local historical events. Three of the walls (each about 45 ft. in length) have been thus ornamented, the windows taking up the greater part of the fourth or western side. There are nine subjects treated, six of them being strictly historical, and three allegorical. The latter are above the entrance doors and are on a gold ground, which harmonises with their general character.

On the north side of the room the series of pictures commences with the introduction of Christianity in 719 by St. Boniface, who is represented in his monk's garb preaching to a crowd. The assembly includes many of the barbarian invaders who had settled in the district of Erfürt, whose gigantic stature and warlike mien contrast effectively with the figures of women and children which complete the *tableau*.

The diet held in St. Peter's Church, Erfürt, in 1181, by Frederick Barbarossa is strikingly represented. The principal circumstance delineated is the request for the emperor's pardon, which Henry the Lion made on that occasion, after his unsuccessful resistance during the previous year to the imperial authority.

The storming of the fortress of Ilmenau by the Erfürt ironworkers, and the attack on the town-hall in the year 1509, are delineated with much dramatic effect. The latter event is depicted at the moment when the populace has succeeded in breaking into the magistrates' chamber, and when its leaders are stating their demands.

The entry into the city of the Elector, John Philip, of Mayence, forms the subject of another of the pictures, and the richness of colouring which the costumes enable the artist to introduce with strict appropriateness adds much to its effect.

The last of the principal works represents the destruction of an obelisk made of wood and of canvas painted to represent marble. This monument had been erected by the French during their occupation of the city in the year 1810, and bore the inscription, "To Napoleon the Great." When the Prussians some time afterwards occupied Erfürt, the citizens destroyed this memorial of foreign invasion, and the moment selected for the vivid sketch of the event Herr Janssen has reproduced is that at which the destruction of the obelisk was taking place.

The allegorical paintings correspond in a general way with the historical works we have described, and serve to fill up many points of interest in the history of the old Thuringian city.

The town-hall at Hanover has also been treated in a more or less similar style by Herr Schafer, who has during the last five years been associated with the architect, Herr Hase, in the restoration of the building. The principal chamber is more than 70 ft. in length, and about 36 ft. wide. In the absence of such events in the local history as would admit of effective pictorial representation, the artist has produced on an extensive scale a series of allegorical pictures of the rivers of North Germany. Heraldic figures are also introduced in an appropriate manner, and various symbolical delineations complete the mural decoration of the chamber.

ENGLISH IRON IN GERMANY.

ACCORDING to a statement in the German press, on account of the low rates of freight from the United Kingdom to Hamburg by steamer, and the facility which the railways in Germany afford for the transport of imported iron, the Berlin purchasers for manufacturing purposes can get the English article at a price which competes successfully with the products of native industry. The first cost of iron at the works in Germany seems to be about 25 per cent. above the value of Scotch iron f. o. b. at Glasgow. The railway carriage to Berlin costs nearly as much as the freight, duty, and railway carriage on the imported article. Hence the supposed aduantages of the protective policy are lost. The matter is being brought before the Imperial Government of Germany with a view of obtaining such concessions in the railway rates of carriage of iron as would do something towards assisting the position of the German iron industry, and thus swelling the traffic receipts of the various lines interested.

As an instance of the extent to which our iron is used in Germany, it is stated that the lamp-posts in Berlin are made of English metal.

So much the better for the Berliners, looked at properly.

THE ENGLISH CHURCH AT PONTRESINA.

THE English church at Pontresina, in the Engadine, was opened on August 19, and consecrated by the Bishop of Bedford. A novel feature in the church is the substitution of wood for stone in the nave arches and clearstory. The plan is that of a parallelogram, 78 ft. by 56 ft. There is no external indication of the chancel, as the site was so limited in length that it was necessary to carry the aisles to the full extent of the ground in order to gain the required accommodation. A porch occupies the second bay on the south side. The side walls are 2 ft. 3 in. thick, of rubble with granite dressings; they vary in height as the ground falls rapidly from east to west, so much so, that there is a height of 20 ft. below the floor at the west end. This is utilised as a store-room, and could be adapted for warming apparatus. It has wide pointed arches towards the west, and at the sides. The style is Pointed, of the simplest character. The church is lighted by lofty triplets at the east and west, and by low coupled lancets at the end; the windows of the clearstory are trefoils pierced through the woodwork, those of the chancel bay are quatrefoils.

Internally there are five bays, formed by clustered wooden columns composed of four semicircular shafts with Early English capitals; from these spring smaller shafts supporting the principals of the nave, the wooden arcade, and the principals of the aisle roof. The spandrels are filled with plain boarding; those in the chancel are panelled; the arches are strengthened by struts, the intervening spaces being filled with open tracery. The easternmost bay forms a spacious chancel. A high screen divides the organ-chamber on the north side, and a similarly enclosed screen the vestry on the south side from the chancel. The altar, which is very massive, has six circular columns, with foliated capitals.

The plans were furnished by Mr. R. P. Pullan, who had designed a smaller church for the same site in 1874, and were excellently carried out by Mr. Ragatz, of Zurich. H.R.H. the Princess Christian, who has taken the greatest interest in the progress of the church, presented a handsome frontal, executed by the ladies of the South Kensington School of Needlework under Mr. Pullan's superintendence. The Princess also carried out the greater part of the floral decorations for the day's consecration. Mr. and Mrs. Bancroft were liberal contributors to the edifice,—they gave the central light of the eastern triplet, by Mayer, and also the bell. The Rev. J. W. Ayre, of St. Mark's, Grosvenor-square (the summer chaplain), who originated the present plan and collected the funds for its execution, presented the jewelled cross. The Rev. J. Nixon gave an ornamental fald-stool; and many of the visitors to the happy valley of Pontresina contributed largely to the funds.

The church seats 350 persons.

ROOD SCREEN AND IRMENSAÜLE, HILDESHEIM.

WE have previously given views and descriptions of the beautiful old Mediæval town of Hildesheim and its interesting cathedral, and it is now our intention to speak more in detail concerning the remarkable rood-screen and the very ancient and singular column called "Irmensaüle," which stands upon the flight of steps leading to the choir of the church.

The rood-screen in Hildesheim Cathedral is one of the most remarkable examples of the Early Renaissance to be found in Germany. It appears to have been erected about the year 1550, and its erection may be accounted for by the fact that in 1542 the cathedral was taken possession of by the Lutherans, who excluded the bishop and canons from the building, and subsequently closed it altogether. After the battle of Muhlberg, however, in which John Frederick, Elector of Saxony, was taken prisoner by Charles V., the church was given back to its original owners, and the bishop and canons were re-established, and this rood-screen is probably a portion of the restoration which the cathedral underwent at that time. This must not be confused with the entire restoration of the building after the thirty years' war, when the church was covered internally with plaster ornaments in the Rococo style. The names of the architect and sculptors employed upon the rood-screen at Hildesheim appear to have been lost, and it is rather strange that this beautiful and interesting work is unnoticed by those indefatigable antiquaries, Kugler and Rosengarten. All that appears to be known is that it was erected at the expense of a canon of the cathedral, named Freitag. It is constructed of a very fine sandstone, and (called in Germany "kreidesandstein") brought from the neighbourhood of Munster, in Westphalia. It is in a most remarkable state of preservation. The position of the pulpit in the centre of the screen is, as far as we know, unique. The desk for the Gospel consists of an eagle composed of brass, gilt. Whether there was originally an altar in front of this pulpit is doubtful, but the arrangement of the steps and platform would seem to suggest that one was intended, although the present altar is certainly modern.

The Irmensaüle which stands upon the steps in front of the screen is of very great antiquity, and was either an object of worship in Pagan times, or was used as a column supporting a statue of the god Armia. The metal-work bearing candles, which this column supports, dates from the twelfth century. The many other works of art contained in this cathedral have been previously described in this journal, and the great "coronæ," bronze font, and stalls have been illustrated.

WINDOW SCREEN FROM CAIRO.

THIS is one of several fine specimens of lattice woodwork now in the South Kensington Museum. The workmanship is somewhat rude, but admirably adapted to its purpose. In its original position, high up in some Eastern street, and with a beautiful play of light and shade upon it, the screen, no doubt, looked most picturesque. W. A.

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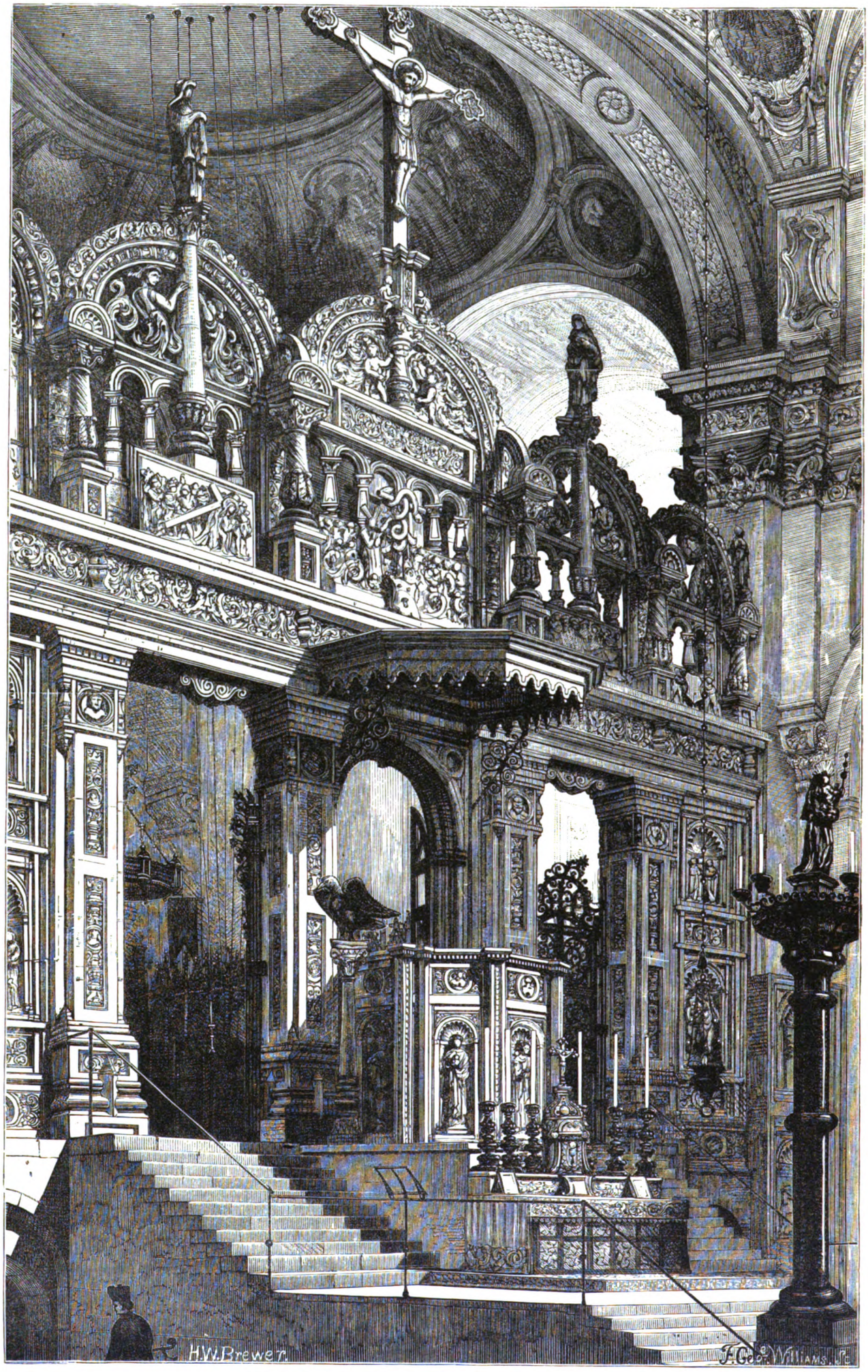

THE ROOD-SCREEN IN HILDESHEIM CATHEDRAL.

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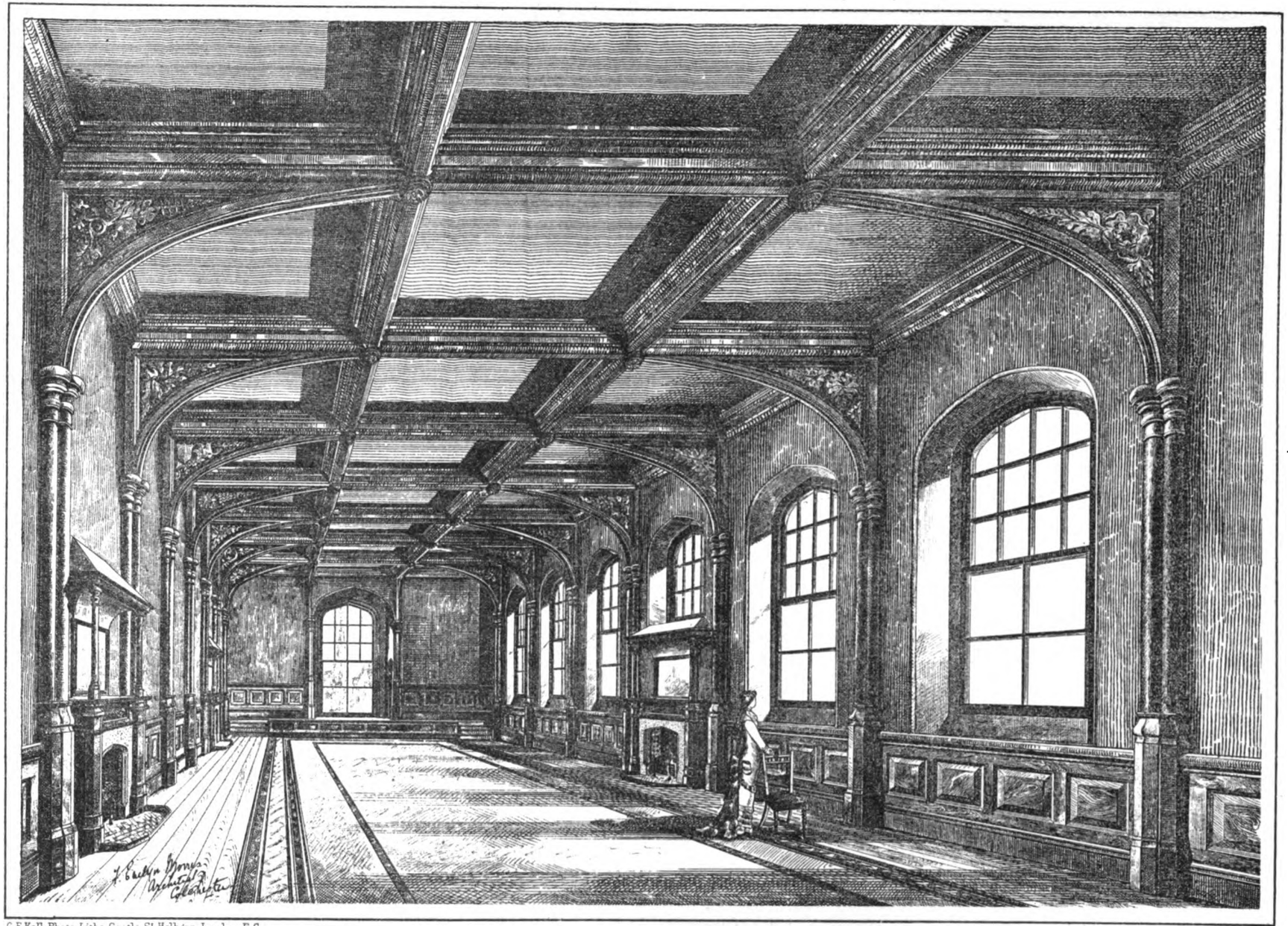

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PROPOSED ASSEMBLY ROOM
OLD RED LION HOTEL. COLCHESTER.

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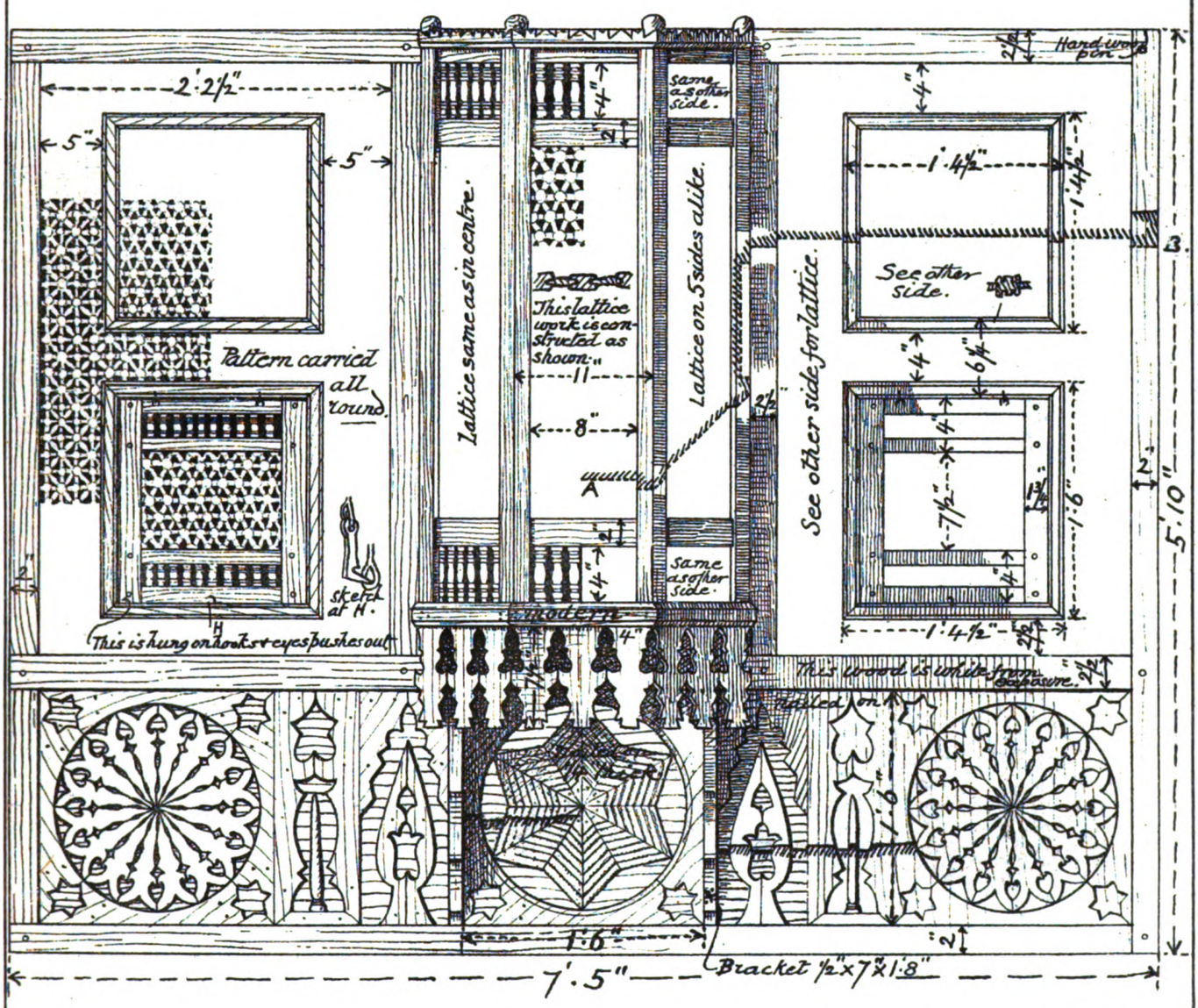
Window Screen from Cairo. 17th or Cent.ry

Now at S. Kensington.



Walter Aston.
Mons. & del.t May 27th/82.

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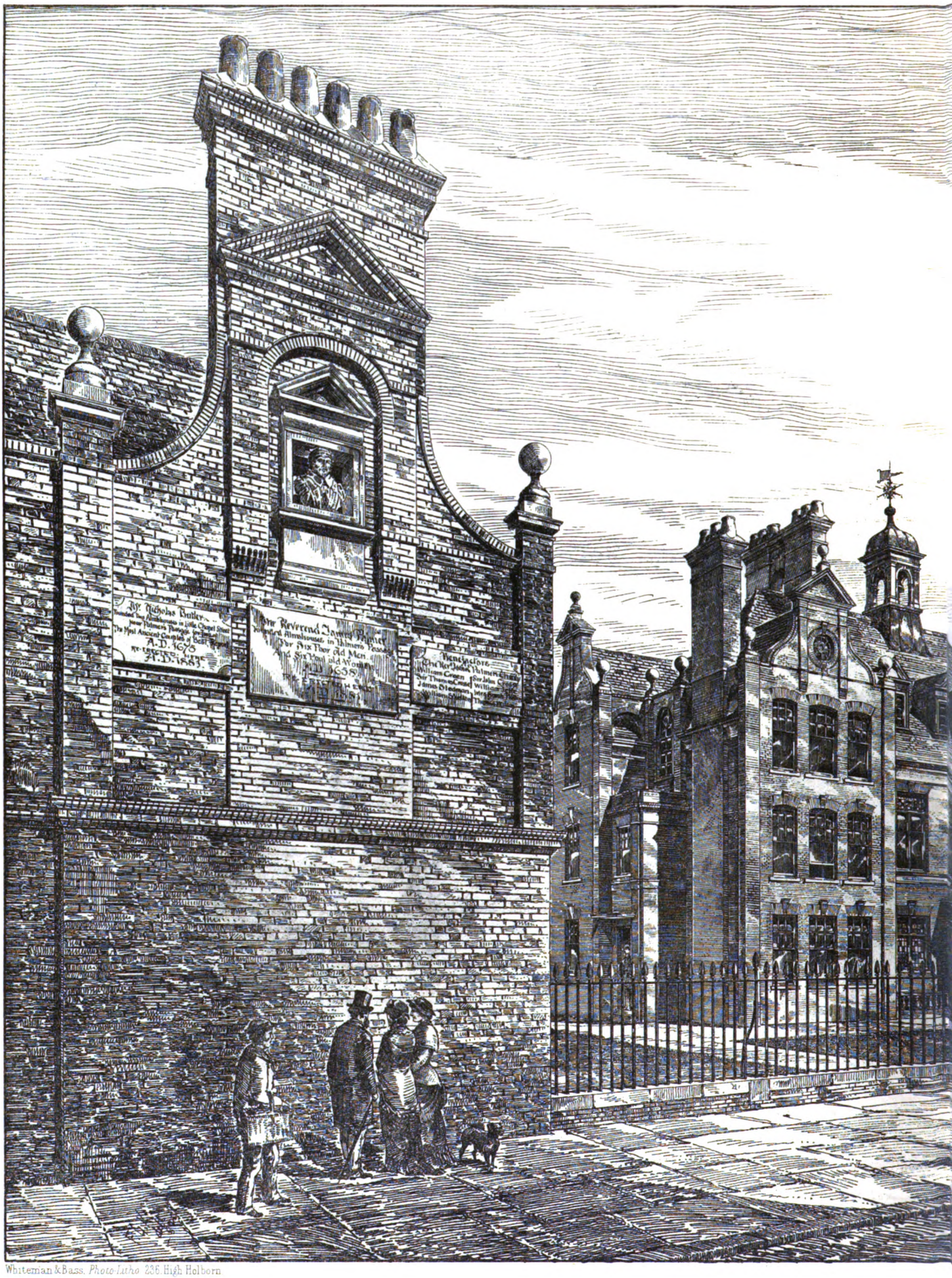

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ASSEMBLY ROOM, LION INN, COLCHESTER.

THE Assembly Room to be built at the Old Red Lion Inn, High-street, Colchester, of which my drawing is an internal view, is part of a large addition now being carried out under my direction for the owner, Mr. W. Wilberforce Daniel. It has been designed in character with the house, one of the few remaining examples of Domestic Tudor buildings in the country.

It was probably built about 1470 as an inn, but I can find no mention of it prior to 1529, at which date it had its present name, but, I should imagine, had been renamed somewhat prior to that date, as the spandrels over the entrance-gateway are filled in with very bold carvings of St. George and the Dragon, from which I infer that was the original sign of the house.

In carrying out extensive restorations during the past two years I have found (covered up some seventy years since) many beautifully-moulded beams, floor-joists, carved corbels, &c., and the greater portion of the first-floor front to the street covered with oak tracery panels in a very good state of preservation, but now covered with lath and plaster, but which I hope eventually to uncover and restore.

The whole of the internal and external walls above the basement are constructed of oak and chestnut timbers filled in with wattles and clay.

At some future time I will ask you to kindly publish a drawing of the street front as restored, it being, I think, a very interesting example of fifteenth-century timber construction.

F. EVELYN MORRIS.

THE UNITED WESTMINSTER ALMSHOUSES.

WE give a view of the new Westminster Almshouses. They are intended for eight married couples and eighteen other persons of good character, not less than sixty years of age, who have been resident in the united parishes of St. Margaret and St. John the Evangelist, and have been erected in pursuance of a scheme of the Charity Commissioners, dated 11th July, 1879, which consolidated the Ancient Almshouse Charities, founded and endowed by the Rev. James Palmer in the year 1656, by Mr. Emery Hill in the year 1708, and by Mr. Nicholas Butler in the year 1675, the Charity of Mr. Emery Hill having been generously endowed, in the year 1859, by the late Mr. James Chadwick, an old inhabitant of Westminster, with the sum of 1,500*l.* new 3 per cents, and by his widow with the like sum of 1,500*l.* in the year 1860, in order to increase the monthly allowances to the inmates. When originally founded, Palmer and Hill's Charities had attached to them schools for the instruction of a certain number of boys, but by the Endowed Schools Act, 1869, the scholastic branches and nearly one moiety of the endowments of these two charities were transferred to the United Westminster Schools, and thereupon Mr. Frederick Seager Hunt, the treasurer of Palmer's Charity, the late Mr. Wm. Freeman, the treasurer of Emery Hill's Charity, and Mr. Edgar Horne, the chairman of the Trustees of Butler's Charity, came to the conclusion that it would be to the interest of the charities that the three Almshouse Branches, some of which were occupying very valuable sites, should be amalgamated, and they accordingly brought the matter before their respective Boards, who at once concurred in an application being made to the Charity Commissioners for a scheme for that purpose, which met with the entire concurrence of the Commissioners.

The trustees sold the freehold sites of Palmer and Butler's Almshouses in Victoria-street, in May, 1880, which enabled them to purchase the freehold of the site of Emery Hill's Almshouses, on which the new Almshouses have been built. The site had been previously held on renewable leases from the Dean and Chapter of Westminster, but whose power of renewal had lapsed by the transfer of their property to the Ecclesiastical Commissioners.

The new buildings were commenced in May, 1881, and provide for the same number of almspeople as the old foundations, with the great advantage that the almspeople have two rooms each instead of one, and after providing for their comfort in every way, and a separate laundry and drying-room, so as to supersede the necessity of washing in their living-rooms, and a sum of 100*l.* a year for exhibitions in compliance with Mr. Nicholas Butler's will, the trustees have already been enabled to grant pensions of 20*l.* a year to eighteen persons living with their relatives and friends.

The building consists of a centre and two wings. The south wing contains twelve almshouses, to accommodate the number maintained in the old Palmer's Almshouses. The north wing contains twelve almshouses, to accommodate the number maintained in the old Emery Hill's Almshouses; and the centre block contains two almshouses, to accommodate the two married couples formerly maintained in the old Butler's Almshouses, besides the board-room and offices, the rooms of the superintendent, who is to be responsible for the internal management of the almshouses and the comfort of the almspeople; also a separate infirmary, and apartments for the nurse.

The buildings have been erected by Messrs. Adamson & Sons, from designs by the late Mr. Robert Richard Arntz, upon whom they reflect great credit for the thoughtfulness and care exhibited. Since the lamented death of Mr. Arntz, Mr. Cole A. Adams, who had been associated with him in preparing the plans and drawings, has superintended the completion of the buildings, with the assistance of Mr. Thomas Higgs, the clerk of the works, to the entire satisfaction of the trustees.*

THE ARCHITECTURAL AND ENGINEERING CONGRESS AT HANOVER.

THE fifth congress of the Union of Architects' and Engineers' Societies (which has just been held at Hanover) was arranged two years ago, and during the interval the worthy burghers of that city have been keeping before them the important nature of the event. On a previous occasion in 1862, there had been a meeting of a similar character at Hanover, though it was apparently before the incorporation of the body which summoned this congress. The importance of Hanover as a centre of artistic influence has increased of late years, Herr Schaper having contributed, by his mural decoration of the restored town-hall, towards the result thus arrived at.

The preliminary assembly of delegates (forty in number, from nineteen societies) met on the 18th ult. After some business of a formal character had been transacted, a resolution was adopted asking the Hamburg Society to prepare specimen forms of contracts made with architects. It was also resolved to ask the Government to publish in their present form the details of public buildings in Germany which have lately been collected. The better and more economical employment of water, from agricultural, industrial, and commercial points of view was likewise discussed. A commission was appointed to report on the best means of preventing the profitless expenditure of architectural work which sometimes takes place in public competitions. The question of normal regulations for the delivery of iron constructions was referred for special discussion to the Saxon Association of Engineers and Architects, which had already been dealing with the subject. The question of technical education in connexion with architecture was the subject of lengthy deliberation. Reports were presented on the subject from Munich, Hamburg, Hanover, Stuttgart, Cologne, and Schleswig-Holstein. The present system was generally considered as being unsuitable to existing requirements.

At the second assembly of delegates, which took place on the 19th, Herr Kohler alluded to the proposed restoration of the castle at Heidelberg, and mentioned that the renovation of this monumental work would be an appropriate gift from the German nation to the University of Heidelberg, on the 500th anniversary of its foundation which it will be celebrating in 1886. The question of utilisation of water which had been brought forward on the preceding day came up for further discussion, and was referred to a select commission. The unfavourable position in which young architects are at present situated in Germany was the subject of a special report from the Berlin Society. According to the particulars brought forward, the overcrowded state of the profession becomes painfully apparent when any official position is being competed for, and the opinion is ventured that this state of things is likely to grow worse rather than to improve, unless the extensive publication of the facts of the case serves to deter candidates for admission to the profession from continuing their efforts in that direction. The suggestion was also made that the suspension of works of a public character should be so arranged that a larger staff of technical men should be employed. The use of glazed tiles for roofing and facing purposes, and the system of normal models for rolled iron, were also discussed. The further elucidation of the subject of "Typical Dwelling-house Plans" was entrusted to the Mid-Rhenish Society. A question of special interest was also brought forward with reference to the effect of the season at which wood is cut, on its quality and durability. The proposal to erect a monument to Semper was approved, and the proceedings of the delegates then terminated.

The festivities which took place on Sunday, the 20th, in connexion with the reception of the guests, were characterised by the heartiness of friendly feeling which the occasion inspired. The railway station is well known to travellers in North Germany as being one of the best specimens of its kind on the Continent, and being provided with the electric light, was striking in its general appearance. The addresses of welcome, delivered at the Rath-haus by Herr Culemann and Professor Lange, were appropriate in their character.

On Monday, the 21st, the business of the Congress commenced in earnest, under the presidency of Herr Köhler, the secretaries being Herr Sprengell and Herr Demanget. The first paper was read by Herr Kyelmann, upon "The Value of Exhibitions for Technical Purposes." He referred to the technical skill developed in the construction of suitable buildings, and contrasted the principles which have guided French and English architects in the general internal arrangements of such structures. The Paris Exhibition of 1878 he considered as having been specially valuable to the cause of architecture, inasmuch as it enabled the careful observer to note the pervading features of the art in its modern French form, and, at the same time, gave due prominence to details affecting the restoration of Mediæval structures. Another useful feature of the display was the facility of contrasting the iron constructions of various nations. As a general argument, he maintained that the careful and intelligent arrangement of objects not absolutely novel was often of more practical use than the exhibition of articles, which, though new, were not placed with due discrimination and knowledge of their relations to surrounding objects. In conclusion, he remarked that the too great abundance of exhibitions which had existed was being remedied, and while advocating special exhibitions in preference to those of a comprehensive nature, he expressed himself as opposed to such special displays as sought to cover too wide an expanse of science, art, or industry, considering that the more limited the scope, the better was the prospect of the advancement of technical progress in the direction selected for illustration.

The work of the sections commenced at noon. That of architecture occupied itself in the first instance with Herr Hase's paper on German town-halls in general, with special reference to that of Hanover. There are, it would seem, not many old town-halls in Germany, and none of them have retained their original form without alteration. The oldest is that of Dortmund, which dates from the twelfth century, and in which provision is made for festivities and public assemblies, as well as for the administration of justice. That of Gelnhausen has some points of resemblance with the Dortmund structure, and dates from the same period. That of Lubeck (which as early as 1276 suffered from a fire) shows the influence of Italian art in its general character, this fact being explained by the important commercial relations existing between that city and the ports of Southern Europe. The remains of this notable building enabled Viollet-le-Duc to complete his studies as to the architectural features of town-halls of the period named. The edifices at Stralsund and Rostock partake to a certain extent of the general features of that of Lubeck. In Dantzig, however the town-hall is of a different style of

* The following are the names of the trustees of the Almshouses:—Mr. Frederick Seager Hunt, chairman; the Venerable Archdeacon Jennings; Sir Henry Arthur Hunt, C.B.; Mr. John Lettsom Elliot; Mr. James Alfred Hallett; Mr. George Taverner Miller; Mr. Herbert Thos. Steward; Mr. Geo. Andrew Spottiswoode; Mr. Jos. Carter Wood; Mr. Edgar Horne; Mr. Wm. Goldsmith; Mr. Geo. Burt; Mr. Geo. Francis Trollope; Mr. Thos. John White; Mr. R. Selby Freeman; and Mr. William Mann Trollope, clerk and solicitor to the trustees.

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architecture, dating from the early part of the sixteenth century. It has a tower, such as is found in similar buildings constructed about the same time. This structure seems to have been designed for judicial and municipal purposes alone, there being no provision for banqueting-rooms, &c., in its architectural arrangements. The custom seems to have sprung up about this time of building a hall for festivities close to the town-hall. The Luneberg building is, however, an exception in this respect. The town-halls of Göttingen, Einbeck, and Duderstadt were alluded to as being picturesque in their general plans. The town-hall of Hanover was referred to in special detail. One of the wings dates from the year 1435, and the façade towards the market-place from about 1470. The thirty years' war was injurious to the general prosperity of the district, and the town-hall was allowed to get into a condition which necessitated the restoration commenced in 1654. It had been proposed some twenty years ago to build a new town-hall, but at the urgent instance of the Union of Architects and Engineers the restoration of the old building was determined upon, the artistic success of the work being too well known to need detailed comment.

The Engineering Section was occupied with the discussion of the best means of regulating the stream in the case of navigable rivers, the treatment of the subject having special reference to the Weser. Professor Fränkel described his invention for indicating the tension of different parts of a building under various degrees of burden.

In the progress of the discussion as to the prevention of danger from fire in theatres, Herr Unger urged the necessity of a legislative basis for the regulation of architectural matters affecting theatres. Herr Giese pointed out that no progress of an important nature had been made of late years in the machinery of theatres. Further deliberations on the subject were entrusted to a select commission of delegates. Before the close of the Congress this body reported on the advisability of a proper code of rules being adopted by the German Parliament, which should be drawn up by technical authorities versed in the different branches most interested, such as architecture, stage machinery, theatrical arrangements in general, fire extinguishing, &c.

The engineering section was particularly active during the entire congress. The subject of the flexion of iron bridges was discussed with special reference to the periodical inspection of such structures for the purpose of avoiding catastrophes. The Central Union recently submitted a scheme for this purpose to eight different governments and fifty-five railway administration. The answers received (from about one-third of the companies thus addressed) show certain differences of opinion on the subject. One company has for years taken steps of a similar character to those recommended. Another thinks them too detailed, and only needful in the case of new bridges. Others have been themselves framing regulations on this subject, which will, in one instance, be replaced by the new scheme. Several companies express their appreciation of the plan, which they intend to adopt. The most suitable interval between these periodical examinations is thought by various administrations to be from three to five years, the latter term being specially applicable to small bridges. The methods of testing the flexion seem to be varied in their character, as also in the manner of applying the weight. Some companies employ an ordinary goods train, but in most cases two locomotives are placed with their fore parts together, and with goods trucks attached. A third engine is sometimes added, but in such cases it is empty. Many of the companies which have furnished such particulars precede the trials with moving weight by a test lasting five minutes with weight not in motion. A proposal made by Dr. Fritzsche, of Dresden, that the importance of uniformity in the tests applied should be represented to the various railway companies, was adopted.

An important paper was read by Professor Inze, of Aix-la-Chapelle, on the use of steel for building purposes, in which he attributed its limited employment to the reluctance of the profession to use a material the merits of which had not been fully ascertained. He alluded to the progress German steel manufacturers have been making of late years, and stated that exports have been made to England for Admiralty purposes. As to the application of steel to building purposes, he remarked that recent trials in England had resulted favourably, while the extra expense of steel against iron was, in some instances, of a relatively unimportant character.

The Congress was noteworthy for the important part which out-of-door work occupied in the proceedings. The various interesting architectural features of Hanover were the subject of special attention.

The visits paid to Brunswick and Bremen by the Congress were also of a highly interesting character, and amply repaid those whose zeal in the cause of professional science induced them to take these two railway journeys in addition to that which had to be undertaken in the first instance to reach the scene of the Congress itself. The usual festal adjuncts were not wanting at any of the points named.

In connexion with the Congress an exhibition took place of the plans sent in for the competition which recently took place for the building of the German Reichstag's new abode. This exhibition was numerously attended, not only by those who had come to the Congress, but also by the public at large.

THE BRITISH ARCHÆOLOGICAL ASSOCIATION AT PLYMOUTH.

RESUMING our notes * of last week's archæological congress at Plymouth, we proceed to go a little into detail as to Wednesday's proceedings, already briefly mentioned. The excursion for the day was to Dartmouth and Totnes. At Dartmouth, St. Saviour's Church was commented upon by Mr. Loftus Brock, who pointed out that the west end corresponded to the date of dedication, and that the east end corresponded to the time of Hawley. The main walls, however, appeared to be of an earlier date. The figures on the pulpit had been taken out, and the emblems and arms of Charles I. inserted. There appeared to be many dates scattered over the church, and the date of the ironwork on the south porch was much discussed, and generally agreed to have been inserted at the time of some repair. The handsome rood-screen was generally admired for the variety of its tints and intricacy of its workmanship. Mr. Brock directed the attention of the visitors to the altar-piece, by Brockedon, the Totnes artist. On the floor of the chancel the fine brasses were subjected to no small amount of scrutiny and impromptu observations offered by Colonel Bramble. On leaving the church the visitors proceeded to inspect the picturesque old houses in the Butterwalk. Sir James Picton was of opinion that they could certainly not be older than the reign of Elizabeth. Many of the visitors went to the castle, and a small section mounted the hill to see the old church.

The afternoon was devoted to Totnes, where the large granite pebble known as "Brutus's Stone" was inspected. Tradition alleges that on it Brutus of Troy landed, but Mr. Edward Windeatt, a local antiquary, did not appear to cherish a vast amount of respect for the tradition (the baselessness of which, if we mistake not, was demonstrated by Dr. Freeman some years ago), in spite of the fact that it has, for a long period, been customary to proclaim from this stone the accession to the crown of a new Sovereign. Thence the visitors wended their way to East-gate,—one of the four original gates, of which two only now remain. The East-gate, which has been much modernised, formerly consisted of two arched portals,—one for carriages, which was enclosed with gates, and a smaller one, "a needle's eye," for foot passengers. It was the room over the gateway, however, which most enchanted the spectators, there being there a beautiful specimen of the Early Renaissance in the form of a fine coloured carved frieze above the linen panelling, and surrounding the room. The frieze Mr. Brock took to be of sixteenth-century date, and of French or Flemish workmanship. Mr. Windeatt observed that this theory would correspond with the fact that about the time mentioned the merchants of Totnes had considerable dealings with the French and Flemish, and Mr. Brock added, that there was even now carried on a very considerable trade in old carvings from France and Flanders. At Totnes Church the first point that engaged attention was the fact that the fabric was built of red sandstone. It is curious that there is no other red sandstone building within five miles. The red sandstone in this case appears to have been brought up the river in boats,—a theory supported by the fact that in dredging large blocks of red sandstone have been found in the river. According to Mr. Windeatt, who acted as guide, the earliest notice of the existence of a church in Totnes is in a charter of Judhel de Totnais, the Norman Baron to whom the Conqueror granted the borough, by which he grants the church referred to in the charter as "ecclesiam Sancte Marie de Totenco" to the great Benedictine Abbey of St. Sergius and St. Bacchus at Angers. The church appears to have been rebuilt, and the new one consecrated by Bishop Bronescombe in 1259. The church was again rebuilt about 200 years afterwards, Bishop Lacy, in 1432 granting an indulgence of forty days to all who contributed to the work. Over the outer doorway of the south porch are the remains of an ancient sun-dial, and what appears to have been three coats of arms. The higher one has the appearance of being the town arms. The inner doorway has over the remains of a saint's niche, and a shield with the arms of Bishop Lacy. About half-way up the fine old tower are three niches containing figures. The centre one is supposed to represent Bishop Lacy, and under the figure, in raised letters,—"I made the Tour." One of the principal objects of interest in the interior is the very handsome carved stone rood-screen under the chancel arch, with two parclose screens. It appears from some ancient documents, that in 38 Henry VI. an order was made by the Corporation (who up to 1836 had control of the church), that the chancel should be divided from the church with freestone, as the cathedral church at Exon was." This screen has recently been restored. The Corporation stalls, which are handsomely carved, were erected in 1636, and stood in front of the screen; they now face the entrance transept. In the south wall of the chancel is a hagioscope, and on the north side a fine rood turret, with stone staircase leading to the rood-loft; the base of the turret has the remains of two piscinæ. In the south aisle were noticed the remains of a Perpendicular tomb, to the memory of Walter Smith, who died in 1555. Under the tower arch is a marble monument to the memory of Christopher Blackhall and his four wives. It formerly stood on the south side of the chancel, but has been moved during the restoration to its present position, and Mr. Brock condemned the change in no measured terms. A kneeling figure, with hands clasped, represents the husband, who died in 1635, and beneath are the kneeling figures of his four wives. The restoration of the church had been conducted by Sir Gilbert Scott on such commendable lines that it was with some difficulty that Mr. Brock could bring himself to utter his censure. An adjournment having been made to the ancient Guildhall of the borough, where the visitors were cordially welcomed by the mayor (Mr. Edward Harris), an inspection was made of the old charters, seals, maces, cups, &c. From the Guildhall the visitors went to the castle of Totnes, which has a circular keep situate on a lofty mound.

On Thursday there was an excursion to the Tavistock and Lydford district. Arrived at Lydford Church, Mr. Brock remarked that its tower was altogether different from anything the Association had yet seen in Devon, and the plan was that of a very ancient building. Having examined the exterior, he found structural indications that the western part never formed a portion of the original building, and it was very possible that the original church consisted only of a simple nave and probably a small chancel. The western part was of the date of the south aisle itself. They had within the walls of this very simple little building evidence of how the growth of the church must have commenced thus from smaller things than we saw now. The tower was built some 2 ft. away from where the old western wall formerly existed. On the north side there were evidences of the outside jamb, the quoins being visible. The builders of the tower, like wise men, erected it so that it would not interfere with the services of the church. With respect to the age of the church, he would not venture to assign a date to the rough walling on the north side where the original wall commenced, because it might be of very great antiquity indeed. Taking the font, however, as evidence of its workmanship, it appeared to be of very early Norman date, but the researches

See p. 283, *ante*.

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which had been made into our old fonts of recent years has shown us several fonts of Saxon date not at all unlike the one here. The windows on the north side of the church were insertions of about the middle of the fourteenth century. To the whole of the remainder of the church,—the beautiful western wall, and the south aisle,—they might assign the middle of the fifteenth century. The tower was particularly interesting, and he commended it to the special notice of the visitors. It was built entirely of granite, and the work was massive and good. The dilapidated condition of the roof Mr. Brock did not suffer to escape his attention, and suggested that it would give the custodians of the fabric some trouble before long. On leaving the church the visitors proceeded to Lydford Castle, where Mr. Worth, F.G.S., undertook to guide the party. There was, he said, no more suggestive site in Devonshire, because they had direct evidence in the earthworks that they were standing within the precincts of one of the great forts of the Damnonii. The church was dedicated to St. Petrock, one of the Saxon saints, which indicated that the origin of Lydford was very early. The castle was surrounded on all sides by valleys, and the point was one of the strongest that could be selected, the earthworks being the most formidable in the county. The place was of such importance in the Saxon times that a mint existed there, and there were in existence several specimens of pennies dating from Saxon times. Before Plymouth existed the Saxons came up and destroyed the mint at Lydford. Whether Lydford itself was destroyed they had no evidence, but its inhabitants must have rapidly recovered themselves if it was, because, in the reign of Edward the Confessor, there was only one town which surpassed Lydford in importance, and that was Exeter. In answer to inquiries, Mr. Brock said that probably much of the existing stonework only dated back as far as the time of King John.

At Tavistock the excursionists found a substantial luncheon awaiting them, provided by His Grace the Duke of Bedford. This having been partaken of, and the Duke's health toasted, the party adjourned to Tavistock Church, upon which some observations were offered by Mr. Brock, who said that the first date found in connexion with the church was 1184, when an important record was discovered which made it clear that the fabric existed in 1134, dedicated to St. Eustachius. The next date found was 1318, when the Bishop of Exeter dedicated the church, which had apparently been rebuilt at that time. He regretted with Mr. Rundle that many rare old documents had been destroyed, in one of which mention was made of a payment to the sacristan of the monastery. Here, as at St. Andrew's, Plymouth, remarked Mr. Brock, the architecture fitted in very badly with the dates. The south aisle he took to be the aisle of St. Thomas-à-Beckett. It was curious to find in the building occasional traces of the work of the fourteenth century. There was evidence that the church must have been all but remodelled a little later. The building itself exemplified all the points to which he had drawn attention as characteristic of Devonshire churches. There was no clearstory, there was the pointed barrel roof, the windows were broad and lofty. There was a chancel arch, which was a usual thing, and there was a western tower, which was a very unusual thing. At the east end they would see fragments of older work. Their experience led them to believe that in these western counties, when Saxon England was under a cloud of heathenism, there existed Christian churches. It was surprising to find that in Devon and Cornwall there were more churches dedicated to the older saints than were to be found in any other part of the country. Escorted by Mr. Brock, the visitors next proceeded to view the site and remains of a church which was probably as large as Exeter Cathedral—Tavistock Abbey. The extent of the space occupied by the buildings, cloisters, and courts had been ascertained from old rentals, in which a certain area is designated as the "Abbey Scite." The remains of the abbey, from the precincts into the gardens, orchards, &c., which probably were extensive, as considerable traces of ponds (perhaps the fish-ponds) were found when the foundations were being excavated for the houses now standing there. The old boundary-walls enclosing the abbey site,—those facing the river,—having a walk formed on it just below the battlements. A tower-like building of two stories at the south-west corner of the abbey, which has always been known as the Still House, was much admired, the upper story having been entered from the walk on the south boundary-wall. It has been much altered on the inside. The building now used as the Unitarian Chapel Mr. Brock thought to be undoubtedly the refectory. The stone niche or pulpit in the north wall, where the reader at the meal times of the monks was placed, was removed not a great many years since. The original roof still remains, hidden by the plastered ceiling, but the mouldings of the purlins and the ornamental portions of the principal timbers, which projected before the line of the circular ribs, have been cut away. Considerable attention was paid to the entrance to the refectory, with a groined ceiling of stone, and a chamber over, which was formerly approached by a circular stone staircase. This chamber had a handsome oak roof, with trefoiled principles, now much decayed. It is proposed to make a *fac-simile* restoration of roof. Passing on, Mr. Brock indicated the position of an oblong building, the last portions of which were removed about seventy years since, which had been considered to be the kitchen. From what Mr. Rundle had heard from old inhabitants it probably had at one time an upper story. The archway of the site of the watergate had been taken down within Mr. Rundle's remembrance. It was a low four-centred arch of granite, of about 8-ft. opening, and was shown in some old engravings of the remains of the abbey buildings. Formerly there was a ford across the river at this spot, the bridge and weir being of modern construction. Tavistock had, up to the middle of the last century, only two bridges across the Tavy. The east bridge (now destroyed), which was situate some distance above the abbey, and is shown in old engravings of the town as having several pointed arches; and the west bridge now existing, but much modernised, near Fitzford. Nothing of the interior of the upper story of the town gate is left, and the roof is modern. It must have been an apartment of considerable importance; the stone staircase, now taken away, was in the tower at the south-east corner. From what Mr. Rundle had seen at various times when excavations have been made in the road in front of the Bedford Hotel, he felt that he would not be far wrong in saying that there stood the abbey church. The arch, of Early English date, now standing in the churchyard might have been a part of the north side. Encaustic tiles have been found, forming portions of the floor, at about 7 ft. or 8 ft. below the present surface, and near the eastern end a large slab of stone was come upon which seemed to have formed the top of a tomb, and had an abbot's staff carved upon it. Pieces of white Beer stone, richly carved, which looked like portions of tabernacle work, have also been dug up. When old houses in the town, built about the middle of the seventeenth century, have been taken down, numbers of blocks of stone, parts of cusped tracery, foliated capitals of columns, and arched panellings have been discovered built into the walls. These are almost all of them Early English or Middle Perpendicular in style. There is a tradition that the chapter-house was where the present Bedford office is now placed. The outer walls were pulled down in the beginning of last century for the sake of the stones, which, it is said, were used for some erections, now part of the Bedford Hotel. In the construction of the abbey, granite was extensively employed for the pinnacles, windows, staircases, &c., but the bulk of the walls, all the squared ashlaring, much of the tracery of windows, carved caps of columns, and ribs and filling of the groining were made of a compact trappean ash stone, found about two miles from Tavistock. It was a very durable stone. In the more delicate work of the interior of the church a white stone, coming from Beer, was very extensively used, as evidenced by the quantities of pieces of finely-carved work which have at different times been dug up or found embedded in walls built since the dissolution of the monastery. Some of these were richly gilt and coloured.

At an evening meeting held on the return of the excursionists to Plymouth, Mr. J. Phillips read a paper on Abbotskerswell Church, in which it was stated that in the course of recent examinations of the church for the purpose of restoration, (which is about to be undertaken under the direction of Mr. Butterfield), there was discovered, beneath plaster and whitewash, a much mutilated figure or effigy, offering various points of interest and speculation as to its purport and date. For this latter, and comparing it with others, it may pass as contemporary with the later portion of the church, and a most singularly graceful and accomplished piece of sculpture it has evidently been. In height it stands about 7 ft. It is completely hollowed out at the back, so that there is now probably nowhere more than a thickness of 4 in. The stone may be Purbeck freestone, but Mr. Phillips thinks it is not unlike that which is raised near Amiens. The head has been encircled by a sculptured crown, with a fillet, in which are ornaments representing precious stones. From beneath the crown fall massive tresses of hair, brought out with unusual elaboration in the sculpture; also from beneath the crown depends a veil at the back. The robe falls in folds to the ground, and has been elaborately decorated, both in a light and also in a black pigment. The sculptured crown of the head has been for the most part cut away. Mr. Franks, of the British Museum, to whom a sketch was sent, could only compare it to the crown of Richard Cœur de Leon in the Cathedral of Rouen. The present position of the figure is very puzzling. It was suggested that at the rebuilding of the church by the abbot and monks of Sherborne, to whom the history of the Lady Œdelhild must have been familiar,—as the first mention of the parish is in a cartulary of their abbey, and concerning whom they probably had more information than has reached us,—they desired to commemorate the munificence of the royal lady who founded the church, which had become one of their benefactions.

The other papers read were on "The Antiquity and Antiquities of Plymouth," by Mr. Worth,—and as to which the Rev. W. Lach-Szyrma lamented the destruction of Old Plymouth,—and on a Plymouth hero, "Robert Blake, Colonel and General at Sea, 1657," by Mr. E. G. Bennett.

On Friday there was an excursion to Dartington, Berry Pomeroy, and Compton Castle. Dartington Hall, the seat of Mr. Arthur Champernowne, was first visited. Mr. Brock pointed out that the plan of the building was like most of the Domestic houses of the period. It consisted of two quadrangles. The larger of the two, the remains of which still exist, had the domestic offices on both sides of it. The second quadrangle was smaller, and consisted of the best apartments. The work that remained was undoubtedly of the time of the rebuilding of the hall by John Holland, Duke of Exeter, the style being the Transition from the Decorated to the Perpendicular. The mullioned and transomed windows in the tower were no doubt Elizabethan insertions; and the battlements and some of the corbels beside the tower were, he understood, rebuilt by Pugin some years ago.

Berry Pomeroy Castle was treated of in a paper read by Mr. Lynan, who stated that the structure was of the Edwardian period. Mr. Myers spoke of the care which was evidently taken of the ruin by its owner, the Duke of Somerset.

At Compton Castle attention was called to a paper by Mr. Gordon Hills in a past volume of the *Journal* of the Association.

At the evening meeting in Plymouth an interesting paper on "The Old Cornish Tongue and its Remains" was read by the Rev. W. S. Lach-Szyrma.

On Saturday there was a carriage excursion to Slade Hall, Cornwood Church, Fardel, near Ivybridge, and Plympton. At Slade Hall extracts from Risdon's "Survey of Devon" were read appertaining to the building and to Fardel.

Cornwood Church was described by Mr. Brock as one of the most instructive churches to study which the visitors had seen during their tour. I think (he went on to say) we may trace here the gradual development of the church plan from a building comparatively small to one of the present size. The nave I take to be the original form of the church, with, as in this case, the addition of a western tower. The western tower survives; but nothing of the little nave remains. The tower, therefore, of this church is the oldest part; and it is of early date, say,—for the purpose of fixing a date,—A.D. 1160 or 1170. The work is, therefore, semi-Norman in its character, the belfry windows being semicircular-headed, and the little tower arch pointed. The remainder of the building, like so many of the Devonshire

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churches, is in the Perpendicular style. I can scarcely trust myself when I find flowing Decorated windows in the walls. They are modern, like so many other portions of the building. The pillars between the aisles and nave are very curious, built of granite, and one stone forming each shaft. Following the usual arrangements of these Devonshire churches the older parts are built of rag stone, and the later parts of granite. There are some pretty monuments here. I am glad also to find that the old Jacobean or Elizabethan pulpit has been retained, and a very pretty example it is.

At Fardel, Mr. George Wright read a paper discussing the question whether Sir Walter Raleigh was born at Fardel. He said:—We are now looking upon a spot where much of his early life was passed, and the associations connected with his name become all the more vivid, and the picture, as it were, of the great past in which he was so intimately concerned rises before us. Lysons, in his "Magna Britannica," says:—"Fardel was, in the reign of Henry II., the property of Warren Fitz-Joell, whose heiress brought it to Newton, and the heiress of Newton to Raleigh, of Smallridge. The manor belonged, in the reign of William the Conqueror, to Ralph de Pomeroy, and afterwards to the Mohuns. In the reign of Henry III. it became the property of Wymand Raleigh, a younger son of the Nettlecomb family, an ancestor of Sir Walter Raleigh, whose grandfather, Wyman Raleigh, conveyed the manor to Sir Nicholas Hyde, Chief Justice of the King's Bench. Fardel was one of the principal seats of the Raleighs, and it was supposed, though erroneously, that the celebrated man of whom I have been speaking was born there. Fardel was, without doubt, his occasional residence. His father was the first of the name that lived there. A letter from Sir Walter Raleigh to one of the Duke family was, a short time since, to be seen at Ullerton House, pasted on a little board for its preservation, with a glass over it. East Budleigh, Poer Hayes, since called Duke's Hayes, was the property and residence of the ancient family of Poer, whose heiress brought it to the Dukes. The old mansion at this place is celebrated, says Lysons, as the birthplace of Sir Walter Raleigh, whose father had a long lease of it under the Dukes, and here, in 1552, the celebrated Sir Walter Raleigh was born. In the letter referred to, dated from the Court, July 26th, 1584, addressed to one of the Dukes' family, he expresses his wish to purchase this place, observing that from the natural disposition he had to it, having been born in the house, he would rather seat himself there than anywhere else.

From Fardel the company drove to Ivybridge, and dined together at Mallet's Hotel. On the return journey to Plymouth a halt was made at Plympton, and a couple of hours agreeably occupied in inspecting the old castle and the two churches of St. Mary and St. Maurice, Mr. Brooking Rowe giving an interesting address in reference to the origin and probable date of the castle ruin, and the chief architectural features of the two churches. A brief visit was paid to the Plympton Grammar School, the birthplace of Sir Joshua Reynolds, and also the place where the two other eminent artists, Sir Charles Eastlake and Benjamin Robert Haydon, received their early education.

On Monday last, Port Eliot, St. Germans, and Trematon Castle were visited.

UNWRITTEN HISTORY:

HOW TO READ IT.

THIS was the subject of an interesting discourse given in the Skating Rink, Southampton, last week, by Dr. John Evans, F.R.S. It was a lecture addressed to the townspeople, and attracted a crowded audience.

Dr. Evans commenced by expressing his approval of the custom, observed now for some years, for one of the members of the association to be deputed to deliver a lecture to the operative classes. Such an occasion afforded a good opportunity of treating some subject which lay within the range of all observers of what was going on in the world and which might be of local interest. It was not easy to find such a subject; yet if he spoke of those who in remote times had lived and laboured in this part of the globe, he should have a theme of general human interest. If, in addition to giving particulars of their mode of life, he pointed out the methods by which our knowledge of the manners and customs of remote antiquity was obtained, he should assist his hearers to appreciate the value of the application of scientific methods to the study of the past, and to feel that our knowledge of antiquity rested upon something more secure than vague conjecture. The neighbourhood was the home of some of the witnesses he would call. Our best evidence of what must have been the condition of occupants of the earth without the most simple appliances of modern civilisation was to be found in the relics of the past found buried in the earth. The town was formerly known as Hamtune, and Northampton had the same name; and North and South were prefixed for distinction. Ham was home, and Tune was probably derived from the name of the river in each case. Going back beyond the Roman occupation of the island we entered the border of the domain of unwritten history. The ancient Britons had coins; particular forms had been found in particular districts; the inscriptions on some determined the names of British princes and the districts in which they reigned. In Hants and Sussex were found coins struck by two princes as to whom written history was silent. In the southern counties, and especially in Kent, coins had been found which were, no doubt, imitations of those made by Philip, the father of Alexander the Great. There was evidence of an uninterrupted succession of coins copied the one from another. The coins justified us in saying that the Southern Britons were sufficiently civilised to make use of a coinage 150 B.C., or a hundred years before Cæsar came. Besides coins of gold, silver, and brass or copper, with devices derived from Gaulish copies of a Macedonian original, there were others cast in tin with devices in imitation of some coins of Marseilles. Many of these had in relief the grain of the wood in which they were cast. They had been found with iron tools and weapons near Lewes. In graves which must have belonged to the first few centuries before Christ there had been found swords of iron, with ornamental bronze sheaths. It was the custom to bury with the dead a number of ornamental or useful objects, and in graves in the Austrian Tyrol had been found swords with hilts of ivory inlaid with amber, daggers with golden sheaths, helmets, girdles, bracelets, brooches, and vessels of bronze. In other graves have been found swords, spear-heads, and hatchets of bronze, of which the iron weapons appear to be imitations. It was inferred that the bronze weapons must have been in use when iron was introduced as a substitute. The terms, "iron age," "bronze age," "stone age," meant certain stages of civilisation, the chronological periods of which would vary in different parts of the world. It was not known when it was discovered that an admixture of tin made copper harder and more fusible, but the discovery was made independently in the New World, for some of the weapons and tools of Peru, made before there was any contact with Europeans, were of bronze of the ordinary composition. The bronze period of Britain was well illustrated by relics (representations of which were shown on the wall). There were swords, spear-heads, daggers, shields, chisels, gouges, and hatchets or axes. In the last-named weapons the gradual development of the socket from the flat blade was traced in curious detail, and the conclusion was drawn that the art of casting hatchets with a socket was introduced into this country from abroad. The bronze-using people were skilful both in founding and in the manufacture of ornaments, and a dagger had been found in Wiltshire as delicately inlaid with gold as any ornament of our own time. But man's history in this stage might be better read on the Continent than at home. In Switzerland, Italy, and the South of France the foundations had survived of the artificial islands carried on piles above the water which the men of those days built to protect themselves against their enemies or wild animals. Those men were hunters and fishermen; to some extent too they were husbandmen, and reaped their corn with sickles of bronze. They made vessels of clay, they could spin and weave both linen and woollen cloth, they possessed domesticated animals,—the dog, ox, sheep, goat, and even the horse. Besides bronze, they used flint for their weapons and other appliances. The number and varieties of instruments of that metal found in Britain seemed to carry us back to 1200 or 1400 B.C. as the beginning of the bronze period. But the flint arrow-heads and scrapers and the use of stone for battle-axes carried us back to a still earlier chapter of unwritten history. It was astonishing that men in so low a stage of civilisation should have been able to furnish themselves with so many and such perfect appliances made of stone,—hatchets and adzes of flint, with carefully ground edges, hollowed chisels, drills, hammers, knives, and saws. The presence of spindle-whorls,—the small fly-wheels by which hand-spinning is carried on,—proved that the art of spinning was known, and charred fragments of woven garments had been found in the lake dwellings of that primitive time. Wheat, barley, and millet, too, were cultivated, and the apple and pear were not only eaten, but stored up for winter consumption. It was impossible to trace the beginnings of that Neolithic period, as it had been called, although we might fix within some centuries the time at which bronze began to supersede stone as material for the most necessary utensils of life. But the circumstances under which the implements of those days were found proved that the general physical features of the country, the alternation of hill and dale and the beds of streams, were much the same as they are in the present. In the facts which he had mentioned there was little to prove the inaccuracy of the popular chronology which fixed the creation of the world about 6,000 years ago. But within the last twenty years a marvellous vista of antiquity had been opened out to us by the researches of geologists. The drifted deposits of the Test and the Itchen, and more strikingly those of the Avon, which joined the sea at Christchurch, proved that the earth was many times older than she had formerly been supposed to be. Some of those drift beds were as much as 90 ft. or 100 ft. above the existing river, and it must have required an enormous amount of time to scoop out channels of such a depth. The discovery also of the bones of the elephant, rhinoceros, hyæna, lion and reindeer, of the pouched marmot, and the Greenland lemming, pointed to climatic conditions as diverse as could well be imagined from those under which we now lived. At Southampton itself there were beds of old gravel capping the hill at the common, 150 ft. above the sea level, and yet the top of that hill must at one time have been a valley surrounded with hills. Thus the aptness of the comparison, "as old as the hills," was lost, for,—

> "The hills are shadows and they flow
> From form to form, and nothing stands,
> They melt like mists, the solid lands,
> Like clouds they shape themselves and go."

The Stone Age was divided into two periods. That which he had been describing was called the Surface Stone or Neolithic Period, while the earlier times had been designated the Paleolithic or Ancient Stone Period. The implements of the earlier era were of ruder construction, and never had their edges ground. These implements had been generally found in the river drift, whence arose the term, the "River Drift Period." Yet a great gulf of time was fixed between these two periods. There was little doubt that the gravels which now capped Hengistbury Head, Barton, and Hordle, 100 ft. above the sea, were originally deposited in the bed of a river which flowed in an easterly direction, and that the Needles at Alum Bay were the shattered and seaworn remains of an extension of the great chalk ridge of High Down, westward from Freshwater. There must have been a time when the chalk downs of Dorset and of the Isle of Wight formed one continuous ridge, and the island was not separated from England by any arm of the sea. In those days, the rivers at Poole, Christchurch, Lymington, and Exbury must have contributed to form one river flowing from east to west, which, in the course of time, had widened out until it became the Solent Sea and Spithead. Thus he had shown, though necessarily in an imperfect manner, that the history of man might be carried so far back into a dim past; and even Egyptian chronology, extending as it did over thousands of years, appeared but to cover a small link in the chain of human existence.

South Hampstead Working Men's Club. We note that the designs of Mr. Frederic A. Gosling, of 148, Hampstead-road, London, were selected in competition for the new club-house for above, which is about to be erected on the Fleet-road, Hampstead.

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DRUMLANRIG CASTLE.

IN 1842 Queen Victoria visited Dalkeith Palace, the Midlothian residence of the Duke of Buccleuch and Queensberry; in 1882 her Majesty does a like honour to Drumlanrig Castle, another of that nobleman's Scottish residences.

Drumlanrig was built by William, first Duke of Queensberry, who was as hateful to the Scottish Covenanters as he was acceptable to Charles II. It was commenced in 1679, and if reliance can be placed on the dates carved on the various portions of the fabric, occupied ten years in building, and so great was the outlay, that the duke wrote upon the bundle of accounts connected with its erection, a sort of denunciation of any of his posterity who should attempt to discover the extent of his folly,—the diction of the curse is strongly characteristic, though far from elegant:—"The deil pyke oot his een [the devil pick out his eyes] that looks herein," and only for one night did he occupy the mansion that acquired and long retained the name of "The Duke's Folly." Drumlanrig, in consequence of its resemblance to Heriot's Hospital, Edinburgh, is said by the guide-books to be work of Inigo Jones. Who was the architect of Heriot's Hospital (1628—60)? is a question that has never been answered, and Jones died in advanced age nearly thirty years before Drumlanrig was commenced.* Any one searching among the records of bygone English architects will find that Colin Campbell† designed the fabric, and any one visiting the churchyard of Durisdeer, the parish in which Drumlanrig stands, will find there a monument commemorating "James Lukup, master of works at Drumlanrig," dated 1685; he is represented in a wide-skirted coat buttoned up the sides of the skirts, and having very large cuffs, also buttoned, with a cravat hanging down his breast, and with a broad Lowland bonnet (Tam-o-Shanter), from beneath which his hair descends in full flow upon his shoulders.

Defoe, in his "Tour," writes "Drumlanrig is like a fine picture in a dirty grotto, or an equestrian statue set up in a barn. It is environed with mountains which have the wildest and most hideous aspect of any in all the south part of Scotland." Then follows a description of the building, which is better rendered by Pennant, who visited the spot fifty years afterwards:—"A square building extending 145 ft. in front, with a square tower at each corner, and three small turrets on each; over the entrance is a cupola, whose top is in the shape of a vast ducal coronet; within is a court, and at each angle a round tower, containing a staircase; everywhere is a wearisome profusion of hearts carved in stone,—the Douglas arms,—every window, from the bottom to the third story, is well secured with iron bars; the two principal doors have their grated guards, and the cruel dungeon was not forgot; so that the whole has the appearance of a magnificent state prison. . . . . The apartments are numerous. The gallery is 108 ft. long; it is ornamented with much of Gibbons's carving and some good portraits," and hereby hangs a tale.—*London Gazette*, Dec. 31, 1745. "Dumfries, Dec. 24. On Saturday last, the 21st, and the day following, the main body of the rebel army came into this place with the Pretender's son: on Monday morning he marched from hence with them, and proposed to lodge that night at Drumlanrig. They shot a tenant of the Duke of Queensbury's for running out of their way and not returning quickly enough at their call," &c.; that same night the rugged highlanders bivouacked in the great gallery, and with their broadswords nearly hacked in pieces the portrait (a royal gift) of William III., to mark their detestation of "the Glencoe affair." Sixty years ago the interior of Drumlanrig was in a sad state of disrepair, and the furniture was very meagre and dilapidated. The State chair of the early dukes and duchesses and the family portraits were the only representatives of the former pride and grandeur; but in the autumn of this present year her Majesty, travelling through Nithsdale, famed in song and story, will see the mountains, not frowning upon Drumlanrig with "wildest and most hideous aspect," but smiling in garments of purple heather and many-tinted foliage; the iron bars have long been removed from the windows and the grim gratings from the doors; "the appearance of a magnificent state prison" has changed to that of a palace; from the walls of the gallery William III. (completely restored from his encounter with the M'Donalds) and his consort Mary, and Queen Anne with her consort George Prince of Denmark, look no more on tattered tapestry and cobwebbed carvings, and the gardens that found favour in the eyes of Pennant, and reminded Defoe of Chatsworth, with their arbours and stately hedges and banks of flowers, are as pleasant and trim as when the wife of the third Duke of Queensberry, Catherine Hyde, "Kitty ever bright and young," paced the terraces listening to one who long enjoyed her patronage and friendship, telling how from a London 'prentice he became a London poet, and wrote "The Beggars' Opera."

* Mr. John Hill Burton, in his "History of Scotland," vol. vii., claims it as the work of Sir Robert Aytoun, but he gives no proof. "Mr. Walter Balcanquell, Doctor in Divinity and Master of the Savoy," by the terms of Heriot's will, furnished the plan. Arnot's "History of Edinburgh" is responsible for the Inigo Jones story.

† See *Builder*, August 12, 1882, p. 204, note.

ON CRESSET STONES.

A PAPER on this subject was read at the Royal Archæological Institute, Carlisle, by the Rev. T. Lees, M.A. Mr. Lees said:—

A cresset was a cup of earthenware or metal, fastened to the top of a pole, and containing a light, and so forming a portable lantern. When the pole was fixed in the earth, and so became a stationary light, the whole apparatus was styled a beacon. In heraldry, the beacon was the badge of Henry V., and appears on the frieze within the chantry over his tomb in Westminster Abbey. The Harleian MS. 104, says,—"The cresset with burning fire was the badge of the Admiralty"; and Mr. J. R. Planché, in explaining this assertion, writes that it was probably "founded on the fact that the badge of John Holland, Duke of Exeter, was a cresset. . . . . The cresset of the Hollands, Earls of Kent and Dukes of Exeter, was probably derived from the lordship of Wake, such lights being carried by the watch of the Middle Ages; and the motto of the Wakes of Somerset being still 'Vigila et Ora,'—'Watch and Pray'" ("Pursuivant of Arms," p. 251). The Marquis of Northampton bears for his first crest "on a mount a beacon fired."

But we are concerned at present not with the heraldic use of the cresset, but with the ecclesiastical; for cresset stones, so far as any evidence has yet appeared, were used only in churches and monasteries.

Dr. Johnson (vol. i., 4to, 1786) defines a cresset as "a great light set upon a beacon, light-house, or watch-tower;" and gives the derivation from the French "*croissette*, because beacons had crosses antiently on the top." In his anxiety to give a plausible derivation the good Doctor has made more than one mistake. The old French for a "little cross" is *croisette* with one *s*. The word *croissette*, with two *ss*, which he uses, means, "a slip of vine for planting," and is derived from *crescere*, to grow. This idea that "cresset" is connected with the word "cross" is not borne out, so far as my knowledge goes, by any example of a cresset surmounted by a cross. The cup containing the light or fire forms the top of the instrument, and has nothing above it. These fire-cups were themselves the cressets apart from the handles to which they were fixed. So we find in the "Rites of Durham" (Surt. Soc., pp. 2, 3), in the description of the St. Katherine window:—"And in the said window was there a frame of iron wherein did stand nine very fine cressets of earthen mettall filled with tallow, which every night was lighted when the day was gone, to give light to the nine altars and St. Cuthbert's Ferriture in that part, and over all the church besides, did burne unto the next morninge that the day was broken."

This application of the word "cresset" to the cup containing the light brings us to the derivation of the word. *Cresset* is the middle English word for a cup or vessel containing light fixed on the top of a pole, and comes to us through the old French *crasset*, a cresset; *croiset*, *creuset*, a cruet, pot, crucible (with which last word it seems most reasonable to ally it), from the Old Dutch *kruyse*, a cup or pot. This account of the derivation I owe to Professor Skeat's most valuable "Concise Etymological Dictionary of the English Language," and I believe it contains the true lineage of this much-disputed word.

From the cup, metal-pot, or crock, the word cresset was transferred to a cavity hollowed out in a stone, in which a light was burned. Hence the stones containing these cavities are called "Cresset Stones." There were three of these in the church and monastery of Durham, and we find them described in the "Rites"; one was in the church itself, and the two others in the dormitory. The account of the first runs thus:—"Also there is standinge on the South pillar of the Quire doore of the Lanthorne, in a corner of the same pillar, a foure squared STONN, which hath been finely wrought, in every square a large fine image, whereon did stand a foure-squared stone above that, which had twelve cressetts wrought in that stone, which was filled with tallow, and every night one of them was lighted, when the day was gone, and did burne to give light to the monkes at midnight, when they came to mattens." The description of those in the Dorter or Dormitory is as follows:—

"In either end of the same Dortor was a four [fair, *Dao*] square stone, wherein was a dozen cressets wrought in either stone, being ever filled and supplied with the cooke as they needed, to give light to the monks and novices, when they rose to their mattens at midnight, and for their other necessary uses."

From the above extracts we learn that the cressets in this case named were not earthenware or metal cups *standing on*, or *inserted in*, the stones, but the actual hollows themselves "wrought" in the stone. This, I trust, will prove to you the fitness of the word which heads this paper to describe these simple *Instrumenta Ecclesiastica*. At a meeting of the C. & W. A. A. S. held at Furness Abbey, August 7th, 1877, I read a paper on the "Probable Use of Certain Stones found in the Ruins of Calder and Furness." Two of these stones are undoubtedly cresset stones; and since the appearance of that paper I have received information regarding such stones from various quarters. Sir Henry Dryden has shown the greatest interest in the matter, and it is at his suggestion, and encouraged by his advice and kindly assistance, that I now venture to present this subject to the notice of the Institute. The following list contains particulars of all the examples yet brought to my notice. The Swedish ones I know are called "Holy Water Stones," or "vats," but this term seems misapplied.

After describing a number of examples known to him, the writer thus concluded:—

Sweden, Other Examples.—Besides the above four stones at Stockholm, there are, I find, letters published from Mr. J. Romilly Allen, which mention more Swedish examples of these interesting relics. (1) One at the church of Strio, in the diocese of Sund, of five holes, forming the cushion cap of a pillar, and somewhat like the Sewanick stone. (2) Another which was originally in the church of Nobbelop, also in Sund. "It has," says Mr. Allen, "six cups arranged in two rows, and measures, 17 in. by 13 in., being supported on a pillar of 3 ft. high."

On what ground these Swedish stones are called "vigvattens-sten," holy-water vessels, I know not. I know of no instance where a holy-water stoup is divided into different compartments. Why should it be? One large stoup or basin would serve the purpose far better than a stone block of equal dimensions, hollowed out into a series of cups. For what object these stones were used in England has, I trust, been made clear by the extracts from the Durham "Rites"; and the soot and fire stains on some of them strongly confirm the correctness of the conclusion that these stones have been simply blocks in which lights were burnt, for the convenience of the ecclesiastics at the night offices of the church, or for domestic use in their dormitories. How far their use extended to the lay-folk we have at present no means of judging.

It does not seem as if any symbolical meaning were attached to the number of cressets in each stone; for we find these numbers varying, sometimes three, sometimes five. Six seems a favourite number, and sixteen (in the Calder stone) the highest number yet known. From the "Notes from the Muniments of St. Mary Magdalen College, Oxford, from the Twelfth to the Seventeenth Century," by D. W. Macray, we learn that in 1365 "a cresset with fifteen holes and four lamps" was maintained in the Church of Chalgrove, Oxon.

The examples brought before you in this paper all belong to Mediæval times; but is it not probable that our forefathers of the Middle Ages derived their use of hollowed stones for

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light-holders from still earlier times? May it not be that the discovery of the use of cresset stones is a step (and a long one) towards the elucidation of the purposes to which those cup-marked stones were put, which have formed so long a puzzle to the pre-historic archæologist?

THE PRIMARY COLOURS.*

Of all the interesting phenomena concerning colour, resulting from recent scientific researches, probably the hypothesis that red, green, and violet are the three primary colour sensations attracts most attention, because of its apparent antagonism with the fact that red, yellow, and blue are the three primary colours of pigments.

All colours are really sensations, caused by the action of light on one of the divisions of the retina, the so-called layer of rods and cones. It has only recently been discovered, however, by Professor Max Schultz, that both the rods and the cones have each their peculiar function, and though probably both serve as elements of light, it is more especially the function of the rods, whilst the perception of colour is due, possibly exclusively, to the cones. These cones appear to be divided into three sets: one set, being stimulated by the strongest vibrations of light, produces the sensation of red; another set, acted upon by the vibrations of medium strength, produces green; and the third set, responding to the short and weak vibrations, produces the sensation of violet. Red, green, and violet are, therefore, termed primary colours. Intermediate vibrations affect two sets of cones simultaneously, and, consequently, produce compound or secondary colours. Upon the three sets of cones being excited together, in their proper proportions, the sensation of white is the consequence. If this theory be true, we may assume the existence of a colour-sense wherever we find the cones, and to mark it absent wherever they are absent. . . .

I have shown that the primary sensations of colour,—red, green, and violet,—cannot be produced by the combination of any of the other colour-rays of white light, but that conversely all the other sensations of colour are obtained by these three colours in different proportions. The same may be said of the primary colours of pigments. Red, yellow, and blue cannot be produced by the mixture of other colour pigments; but these colours are capable of producing by admixture almost all other colours. It will be at once evident that the colours of each set are different, the primary green and violet sensations being substituted by yellow and blue as primary colour pigments; and this substitution causes one to inquire whether the remaining primary of light, red, is of the same hue as the primary pigment of that name? It is here desirable to point out the very general idea the names of colours convey to the mind. When we say red, what do we mean? The term red is often applied to a colour that may be almost orange on the one side or violet on the other, green, commonly speaking, may be almost yellow or blue, violet may mean almost pink or blue. I consider that there is as much difference in the primary red of the spectrum and the primary red pigment as there is between the green light and the yellow pigment, or between the violet light and the blue pigment.

Now the primary red of light is a scarlet red; indeed, in some works the term scarlet has been applied to it. The green light is more inclined to yellow than blue, and the violet light is a decided blue violet, and has been named blue by some writers. In pigments we find that the primary colours are the reverse of this. The best red pigment for the mixture with the greatest number of other colours is a crimson red; the best yellow is more inclined to orange than blue; the best blue is of a green hue. When these pigment colours are lightened by the addition of white, there is obtained, perhaps as near as it is possible to obtain with pigments, the secondary colours of light. It would thus appear that the colours which were formerly considered primary colours, are really the secondary colours of light, and therefore, though red, yellow, and blue may be the primary colours of pigments, they are certainly not primary colour sensations caused by the vibrations of light.

* From a paper by Mr. G. H. Morton, jun., read before the Literary and Philosophical Society of Liverpool.

THE FORTH BRIDGE.

In Section G (Mechanical Science) of the British Association meeting at Southampton, Mr. B. Baker read a paper on the Forth Bridge, in which it was stated that the report of the Anthropometric Committee showed that the average stature of a new-born infant was 19·34 in., while the average height of the Guardsman sent out to Egypt was officially given at 5 ft. 10¼ in. These figures had a ratio of 1 to 3·65, and as the largest railway-bridge in this country,—the Britannia Bridge,—had a span of 465 ft., and the Forth Bridge a span of 1,700 ft., the ratio there was also 1 to 3·65. Hence to enable any one to appreciate the size of the Forth Bridge the following simple rule-of-three sum was suggested:—As a Grenadier Guardsman is to a new-born infant so is the Forth Bridge to the largest railway-bridge yet built in this country. Bridges a few feet larger in span than the Britannia had been built elsewhere, but they were baby bridges after all. It was not the physical features of the country, but the habits of the population that rendered the construction of a 1,700 ft. span expedient. The Act for constructing a bridge at Queensferry across the Forth was obtained in 1873, and the contract for the construction of Sir Thomas Bouch's great suspension-bridge in two spans was made, the preliminary works being in progress when the Tay Bridge fell. In consequence of the latter disaster, the directors of the Forth Bridge Company decided not to proceed with the works, and an Abandonment Bill was promoted in the Session of 1881. Different railway companies, interested in securing direct communication with the North of Scotland, objected to the abandonment of the enterprise, and instructed their consulting engineers, Messrs. J. Fowler, Harrison, and Barlow, to report anew on the practicability and cost of crossing the Forth by a bridge or otherwise, at Queensferry or elsewhere. A careful reinvestigation of the whole question was accordingly made, with the result that the directors were advised that it was perfectly practicable to build a bridge across the Forth which would comply with the requirements of the Board of Trade and public safety, and that the best place of crossing was Queensferry. The Abandonment Bill, which had passed the Commons, was then withdrawn, and the engineers were instructed to agree on a design. Modifications of the original suspension-bridge were then considered, and Mr. Fowler and the writer of the paper submitted a project for a bridge on the continuous-girder principle. Messrs. Harrison and Barlow, fully appreciating the advantages which would pertain to such a bridge, as compared with a more or less flexible suspension bridge, made independent investigations, and suggested several modifications, and finally the design, a model and plans of which were now before the meeting, was unanimously agreed upon by all to be recommended to the directors for adoption. The directors acted upon this recommendation, and the necessary plans were deposited, and an Act obtained this year for constructing a continuous-girder bridge across the Forth at Queensferry, having two spans of 1,700 ft., two of 675 ft., fourteen of 168 ft. and six of 50 ft., and giving a clear headway for navigation purposes of 150 ft. above high-water spring tides. For this work Mr. Fowler and the author of the paper were acting as engineers. Every one, probably, would concede that a girder-bridge would prove stiffer than a suspension-bridge, but it was not so obvious that it would be cheaper. Careful comparative estimates had, however, proved this to be so in the case of the Forth Bridge. Having explained the reasons which induced the engineers to fix on the length and width and other matters connected with the design of the bridge, the paper stated that the superstructure would be of steel. For the tension members the steel used was to have an ultimate tensile strength of not less than 30 tons, nor more than 33 tons per square inch, with an elongation of 20 per cent. in a length of 8 in. For the compression members the strength was to be from 34 tons to 37 tons, and the elongation 17 per cent. In making the tubes and other members, all plates and bars which can be bent cold were to be so treated, and where heating was essential no work was to be done upon the material after it had fallen to a blue heat. The steady pressure of hydraulic presses was to be substituted for hammering where practicable, and annealing would be required if the steel had been distressed in any way. Having given details in reference to the bridge compared with others, the paper stated that no special difficulty would arise with respect to the foundations. The total length of the great continuous-girder was 5,330 ft., or, say a mile, and of the viaduct approaches 2,754 ft., or rather over half a mile. The piers would be of rubble masonry, faced with granite, and the superstructure of iron lattice girders, with buckled-plate floor and trough-rail bearers, as in the instance of the main spans. The main girders spaced 16 ft. apart would be placed under the railway, and there would be a strong parapet and wind-screen to protect the trains. About 42,000 tons of steel would be used in the superstructure of the main spans, and 3,000 tons of wrought-iron in that of the viaduct approach. The total quantity of masonry in the piers and foundations would be about 125,000 cubic yards, and the estimated cost of the entire work upon the basis of the prices at which the original suspension-bridge was contracted for, was about 1,500,000*l.*, though, owing to the magnitude and novelty of the undertaking, the estimate must be taken as approximate only, as a contract had not yet been concluded for the works.

A NEW PAINTING FOUND AT POMPEII.

Mr. Eustace Neville Rolfe, in a letter to the *Times*, dated Naples, August 23rd, says:—"An important painting has been found at Pompeii, and was yesterday placed in the Naples Museum among the Pompeian frescoes. It represents the judgment of Solomon, and is the first picture on a sacred subject, the first fragment either of Judaism or Christianity, that has been discovered in the buried cities. The picture is 5 ft. 6 in. long, and 19 in. in height, and is surrounded by a black line about 1 in. in width. The scene is laid upon a terrace in front of a house adorned with creeping plants, and shaded with a white awning. On a dais (represented as being about 4 ft. high) sits the king, holding a sceptre, and robed in white. On each side of him sits a councillor, and behind them six soldiers under arms. The king is represented as leaning over the front of the dais towards a woman in a green robe, who kneels before him with dishevelled hair and outstretched hands. In the centre of the court is a three-legged table, like a butcher's block, upon which lies an infant, who is held in a recumbent position, in spite of his struggles, by a woman wearing a turban. A soldier in armour, and wearing a helmet with a long red plume, holds the legs of the infant, and is about to cleave it in two with his falchion. A group of spectators completes the picture, which contains in all nineteen figures. The drawing is poor, but the colours are particularly bright, and the preservation is excellent. As a work of art, it is below the average Pompeian standard, but it is full of spirit, and drawn with great freedom. The bodies of the figures are dwarfed, and their heads (out of all proportion) large, which gives colour to the assertion that it was intended for a caricature directed against the Jews and their religion. This may be so, but my own impression is that the artist was anxious to develop the facial expression, and, to do this, exaggerated the heads. There is nothing of caricature about it in other respects."

AN ANCIENT BUILDING CONTRACT.

At a recent meeting of the Berlin Archæological Society, a description was given by Herr Curtius of a stone tablet which had been discovered in April at the Piræus, containing details of the contract entered into for building a house intended for the reception of naval stores, &c. The details show that at the early period in question the Greeks were careful in such matters. Provision seems to have been specially made for openings in the walls for purposes of ventilation.

The Traffic of Regent-street and Pall Mall is suspended in consequence of the streets being paved by the Asphaltic Wood Pavement Company, Limited. The company has also been entrusted by the Corporation of Leeds with the contract for the repaving of St. Paul's-street and Aire-street in that town.

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THE LATE MR. EDMUND WALKER.

I HAVE looked in vain for an obituary notice in your journal of the late Mr. Edmund Walker, of Maitland Park, N.W., an artist well known to architects, many of whom will be sorry to learn he passed away on July 9th, aged 68. To his skill in water-colour drawings not a few of the leading architects of present and past days have been indebted for his highly-artistic rendering of their perspective outlines; and they could always rely upon him for rapidity as well as excellence. His professional career is full of historical interest. Some forty years ago he had a lucrative practice in miniatures on ivory, and was well supported. The Daguerrotype process, followed by photography, destroyed that connexion. He then visited many of the country seats in England, Chatsworth amongst the rest, and made local and finished drawings of the mansions, whose owners readily purchased them. Prior to 1851 he became connected with the then firm of Day & Son, and executed all those noted large interiors of the Great Exhibition of that year, first in water-colours and afterwards in chromo-lithography. On his judgment and taste the late Sir Joseph Paxton, Sir Digby Wyatt, and Owen Jones largely relied for the effective placing of the principal objects in that exhibition; and the late Captain Fowke engaged him for similar drawings for the 1862 Exhibition; but those were not published.

He was commissioned to paint the Opening Ceremony of the Horticultural Gardens, but as the Queen was prevented being present the picture passed into the hands of the Baroness Burdett-Coutts. The first water-colour drawings of the Thames Embankment exhibited by Mr. Bazalgette in the Royal Academy, which all who then saw them will doubtless well remember, were by Mr. Walker, and it was not uncommon in those days for his work to be seen in a dozen or more drawings in a single year in the Architectural Room of the Academy Exhibition. His artistic powers were versatile,—buildings, landscapes, figures, battle-scenes, and any other subjects were handled in a masterly way. All the sketches made by Mr. Simpson during the Crimean War were rendered by Walker as finished productions in chromo-lithography, and afterwards those of the Indian Mutiny, published by Messrs. Day & Son. In the misfortunes of that firm he largely participated, a blow from which he never fully recovered. His gentlemanly bearing, and refined feeling, and honourable dealings, added to his ready apprehension of what was wanted, and his punctuality in keeping engagements, attached many architects to him very closely, and the profession has sustained a loss.

H. J. PAULL.

OBITUARY.

Mr. James Inman.—Died, on Friday, the 25th ult., in his 72nd year, Mr. James Inman, long in the employ of Messrs. Crace, of Wigmore-street, and for the greater part of the term their trusted and respected foreman. Mr. Inman was Messrs. Crace's foreman of painters, and had remained continuously in their employ for fifty years and some few weeks at the time of his death, which occurred suddenly on his return home from his day's work. It was latterly his boast that he had never, during the whole of that time, been five minutes late in coming to work in the morning; and this was literally true at the time of his death, for he was at his post at six o'clock on the morning of his death, though contrary to the advice of his employers, he having shown signs of ailing the previous day. It is, perhaps, needless to say that he was a most careful and temperate man, and had made his employers' interests his own chief interest. They lose a valued and trusty old friend.

Sale of Land at Clacton-on-Sea.—On Monday last, by direction of the Clacton-on-Sea and General Land, Building, and Investment Company, Limited, Messrs. Harman & Matthews, auctioneers, held their second sale this season of freehold building land at Clacton-on-Sea. A large number of small plots, realising in the aggregate about 4,500*l.*, were sold, and a large plot, having a frontage of 400 ft. to Harold-road, was sold for 600*l.*

THE EXPLORATIONS OF ROMAN VILLA AT BRADING.

LADY OGLANDER (having acquired that portion which belonged to Mrs. Munns) has granted a lease of the whole site of the Roman villa at Morton to Messrs. John E. Price and F. G. Hilton Price, to enable them to continue the explorations.

As these gentlemen, who formerly acted as executive for the committee that was formed, have now full legal right to carry on the work themselves, the functions of the committee, it is thought, may cease.

It is proposed, therefore, to hold a final meeting of the committee on this Thursday, the 31st of August, at one o'clock, on the site of the Villa, to report the work done and to dissolve. The arrangement certainly does not commend itself to us. It may be all right, but the statement reads oddly.

THE "NOVELTY" THEATRE.

THIS theatre, as we stated in our last, is approaching completion, and will probably be opened some time in October. The theatre occupies a site on the north side of Great Queen-street, Lincoln's Inn-fields, and has a long frontage to Parker-street. The architect is Mr. Thomas Verity, whose plans have been well carried out by Messrs. Kirk & Randall, the well-known contractors, whose representative on the works is Mr. E. Smith, Mr. H. M. Taylor being the clerk of works. The theatre will accommodate in all from 1,400 to 1,500 persons, thus distributed:—In the pit, 500; in the stalls, 90; dress-circle tier and private boxes on same tier, 150; upper-circle tier and private boxes, 150; gallery, 600. The principal portions of the theatre are approached by a handsome and roomy vestibule, entered from Great Queen-street. The theatre itself is placed at right angles to this vestibule, or, in other words, parallel with Great Queen-street, the stage being at the west end. The private boxes will be provided with movable partitions, so as to allow of two or three compartments being thrown into one when necessary. The whole of the construction of the box and gallery tiers is of iron and concrete, by Messrs. Dennett & Ingle, who have also supplied the iron girder carrying the wall above the proscenium opening, and the girders which carry the flank walls over the private boxes. Behind these flank walls, and over the second tier of boxes, are located dressing-rooms and other apartments connected with the stage department of the theatre; these, however, are quite isolated by fireproof construction from the auditorium. By means of a mezzanine, two stories of dressing-rooms are obtained in the height of the gallery tier at each side of the theatre, the gallery only occupying the central portion of the tier, and not extending over the private boxes. Besides the dressing-rooms already named, there is, at the back of the stage on the side next Parker-street, a tier of six other dressing-rooms. The depth of the stage from back to front is about 27 ft. The width of proscenium opening is 26 ft. 6 in. The whole of the decorations will be in fibrous plaster by Messrs. George Jackson & Sons, of Rathbone-place. The sanitary fittings throughout will be supplied and fitted by Messrs. John Bolding & Sons. The sun-burners in theatre and *foyer* are by Messrs. Strode & Co.; the revolving steel shutters at the entrance to vestibule are by Messrs. Archibald Smith & Stevens, of Leicester-square; and the effective ornamental ironwork in handrail to principal staircase and elsewhere is by Messrs. W. T. Allen & Co. The excavations for the building have been carried down 22 ft. into the blue clay, and this has involved the underpinning of the somewhat dilapidated properties by which the theatre is almost completely hemmed in except on the Parker-street side. The vestibule, which forms the principal entrance from Great Queen-street, is 56 ft. long by 26 ft. wide. This vestibule is on a level with, and affords direct access to, the dress-circle tier, the private boxes being reached by descending a few steps. An extra exit for this tier is provided, opening into Parker-street. The upper circle is reached from the vestibule either by means of the grand staircase leading up to the *foyer*, or by the upper-circle staircase on the opposite side of the vestibule,—the latter staircase being continued up to the gallery with the view of serving as a supplementary exit from that portion of the house, should it ever be necessary. There is also an extra exit from the upper-circle tier into Parker-street. The entrance to the pit is from Great Queen-street, by a passage on the east side of the vestibule, leading to a flight of steps going down to the pit. There is another exit from the pit into Parker-street. The gallery entrance is from Parker-street. For every part of the house there is thus provided means of exit in addition to those afforded by the entrances. There are no tortuous passages, no winding stairs, and all the staircases are of stone. On each tier there will be provided a refreshment saloon and separate retiring-rooms for ladies and gentlemen. The *foyer* is a handsome room over the vestibule on the upper-circle level, and looking into Great Queen-street. It will measure 33 ft. by 26 ft., and be 20 ft. high to the ceiling. This will, it is stated, be made into a very attractive picture-gallery. The amount of Messrs. Kirk & Randall's contract is between 10,000*l.* and and 11,000*l.*, but the total cost will be not far short of 15,000*l.*

EXTENSIVE ROMAN REMAINS AT BATH.

WE have already incidentally alluded to the excavations which have been for some time in progress on the site of the Roman baths, and we are indebted to *Keene's Bath Journal* for some details concerning a bath which is now being excavated. The *Journal* says,—

In the centre of a large rectangular area is sunk a bath, nearly 80 ft. long and 38 ft. wide, its sides formed by six continuous steps. The bath is 4 ft. 9 in. deep. On the north and south sides,—the lengthway of the bath,—are massive pedestals with moulded base, and upon them were built the piers and columns that supported the roof. These pedestals are about 13 ft. apart, and are of a particularly massive character. Midway on the north side is a small reclining figure, which, much to the regret of antiquaries, has been damaged very considerably. In the centre of the figure is an aperture, which probably served as a channel for a pipe which conveyed the water to supply the bath. The steps leading from the figure are "notched," and a small pier of masonry juts out into the bath, and this, it is believed, formed a base upon which, in all probability, rested a trough or basin to receive the water flowing from the pipe, and thence was allowed to overflow into the bath. The whole of the bottom of the bath is covered with lead, which remains as originally laid on a bed of concrete, and the thorough and complete manner in which the bath was erected may be inferred from the fact that a layer of freestone, about 1 ft. thick, served as a foundation to the whole. At the four corners of the bath are apses (semicircular recesses), and midway on the north and south sides are square recesses; each angle is finished with a pedestal having a moulded base. A portion of the bath was covered in with a light but strong roof of hollow bricks of Roman manufacture. A large number of these bricks have been found among the *débris*, but some doubt has been expressed as to whether they were used for the purpose of a roof. These hollow bricks, it has hitherto been supposed, were used only in connexion with the conveying of heat from the hypocaust fires, but in the course of the excavations masses of these tiles were met with, which, on careful investigation, and examination, suggested to Mr. Mann (in whose hands the work had been placed) the idea that they were portions of an arched roof.

The stone used throughout is the freestone so plentifully found in the quarries aronnd Bath. The lead in all probability came from the Mendip hills. . . . .

Amongst other interesting objects discovered during the excavations is a rude representation of Minerva, which was found nearly at the bottom of the bath. The face and helmet are damaged and the spear-head broken. The owl resting on the shield is also somewhat damaged, but still recognisable, and the head of Medusa as a breast-plate stands out very clear. In connexion with this it may be mentioned that in 1790, under the foundations of the present Pump-room remains of a temple to Minerva were found.

The Antiquities Committee, who have proceeded with the work of uncovering these remains, are to be congratulated upon the

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success which has so far crowned their labours. Much, no doubt, remains to be done, and money is needed to enable them to complete the work. We cannot, however, conceive that the learned world will withhold its aid.

Mr. Jerom Murch is the chairman of the Antiquities Committee, and (under the supervision of Mr. Davis, the surveyor of works to the Corporation) the work is being carried out in a satisfactory manner by Mr. R. Mann, the contractor.

COMPETITIONS.

Sculptural Panels for St. George's Hall, Liverpool.—The committee appointed to consider the designs received in the above competition have decided to recommend the Council to award the premiums as follows:—No. 1, 200*l.*, Mr. Thomas Sterling Lee, Merton Villa Studio, 280A, King's-road, Chelsea, London; No. 2, 100*l.*, Mr. J. Milo Griffith, 243, Stanhope-street, Regent's Park, London; No. 3, 50*l.*, Mr. W. S. Frith, 336, Clapham-road, London. The designs which have received the first premium represent Wisdom, Justice, Temperance, Orpheus, Tragedy, Comedy, and Astronomy. The author of these designs remarks that the parts of the building designed for the introduction of the sculpture naturally resolve themselves into four grand divisions or series, and may be grouped thus:—First series: The six panels on the left of the entrance to be devoted to the attributes and results of Justice. Second series: The six panels on the right of the entrance to be devoted to the causes and results of National Prosperity. Third series: The eleven panels at the north or Concert-room end, nine panels of which are on the circular portion, to be devoted to subjects symbolised by the Nine Muses, and the two on the return flanks to be devoted to Orpheus, as symbolical of Singing, and to Tubal Cain, as symbolical of harmony. Fourth series: The remaining five panels at the corners of the building to be devoted to subjects emblematic of the Arts.

The Ebbw Vale Market Company (Limited), having offered the sum of 20*l.* for the best design for a new market-house, to be built near the London and North-Western Station, Ebbw Vale, plans from various architects were submitted, and those prepared by Mr. E. A. Lansdowne, of Newport, Mon., finally accepted. The stalls for poultry, butter, basket-fruit, vegetables, clothes, and boots and shoes, will be made to travel on rails to the end of the hall, where they will form supports of the large platform when the building is used for public entertainments, concerts, &c. The butchers' stalls will be open. The main walls will be of blue pennant stone, with Bath stone dressings, and the roofs formed of angle and bar iron. The total cost, when finished, will be about 2,000*l.*

GLASGOW MUNICIPAL OFFICES COMPETITION.

SIR,—In making a cube estimate of my design, to which the first premium was awarded in the first competition, I valued the whole at 1s. a cubic foot, taking the height in the usual way, from the bottom of the foundations up to half the height of the roof, the result being 150,432*l.* The towers were included in that valuation at the same rate.

Mr. Barry, in his report, said that he considered the estimate insufficient, and that it would require 220,000*l.*, without reckoning the sculpture.

The author of the design now adopted, estimated the basement story up to the ground-floor line at 9d. a cubic foot; thence, to half the height of the roof at 1s.; and the towers above that level at 1s. 6d.

Mr. Barry considers this estimate sufficient.

I have not seen Mr. Young's design, but from the published descriptions it does not appear to be any less elaborate than mine.

If that is the case, Mr. Barry has evidently modified his views of the cost of building in Glasgow to a very considerable extent.

G. CORSON.

TAR ROOFS.

THE German Government has on several occasions pointed out to farmers and others interested in agriculture, that too great an expenditure of capital on buildings is a mistake. With a view of illustrating the application of this principle of economy to roofing, the *Cologne Gazette* points out that the system of using tar for roofing purposes is at the same time economical and suitable for agricultural buildings, and what is said may serve as an answer to a recent inquiry in our own pages. The framework of the roof can be of relatively slight construction on account of the nature of the covering it is intended to support, and the perpendicular height of the roof can be one-eighth to one-tenth of the entire depth of the building. The distance of the rafters is arranged according to the width of the covering material, the scale being that from the middle of one rafter to the middle of another. The distance should be 2¾ in. less than the width of tar roofing sheets.

Immediately above the rafters come boards, and upon these (exactly in the centre of the separate rafters) are placed strong laths, about 2 in. wide and 1¼ in. thick, the upper edges being taken off. The roofing sheets are now placed so as to cover the spaces between the laths, and are nailed. Over the laths are placed strips of paper, 5 in. to 6 in. wide, fastened with nails at intervals of 2¾ in.

In order to make the sheets lie smoothly upon the boarding, it is suggested, in case they are too dry, to soften them by immersion in water. It is recommended that the workmen should not wear heavy-nailed boots, and also that if the rain comes on, the roof should not be walked upon immediately after. When the entire surface of the roof is covered with sheets, the strips of paper (or caps) already named, as well as the joints, are painted over with a hot mixture of coal tar and pulverised lime. Pure dry sand is at once sprinkled over this coating, and particular care must be taken that all the nail-heads are well covered. When the paint is dry the whole surface of the roof is once more coated with the same mixture, and is sanded.

The object of this careful method of overlaying the roof with several coatings of specially prepared solutions is to preserve in the tar those oleaginous and fatty properties which it soon loses if exposed to the air, and the retention of which is an indispensable condition of its resistance to water. Clay and sand do not afford sufficient protection, as they are removed by violent winds.

Reference is made to various systems of coating the tar roof with protective substances, for the purpose indicated. One of the most successful methods consists of a mixture of cow-dung and thin white-lime, which is spread over the entire surface of the roof. If such a coating is not applied, the tar paint must during the first four years, be annually renewed, which enhances the cost of the roof. If the last-named protective composition is used, and renewed every two years, the coating of tar and lime can be dispensed with. Particular mention is, however, made of a coating of tar, mixed with Portland cement, the tar being well heated and used in the proportion of 111 lb. to 200 lb. of cement. The mixture should be kept well stirred during preparation, and should be applied as soon as made. This particular method has been tried in many cases in Germany, and according to the journal quoted from, its satisfactory results have caused its adoption upon a scale of progressive importance.

ST. JAMES'S RESIDENTIAL CHAMBERS.

A VERY extensive block of buildings, called St. James's Residential Chambers, covering an area of upwards of 13,000 superficial feet, is at present in course of erection at the West End. The premises are situated between King-street and Jermyn-street, and have a frontage to Duke-street 110 ft. in length, and one to Ryder-street 119 ft. long. They are faced with Prudham stone, from the quarries near Newcastle-on-Tyne. The two elevations, which are strictly uniform in their architectural character, have three lofty stories above the ground-floor, the third story being surmounted by a bold and richly-carved cornice. The height of the elevation to the top of this cornice is 50 ft. Above rises a high-pitched roof, in which there are two additional floors, the upper floor having pediment dormers. The entire height of the building to the ridge of the roof is 75 ft. The ground-floor of both frontages will consist of shops, each shop having handsome elliptical-headed windows, with rusticated and fluted pilasters between each shop. At the west end of the Ryder-street frontage there is an arched entrance, 10 ft. in width, to the Turkish Baths in Jermyn-street, the proprietor having a private right of way from Ryder-street to the baths. Above the shops there is an ornamental cornice. The first and second floors have each a range of eight arched and pediment bay-windows, the columns at each angle of the bays being ornamentally carved and panelled. The third-floor windows are three-light. The entrances to the chambers will be in both streets, leading to spacious and decorated staircases.

The interior of the buildings is well arranged for their intended purpose. The first and second floors will consist of suites of two rooms each, viz., a living and a bed room, each suite having separate bath-room and other conveniences. There will be ten of these suites on each floor. The rooms are all of uniform size,—20 ft. 6 in. square. The third floor will consist of twenty single rooms, each room having a separate bath, as in the suites on the first and second floor. The fourth floor in the roof will be similarly arranged as the third floor. The attic floor will be reserved for the servants. The kitchen and culinary department will be in the basement, from which there will be a lift to the top of the building. The whole of the floors, with the exception of the attic, are fireproof.

Messrs. Jameson & Wallis, of Great Russell-street, Bloomsbury, are the architects, and Messrs. W. & C. Macgregor, of London and Edinburgh, the contractors. Mr. Lawson is clerk of the works.

GREAT TEY CHURCH, ESSEX.

ONE of the most interesting specimens of church architecture visited during the late excursion of the Essex Archæological Society was the Church of Great Tey, dedicated to St. Barnabas. Mr. G. Golding draws attention to its miserable condition.

The fine Norman work of the eleventh century consists chiefly of the square central tower (all now left), itself well worthy of a visit. It is of pure Norman architecture, having been a cruciform structure, with nave, aisles, two transepts, and chancel; but the state of the interior of the sacred edifice presents a series of Vandalisms happily now seldom met with. The pews are placed facing west in the chancel, which is at the east end, the nave having been suffered to fall into total decay and ruin, and is totally gone. This of a church stated in the Clergy List to be, with vicarage and sinecure attached, of the now value of above 1,050*l.* yearly.

THE CHURCH IN SCOTLAND.

SIR,—In your issue of July 1st I observe that you enter among the items of "Dissenting Church Building News" a notice of the new Episcopalian church at Keith, Scotland. Now, as a Scottish "Episcopalian" Churchman I protest against our churches being described as "Dissenting." The term is as wrong in fact as it is in principle. The Episcopal Church of Scotland is not in any sense a dissenting church. Politically and historically it is the oldest religious body in Scotland, and was disestablished in 1698 in favour of Presbyterianism. Therefore whatever it dissents from, it cannot be said to dissent from the Establishment. To term Churchmen Dissenters in Scotland would but raise a smile on the face of every Presbyterian who heard it. The term "dissenter" is, however, a purely English one, and is practically unknown in Scotland. In your columns it is clearly used as meaning a Christian community outside the Church of England. Hence the Episcopal Church of Scotland being in full communion with the Anglican Church is manifestly not a dissenter from it. It has already been shown as being no dissenter from the Scottish Presbyterian Church. Therefore in no sense is it a dissenting church.

I would, however, suggest that your division of news of ecclesiastical building into "Church" and "Dissenting Church" is, for a secular journal, an infelicitous one. Rather I would prefer to see all Christian denominations classed in one column, such as Church of England, Church of Ireland, Episcopal Church of Scotland, Established Church of Scotland, Wesleyans, Independents, Roman Catholics, &c.

India, July 30. SCOTO-CATHOLIC.

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BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

3,956. J. H. Johnson, London. Production of artificial stone or marble. (Com. by the Certaldo Marble Company, Paris.) Aug. 18, 1882.

3,965. S. Cornforth, Birmingham. Apparatus for punching nail holes in rooling slates. Aug. 18, 1882.

3,969. J. Chaffin, Charlcombe. Glazing greenhouses, &c. Aug. 19, 1882.

3,990. E. Tomlinson, London. Apparatus to facilitate the lighting of fires, &c. Aug. 19, 1882.

4,000. A. Keim, Munich. Process for rendering wall-paintings weatherproof. Aug. 21, 1882.

4,002. R. W. Crabtree, Leeds. Kitchen ranges. Aug. 21, 1882.

4,031. W. R. Lake, London. Heating apparatus. (Com. by M. J. Walsh, New York, U.S.A.) Aug. 22, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named :—

August 22, 1882.

1,828. A. Smith, Huddersfield. Securing and holding sliding window-sashes in a closed or open position. April 17, 1882.

2,017. H. J. Haddan, London. Manufacture of mosaics. (Com. by G. Stanley, Massachusetts, U.S.A.) April 28, 1882.

3,944. G. J. Dickenson, Albany, U.S.A. Sash-fasteners, Aug. 17, 1882.

August 25, 1882.

1,916. T. A. Riggs, Aldeburg. Combination of substances for bricks, blocks, &c. April 22, 1882.

1,959. J. Noad, East Ham, and H. Salomon, London. Manufacture of ornamental surfaces for building, &c. April 25, 1882.

1,974. J. Henson, Derby. Barns and shelters with rising and falling roofs. April 26, 1882.

1,979. J. Beresford, Birmingham. Urinals. April 26, 1882.

ABRIDGMENTS OF SPECIFICATIONS.

Published during the Week ending August 26, 1882.

237. M. Delmard, Plumstead. Window-sash fastener. Jan. 17, 1882. Price 2d.

An eccentric cam is mount ted on the lower sash, which, on being turned, engages a hooked stud on the upper sash. (*Pro. Pro.*)

258. R. G. Greig, London. Stoves for heating and ventilating. (Com. by the Detroit Stove Works Company, Detroit, U.S.A.) Jan. 18, 1882. Price 1s.

The improvements are in a number of details which are not capable of being summarised. The principal one is that a separate shell surrounds the magazine section through which air circulates and is warmed.

261. E. L. Voice, London. Decoration of wall surfaces and ceilings. Jan. 19, 1882. Price 2d.

The decoration is effected by laying on the finishing coat of plaster with a composition of cement mixed with colouring matter and a small proportion of sand. The ornaments are then cut out of the plaster, and filled in with suitable colour. After drying the surface may then be painted. (*Pro. Pro.*)

265. J. Westley, Chorley. Rollers and fittings for blinds. Jan. 19, 1882. Price 2d.

A groove is formed in the roller, and a strip made to fit the groove. When the end of the blind is placed in the groove the strip is forced in and secures the blind. (*Pro. Pro.*)

276. T. Rowan, London. Ventilating water-closets, urinals, drains, &c. Jan. 19, 1882. Price 6d.

This is an improvement on Patents Nos. 5,303 of 1880, 162 of 1881, and 505 of 1881, in employing jets of water for producing an induced current for carrying off the foul air and gases.

295. S. H. Terry, London. Water-closets and urinals. Jan. 20, 1882. Price 6d.

Instead of using a hand-lever for actuating the valves, &c., a pedal lever is employed.

306. G. Smith, Bradford. Application of earthenware pipes for conveyance of gas, water, sewage, &c. Jan. 21, 1882. Price 2d.

These are embedded in cement or concrete to enable them to withstand the pressure and prevent leakage. (*Pro. Pro.*)

317. J. Holroyd, Leeds. Sanitary trough closets. Jan. 21, 1882. Price 6d.

This is an improvement on Patent No. 2,915 of 1879, in making the outlet above the bottom of the trough to ensure a continuous supply of water therein. The bottom inclines upwards to lead the material to the outlet. The trough is flushed from the other end.

351. J. Holroyd, Leeds. Tanks for flushing and ventilating drains. Jan. 24, 1882. Price 6d.

These are constructed of earthenware pipes, at the bottom of which is the outlet-valve, which is opened periodically. A man-hole on the surface of the ground, covered with a grating, is provided for ventilation, &c.

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street.

CONVICTION FOR BUILDING ON AN ADVANCED LINE OF FRONTAGE.

AT the Edmonton Petty Sessions on Monday week, and by adjournment on Monday last, was heard, before Mr. M. Latham and other Justices, a summons, issued at the instance of the Tottenham Local Board of Health, against Herbert Oxenham, of Berwyn House, Finsbury-road, Wood Green, "For that he unlawfully, and without the consent in writing of the Urban Authority of the Tottenham District, did bring forward a certain house forming part of a street there, called Bounds-green, and beyond the front wall of the house on one of the sides of such house, and did continue such offence for three days after receiving a written notice in that behalf from the said Urban Authority to remove the same."

Mr. Crowne, clerk to the Tottenham Local Board, said the defendant was summoned for a violation of the 156th section of the Public Health Act, and that he was liable to a penalty of 40s. a day after a written notice had been given to him that he was committing the offence. The Local Board had not given him the consent to bring out his buildings, and in the month of April last he had a distinct notice that he could not erect his buildings until the line of frontage had been decided upon by the Board.

Mr. De Pape, surveyor to the Local Board, said he had inspected the site on which the defendant was erecting some houses, and those houses next to it, which he knew were erected over six years ago. The frontage of those built by the defendant was 10 ft. 3 in. beyond that of the others. No application had been made for permission to bring out the fronts, nor would the witness have advised the Board to consent to such an application.

Mr. Woodgate, barrister, who appeared for the defendant, subjected the witness to a long examination on technical points, the principal being the meaning of the term, "line of frontage."

Mr. Wilson, inspector of buildings to the Local Board, proved having served the summons on the defendant on the 5th ult. He saw the defendant, and expressed his dissatisfaction with the footings and brickwork of the buildings, and the defendant removed them. It was not his duty to define the line of frontage, and he had no conversation with the defendant on that subject.

The Bench determined, before giving their decision, to view the site and buildings, which they accordingly did.

Mr. Latham, on the matter coming before the Bench again, said they had given a great deal of attention to the case, and had been to view the place, and in the opinion of a majority of the justices, there must be a penalty of 40s. for the original offence, but not a continuing penalty. It was a decision in which he himself did not concur, but a majority of the Court were of the opinion he had stated. He believed the technicality of the Act was not met by the facts of the case.

The defendant said he discontinued the building on receiving the notice.

Mr. Latham said that was the reason they did not inflict a continuing penalty.

An appeal was then asked on the part of the defendant, and at once granted by the Bench.

WIND PRESSURE.

IN the Mechanical Science Section of the British Association meeting at Southampton, the first business on Tuesday last was the reception of the report of the Committee on Wind Pressure :—

Stated that the total pressure on small plane surfaces due to actual winds in high and exposed positions had to a great extent been ascertained with sufficient accuracy for engineering purposes. It must be assumed, for the present at least, that, for engineering purposes, pressures of 80 lb. or even 90 lb. per square foot on surfaces had been correctly recorded in extremely exposed positions, such as the Bidstone Observatory; while pressures approaching the limit prescribed by the Board of Trade, 56 lb. per square foot, might possibly act on engineering structures in exposed positions. As in the design of marine works, the depth of water and the length of fetch enabled some estimate to be made of the strength of structure required to withstand the heaviest seas to which they might be exposed, so a careful comparison of the wind pressure observed during the height of a gale at various stations where anemometers existed would enable some estimate of the relative exposure of similar places to be made. Exceptionally high gusts of short duration should be excluded from the comparison as being probably limited in area.

In the course of the discussion which followed, Mr. Barlow expressed the opinion that any work made strong enough to withstand the regulation pressure of the Board of Trade would not be in danger from any wind which would ever blow in this country.

The Committee was re-appointed.

RAILWAY CLOCKS.

SIR,—Having read Mr. Morgan's letter in last week's *Builder* about the regulating of railway clocks, I would ask you to allow me a small space in your paper for a few words on the subject. My excuse for taking the liberty is that I have had many years' experience both in making railway watches and clocks, and in attending to the clocks on the lines.

I quite agree with Mr. Morgan's remarks that railway clocks ought to show, as near as possible, the correct time, and that the present state of railway clocks, and, I may say, of most of our public clocks, is far from satisfactory; but there are difficulties which non-watchmakers are not likely to see. All railway stations shake very much when a train passes or comes to a sudden standstill, and the pendulum is thereby disturbed each time. The pallets of station clocks wear in a remarkable way, and differently from other clocks, showing distinctly the trembling of the pendulum when the trains pass. The temperature, also, is very variable, and many of the stations,—in fact most of them,—are very damp. Some of the above-mentioned difficulties could be overcome to a great extent, but at present they are disregarded altogether. Clocks are fixed in places where it is impossible for any clock to go correctly. Railway clocks may be seen in all conceivable places, some sticking out from the wall like a lamp, others suspended like a trapeze; some are made to carry several sets of hands, and constructed so that it is utterly impossible for the different hands to show the same time. As far as my experience goes, it is a question of expense; the price paid at present for railway clocks and for keeping them in order is much too low to obtain correct timekeeping.

CHRISTIAN LANGE.

OLD BUILDINGS, YARMOUTH.

SIR,—At a recent special meeting of the Great Yarmouth Lands Committee it was carried "That the old Tolhouse hall and the entire contiguous property be sold, the fixtures, materials, and ground in separate lots; the total amount thus realised to be applied to the funds for defraying the costs of the erection of the new municipal buildings."

Unless some steps are taken at once, or a strong protest raised, the above quaint and interesting old building must rapidly disappear, as in about three weeks or a month the sale will take place.

Your readers may possibly remember the building in Middlegate-street, with its external staircase inclosed with a wooden balustrade, its canopied and blue-coloured figure of justice holding the sword and scales, and surrounded by the arms of the town; and its high-pitched roof, with gable windows. Herein was the Hall of Justice,—since the time of King John,—and it has been the scene of many trials of pirates and prisoners.

Underneath "the great chamber at the Tolhouse hall," as Manship writes (and it is but a small place after all), are many dungeons and the gaoler's house, in which felons and debtors were, until lately, confined. At the top of the staircase from the street, and also in the prætorium (as it is described), are two beautiful Early English doors, the latter having a double row of dog-tooth mouldings, and being in a perfect state of preservation, and which probably formed a portion of the monastery of Grey Friars, who settled on adjacent property in 1270.

The building is now untenanted, owing to the courts being removed to the new town-hall, but it is to be hoped that such an historical building may not fall into the hands of the despoiler, but may eventually be retained as a museum for the display of much that it is the pride and good fortune of Yarmouth to possess.

E. PRESTON WILLINS.

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KING'S CROSS TO FARRINGDON-STREET.

WORKMEN'S TRAINS.

SIR,—In the body of an average working man, what proportion does the width across the shoulders bear to the thickness from front to back? After many experiments, I find it to be as 8 is to 5. The experiments were conducted in this way. Having, some little time back, to carry out a job in the City, I left my lodgings near Russell-square to catch an early workmen's train at King's-cross Station of the Underground Railway. There are five of these trains between 5·50 and 6·50 a.m. and the first two are almost invariably found to have every seat occupied on arrival at King's-cross, where very few get out, and from 100 to 200 are waiting to get in to be conveyed Citywards. The compartments accommodate five persons on each seat, and as it is essential that the workmen should be at their work, and not standing catching cold on the platform, they crowd into the standing-room between the knees of the sitters, to the extent I have indicated,—five on each seat, and eight standing edgeways between them.

Of course these experiments,—which, doubtless, are being continued,—are very unpleasant for those engaged in them, and are, I believe, contrary to law; and I have sometimes wondered whether the Board of Trade or other proper authority would interfere if it should come to their knowledge.

In the labour list you published on the 12th ult., the rate of wages of plumbers in Birmingham is given as 7d. per hour; it should be 8½d. per hour in town, and 9d. per hour on country jobs, with lodging and travelling money.*

E. GRIMES.

WATERPROOF CEMENT, &c.

SIR,—Before touching the above subject, I wish to ask if it is known where or how a good yellow can be procured that will stand the chemical action of Portland cement when it is incorporated in the body of that material? Also, a black and a yellow to withstand the caustic properties of silicate of soda and potash, separately or combined with the various compounds, cements, and limes? If any of your readers can supply the required information, it would be of good service. In surface decoration it is simple, which is no test proof for the above.

I have long and often used copperas mixed and gauged with Portland cement, oxide of zinc, and magnesite, likewise in other compounds, cements, and limes, and I have found it equal in every particular to their more natural chlorides, and in some respects far superior both with and without the silicates; and when well beaten up or ground when gauged I have never experienced in it a tendency to crack, even though the cement may be too fresh (which is overcome at all times with a small percentage of lime putty). The lias lime, of course, is the best; and by reversing this we add a small percentage of Portland cement to any of the lime, say, from 1 to 10 per cent., either of which will greatly improve the limes: the most suitable for bricklaying or pointing, and for plastering,—more so where exposed to the damp of the weather.

To obtain a yellow, I have in the same manner used picric acid with and without ochre, and this I have immersed in strong solutions of copperas; also a solution of picric acid, and the two combined, but the nearest approach to a yellow gained even then has been a dull fawn colour.

Ultramarine blue will stand, and with or without it, by choosing a blue Portland cement, submitted to a bath of the copperas and picric acid, a deep bronze-like green of a metallic cast is produced; a corresponding effect, but of a more varied kind, is obtained with other colours, and where a variety of coloured parts are brought in juxtaposition it has a very remarkable and beautiful effect, some of the lighter colours becoming much changed. These processes, employed with that I have shown and explained to you at various times, if properly developed, would most certainly and fully realise the long-sought quest of the Social Science Congress and other science assemblies, for the artistic, architectural, and horticultural improvements of our streets, town and country houses, from the mansion to the cottage. EDWIN ROBBINS.

P.S.—Further to improve the colour, and render it still more durable and waterproof, I saturate or coat the same with paraffin and petroleum, as represented by Herr C. Puscher, but in addition I use tallow, and with paraffin and soap dissolved in hydro-carbon, &c., which gives a splendid polish. Yet to further firm, heighten, and protect the same, I coat it with silicate of soda, which I first rub with a cloth slightly damped with a chloride, after which no water will penetrate or stain. This will give a most perfect face to plaster or Keene's cement, as proved in the Marezzo marble by me at various works, the receipt for which I sold for 2*l.* in 1876.

* We gave our authority.

PROVINCIAL NEWS.

Bideford.—The new bridge buildings recently erected at the western extremity of Bideford Longbridge, overlooking the river, and also facing the Guildhall, are about to be formally opened. The records of the old buildings formerly occupying the site, and which comprised the Bridge Hall, Grammar School, and Free School, are of some interest. The new buildings have been erected at a cost of about 4,000*l.*, the architect being Mr. Brydon, and the contractor Mr. R. T. Hookway, Bideford. On three sides the structure abuts on main thoroughfares, viz., the Quay, Bridge-street, and Allhalland-street. The main front and entrance are in Bridge-street, facing the Town-hall. Along the Quay the buildings extend 60 ft. in length by 50 ft. in height. The Bridge-street façade has similar dimensions, while in Allhalland-street the measurements are,—length, 50 ft.; height, 40 ft. Facing the river are three stories, the first affording accommodation for the Public Free Library and Reading-room, the second throughout its whole length comprising the new Bridge Chamber, while the upper story on this side, together with one or two additional rooms, is intended for the use of science and art classes. The stone used for the walls is from a local quarry, while the window-jambs, mullions, and ornamental portions are of Ham-hill stone. Quite a feature in the exterior of the edifice is the carved work by Mr. Harry Hems, of Exeter.

Liverpool.—Mr. G. F. Lyster, engineer to the Mersey Docks and Harbour Board, in his annual report, says of the Mersey Tunnel works:—On the Liverpool side a second shaft has been sunk in connexion with the Mersey Tunnel, and the drainage heading driven for a length of 385 ft. The tunnel is driven for a length of 490 ft., of which 365 ft. is lined with brickwork. At Woodside the drainage heading is driven for a length of 1,070 ft., of which 645 ft. is lined with brickwork, and the tunnel has been driven for a length of 760 ft., of which 400 ft. is lined with brickwork.

Lincoln.—A new "Coffee Palace" on the High Bridge, Lincoln, has been opened, in premises formerly occupied by Messrs. Fox & Son, ironmongers. The alterations have been carried out by Messrs. Martin & Sims, from plans prepared by Messrs. Watkins & Scorer; and the fittings, &c., were supplied by various local tradesmen.

VARIORUM.

A NEW and enlarged edition of "Elements of Acoustics, Light, and Heat," is published by Messrs. William Collins, Sons, & Co., and as this is the fortieth thousand, nothing need be said of it. A selection of questions from some of the former Government papers, with their solutions, is given, and will be found useful.——We have before us a new edition of another work on physics of much larger scope and more important character, namely, the "Elementary Treatise on Natural Philosophy," by A. Privat Deschanel, translated, with modifications, by J. D. Everett, F.R.S. (Blackie & Son, Old Bailey). The fact that a book of this size and character has passed through six editions gives satisfactory indication of the increased study of science.——It is proposed to publish by subscription (Infield, Fleet-street), in a handsome crown 4to. volume, "Bramshill: its History and Architecture," by Sir William H. Cope, bart. The history will be traced from the eleventh century down to recent times, with notices of its successive owners and occupants, the architecture, external and internal, of the present mansion.——Sir J. H. Ramsay has continued his investigations on the national finances in the fourteenth and fifteenth centuries, and an article on the accounts of Henry IV. (in continuation of a former one on the accounts of Richard II.) appears in the September number of the *Antiquary*.——The publication of a curious collection of the London signs of booksellers, publishers, and printers up to the end of the seventeenth century is commenced in the September number of the *Bibliographer*.——Under new auspices the *Pictorial World* will, on the 2nd of September, appear in a permanently enlarged form, and with every material promise of greatly extended popularity. There is to be a coloured supplement every week, the first series being portraits of the generals commanding the forces in Egypt. The name of Messrs. Dalziel wil guarantee the excellence of the engravings on wood.

Miscellanea.

The Water Supply of Leeds.—Mr. Meysey Thompson, in his paper on the history of engineering in Leeds, recently read before the Institution of Mechanical Engineers, said, on the subject of the town's water supply,—In connexion with the engineering of Leeds, it will be interesting to mention the works, now nearly completed, for supplying Leeds with water. The operations at present in progress consist of the construction of a reservoir at Eccup, about five miles from Leeds, which is intended to contain, when completed, 1,400 million gallons of water. This is about six months' storage at the present rate of consumption; and, as the water will enter in a regulated quantity at one end, and be drawn out at the same rate at the other end, it is anticipated that the purity will be much increased by slow deposition during so long a period. The water is, in the first place, obtained from the moors about twenty miles from Leeds, the area of watershed drained being 25,000 acres. This water is collected in three reservoirs at Lindley Wood, Swinsty, and Fewston, about thirteen miles from Leeds as the crow flies, their respective capacities being 750, 960, and 870 million gallons, with a total water acreage of 426 acres. From these reservoirs the water will gravitate to Eccup, through two 30 in. pipes, and from Eccup it will flow through a tunnel under Black Moor, and thence by a 40 in. pipe to the filter-beds at Weetwood, whence it will be distributed to the several parts of the town. The grand total capacity of the four reservoirs mentioned will be 3,980 million gallons. The present daily consumption of water averages 7¼ million gallons, the population supplied being about 300,000 persons. It may be stated that the present charge for water collected, stored, transmitted, filtered, and delivered to the consumers in Leeds is 1½d. per ton.

A Relic of the South Devon Atmospheric Railway.—Another of the towers, built some thirty-five years ago, when it was intended to work the South Devon Railway on the atmospheric principle, has ceased to exist. A few months ago it was decided to remove the tower standing near the village of Exminster, and it was suggested that dynamite should be used for the purpose. The work was entrusted to Mr. Wilson, clerk of works on the Powderham Estate. A few days since all the preparations were completed, and it was determined to light the fuse as soon as the mid-day express had passed. The greatest care and caution were needed to be exercised, as close on the one side was the railway and on the other a large pond, and Mr. Wilson's anxiety was to prevent the falling *débris* interfering with either. Holes were made in the tower for six cartridges. At the appointed time the fuse was lighted; in about three minutes the explosion followed, and the building, which seemed at first to lift slightly, suddenly collapsed like a house built with cards. The work was carried out with complete success; only about a wheelbarrowful of the *débris* fell across the down line, and this was cleared away in about two minutes. The tower was over 70 ft. high, and in its construction between 60,000 and 70,000 bricks were used.

Exhibition of Domestic Appliances.—An exhibition of domestic appliances is now open at the Agricultural Hall, Islington. The show is consequent upon the success which attended the exhibition of March last year, and has been organised by Mr. Chas. Messent, who was also connected with the Furniture Exhibition held last May. The exhibition will continue open until Sept. 7.

The Welsh National Eisteddfod.—At the Cymrodorion meeting on the 23rd ult., a paper by Mr. Cave Thomas, "On making the Eisteddfod a greater Institution, and connecting with it Scholarships and Athletic and Military Sports, and having a Permanent Building for it," excited much discussion, the provision of a movable building being largely advocated.

Middlesbrough.—The Church of St. John, Middlesbrough, is about to have added to it a spire. The architects are Messrs. Alexander & Rowlatt, of Middlesbrough, and Mr. T. Dickinson, of Saltburn, is the contractor for the work.

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Examinations of the Society of Arts, Manufactures, and Commerce. — Programme for 1883.—The attention of secretaries of institutions and others interested in the Society of Arts' examinations is especially drawn to the fact that important alterations have been made in the examination system. The following are the principal points in which changes have been made since the publication of last year's programme:—1. The examinations in subjects of "Commercial Knowledge" have been renewed. 2. The three subjects, "Clothing," "Cookery," "Housekeeping," &c., will be comprised in a single paper, under the head of "Domestic Economy." The examination in "Health" will be continued under the title of "Sanitary Knowledge." 3. A fee of 2s. 6d. will be required from each candidate in each subject, except Practical Music, for which special fees are required. 4. No prizes will be given in any subject. 5. Certificates in three classes will be given. 6. The restriction as to the age of the candidates has been removed. 7. An examination will be held in any subject of "Commercial Knowledge," in addition to those already in the programme, for which twenty-five candidates offer themselves, provided the Council approve of the subject. The subjects of examination for 1883 will be:—1. Arithmetic; 2. English, including composition and correspondence, and *précis* writing; 3. Book-keeping; 4. Commercial Geography and History; 5. Shorthand; 6. French; 7. German; 8. Italian; 9. Spanish; 10. Political Economy; 11. Domestic Economy; 12. Sanitary Knowledge; 13. Theory of Music; 14. Practical Music. In addition to the above subjects, the Society will provide for an examination in any other subject which may fairly be comprised in "Commercial Knowledge," and of which the Council approve, provided not less than twenty-five candidates are guaranteed for each subject. The examinations in all the subjects, except practical Music, will be held on the evenings of Monday, the 9th, Tuesday, the 10th, and Wednesday, the 11th of April. The complete programmes can be had upon application to the Secretary of the Society of Arts, John-street, Adelphi, W.C.

The Public Offices Site Bill.—The protest in the House of Lords against the Public Offices Site Bill (signed by Lords Redesdale, Fortescue, De L'Isle and Dudley, and Stratheden and Campbell) expresses dissent from that measure because the Parliament-street and Great George-street site has long been considered the proper one for the Admiralty and War Office, and a considerable amount of property on it has been purchased by Government and a large extent of public land left unprofitably vacant for many years on that account; and because, among other reasons, the Bill only gets possession of the Spring Gardens property unaccompanied by any plan of the manner in which the buildings to be erected on it are to be applied to the Admiralty and War Office respectively, or of their architecture and elevation, leaving it uncertain whether the site will afford sufficient accommodation for those two great offices, or how far the aspect of the Horse Guards and Parade may be deteriorated by the new buildings. Further, because if the Admiralty is transferred to a new site, the present Admiralty buildings will give the means of concentrating in an economical manner, in a most convenient situation, a number of small offices now scattered over the town at a great expense and inconvenience.

Houses in Barnet.—James Rogers, the secretary of the Maldon Loan Company, London-road, Maldon, Essex, has appeared at the Barnet Petty Sessions to answer a summons charging him with having allowed a house to be occupied without giving to the Local Board the requisite notice. Mr. Rumble, surveyor to the East Barnet Valley Local Board, stated that a row of houses belonging to the defendant's company were being built at East Barnet. The architect was informed that when the houses were finished notice would have to be given to the surveyor so that he could inspect the houses and certify whether they were fit or not for habitation. A few weeks ago witness went to the houses and found one of them finished, and persons living it. The defendant, in answer to the charge, said that the builder of the houses was instructed by him when the houses were finished to give the necessary notice, but this the builder had failed to do. The Bench ordered the defendant to pay 20s. including costs. The fine and costs were at once paid.

Excavations at Lewes Priory.—These excavations have been pushed on steadily during the last fortnight, and despite the huge accumulation of *débris*, amounting to as much as 12 ft. in depth in most places, which has had to be cut through, it is now possible to make out more or less accurately the disposition of the buildings whose sites have been excavated. The substructure of the dormitory which occupies most of this area is formed of a number of square chambers communicating with each other by wide single arches or double doorways. Most of these, however, have been filled in at some later period, but prior to the suppression, with chalk masonry, probably on account of some threatened collapse of the Roman work. The walls are in some places still covered with a most perfect coating of plaster,—a mode of treatment far more prevalent in olden times than is usually supposed. By kind permission of the London, Brighton, and South Coast Railway Company, excavations have been made in the sides of the cutting through which the railway passes. These were most successful, resulting in the finding of the north-east angle of the refectory and the adjacent angle of the cloister. Behind these was uncovered an ample circular staircase or vice, corresponding in position with the one still existing on the south. It is to be hoped the railway company will cause these to be preserved to view and not covered up again. The line of the east wall of the cloister has been carried across the railway, and the continuation of it which formed the great south transept wall discovered in the bank. Similarly the north wall of the refectory has been opened out near the underground conduit, commonly known as the "lantern" or prison" (!). It is now possible to ascertain the exact site of the cloister, and therefore of the nave of the great church of which a fragment of the west end was uncovered some years ago. Next week we hope to announce further discoveries in connexion with this last most interesting point.—*Sussex Advertiser.*

TENDERS

For works at Salthill, for Mr. G. Hughes:—

	Stables and cottage.	Steps and gates.
D. C. Jones & Co., Gloucester	£1,222 0 0	£50 0 0
Ashfold, Slough	1,082 0 0	51 0 0
J. Deverill, Slough	996 0 0	48 0 0
A. L. Oades & Sons, Egham	985 0 0	49 0 0
J. Willis, Windsor	970 0 0	54 0 0
T. C. Cordery, Salthill, Slough	910 0 0	52 0 0
W. P. Reavell, Windsor	897 0 0	40 0 0
Martin, Maidenhead	893 0 0	42 10 0
R. Squelch, Egham*	879 0 0	50 0 0

* Accepted.

For making roads and drains to three acres of land in the city of Gloucester. Mr. E. J. May, architect, 3, Great James-street, London:—

A. King	£557 0 0
J. Meredith (accepted)	521 0 0

For the erection of residence at Winchester, Hants, exclusive of principal finishings, for Mr. R. H. Gudgeon. Mr. Fred. A. Walters, architect. Mr. W. H. Brayshaw, surveyor:—

Sims	£2,172 0 0
Fielder & Sons	2,080 0 0
Saunders	1,989 0 0
Bull & Sons	1,930 0 0

For repairs inside and out to nineteen houses, Dragoon court and Montague-street. Messrs. Stone, surveyors:—Martin & Goddard (accepted).

For rebuilding fronts and inside repairs to two houses, 30 and 31, Umberston-street, for Mr. Mark Jacobson:—Martin & Goddard (accepted).

Accepted for one pile of Jennison's patent smokeless Decker baking-ovens, for Mr. John Gee, Stanley-street, Macclesfield:—W. F. Mason, engineer, Longsight, Manchester.

For the erection of a new residence, and additions and alterations to house at Petworth, for the Right Hon. Henry Baron Leconfield. Mr. Edward Burstow, architect, Horsham. Quantities by Mr. S. J. Thacker:—T. Ennor, Julian, & Co., London (accepted).

For repairs and decorations to Pentonville Congregational Church, King's-cross. Messrs. Saville & Son, architects, 1, Argyle-square, W.C.:—

W. Broil	£532 0 0
J. Steel	416 13 6
T. Hawkins	411 0 0
W. H. Butcher	388 0 0
J. Denning	356 0 0

For building three vineries, peach-houses, conservatory, and other buildings, at Amersham, for Mr. C. L. Shepherd:—G. Darlington, Amersham (accepted).

For alterations to No. 55, King-street, Hammersmith, for Messrs. Chaplin Bros. Mr. Thomas Durrans, architect:—

Lamble	£335 0 0
Higgs	333 0 0
Birch	310 0 0
Bowles	295 0 0

For Bible Christian Chapel at Lee, Kent. Mr. W. Theobald, architect. Quantities by Mr. B. W. Swinstead:—

		Side galleries.
Boase	£5,048 0	£368 15
Dove Bros.	4,775 0	320 0
Charlwood Bros.	4,675 0	290 0
Gaisford	4,691 0	295 0
J. & C. Bowyer	4,659 0	298 0
Haisman	4,586 0	299 0
Adamson & Sons	4,398 0	298 0
Thos. Watson, Dulwich	4,387 0	274 0
Staines & Son	4,284 0	274 0
Tongue	4,214 0	245 0
Higgs & Hill	4,234 0	266 0
Morris	4,000 0	260 0
Jerrard	3,792 0	235 0
Banks	3,773 15	225 0
Kennard Bros.	3,759 0	220 0

For rebuilding the Storey's-gate Tavern, Westminster. Mr. P. E. Murphy, architect. Quantities by Mr. Edward Clark:—

W. T. Niblett	£3,575 0 0
T. L. Green	3,454 0 0
C. Ansell	3,440 0 0
G. Parker	3,337 0 0
B. Cook	3,331 0 0
H. R. Swain	3,298 0 0
Parrish & Hawker	3,035 0 0

For the erection of Able-bodied, Lunatic, Lying-in, and Receiving Wards, and Administrative Offices at Fulham-road Workhouse, for the Guardians of the Poor of St. George's Union. Messrs. H. Saxon Snell & Sons, architects. Quantities by Mr. Robert Griggs and the architects:—

Nightingale	£37,579 0 0
Crockett	37,258 0 0
Mowlem & Co.	36,500 0 0
Higgs & Hill	36,440 0 0
Perry & Co.	35,960 0 0
Peto Bros.	33,605 0 0
Adcock	33,241 0 0
C. Wall (accepted)	32,590 0 0

For alterations, new shop-front, fittings, &c. at Nos. 314 and 316, Oxford-street, for Messrs. D. H. Evans & Co.:—

F. Sage	£698 15 0
W. Salter (accepted)	693 0 0

For the erection of a villa for Mr. S. H. Dowsett, in Selsdon-road, Leytonstone. Mr. J. W. Brooker, 2, Railway Approach, London Bridge, architect:—

Shurmur	£1,143 0 0
Arber	999 0 0
Battley	997 0 0
Hubble & Trott	879 0 0
Body	830 0 0
Mansfield	807 0 0
Long (accepted)	680 0 0

For the erection of shop premises and basement for Mr. A. S. Robinson, 325, New Cross-road. Mr. J. W. Brooker, architect:—

Hatfield & Son	£419 0 0
Holloway	277 0 0
Hubble & Trott (accepted)	249 10 0

For the erection of stabling, &c., and van-sheds, for Mr. G. Hayward, 355, New Cross-road. Mr. J. W. Brooker, architect:—

Battley	£235 0 0
Hall (accepted)	234 0 0

For the erection of No. 12, New-street, at corner of Bedfordbury, Covent-garden, for Mr. W. Powell. Mr. J. W. Brooker, architect:—

England & Thompson	£2,231 0 0
Battley	2,099 0 0
W. & F. Croaker (accepted)	2,000 0 0

For shop and dwelling at Orpington, for Mr. G. Ogburn. Mr. G. St. Pierre Harris, architect:—

Townsend	£539 0 0
Treadwell	479 0 0
Taylor & Son	462 0 0
Wood	433 0 0
Wait	399 15 6
Haisman	379 0 0
Brett & Son	339 0 0

For house at Orpington, for Mr. J. Peckham. Mr. G. St. Pierre Harris, architect:—

Ottway	£564 0 0
Wright	529 0 0
Taylor & Son	516 0 0
Wood	499 0 0
Haisman	485 0 0

For three blocks of artisans' dwellings, to be called "Grove Buildings," to be built in South Grove, Mile-end-road. Mr. Robert J. Worley, architect. Quantities by Mr. R. C. Gleed:—

	Main estimate.	Add.*	Add.†	Add.‡
G. Green	£18,190	£201	£196	—
E. Lawrance	18,085	742	182	£215
J. Ryder-Hunt§	17,438	767	377	—
Perry & Co.	16,473	730	100	221

* If glazed brick dados to stairs, &c., in lieu of white Suffolk.

† If tile paving to entrances, corridors, and landings.

‡ If 4½-inch brick nog. partitions in lieu of 3-inch to be concrete.

§ Credit for brick nog. partition, 420*l.*

For house and boundary walls at West End-lane, Kilburn, N.W., for Mr. Theo. Vasmer. Mr. Henry John Hansom, architect. Quantities by Mr. Henry Smith:—

John Grover	£2,400 0 0
A. B. Scott	2,397 0 0
Lathey Bros.	2,350 0 0
Gregory	2,300 0 0
B. E. Nightingale	2,292 0 0
Wm. Smith	2,248 0 0
Richens & Mount	2,200 0 0
Turtle & Appleton	2,175 0 0
Stimpson & Co.	2,138 0 0
Dainton	2,130 0 0

For additions to No. 10, Loudoun-road, St. John's Wood. Mr. H. S. Legg, architect:—W. H. Butcher (accepted).

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For the erection of flour-mill, grain-warehouses, river and dock walls, Battersea, and other works (exclusive of ironwork), for Messrs. Marriage, Neave, & Co. Mr. Fred. Bath, architect, London and Salisbury. Quantities supplied :—

Lee & Co.	£12,000	0	0
Everett & Son	11,440	0	0
Wm. Shurmur	10,935	0	0
Wm. Crockett	10,457	0	0
Howell & Son	10,445	0	0
Treweeke & Co.	10,431	0	0
Garrud & Pink	10,383	0	0
J. T. Chappell	10,253	0	0
Henry Lovatt	9,979	0	0
George Howard	9,790	0	0
Mark Gentry	9,735	0	0
Vernon & Ewens	9,450	0	0
Munday & Sons	9,441	0	0
Bull & Sons	9,135	0	0
James Holloway	9,110	0	0
Perry & Co.	8,703	0	0
B. Cooke & Co.	8,677	0	0
Alfred Everett	8,614	0	0
John Garlick	8,499	0	0
Alfred Capsey	8,428	0	0
Edward Bentley	8,418	0	0
Samuel J. Scott	8,235	0	0
John Rider Hunt (accepted)	8,208	0	0
W. H. Wheeler	7,229	0	0
Ironwork.			
Walker, Pendleton, & Co.	£3,150	0	0
R. Moreland & Son	2,940	2	3
Ransome, Josselyn, & Woods	2,812	3	0
Homan & Rodgers	2,698	0	0
Vernon & Ewens	2,690	0	0
A. Handyside & Co., Lim.	2,668	0	0
Howell & Son	2,405	0	0
Matt. T. Shaw & Co.	2,249	0	0
Chas. Williams & Co.	2,229	3	0
B. Cooke & Co.	2,226	0	0
W. H. Lindsay & Co.	2,213	0	0
Rownson, Drew, & Co. (accepted)	2,172	15	0

For works on the Elmhurst Estate of the United Land Company, Upton :—

W. H. Martin, Upton	£4,160	0	0 !
Wilkes & Co., Bishopsgate-street	4,106	0	0
W. J. Botterill, 110, Cannon-street	3,884	0	0
W. Nicholls, Wood-green	3,359	0	0
J. C. Trueman, South Hackney	3,350	0	0
Piell & Sons, Kent	3,335	0	0
J. Pizzey, Hornsey	3,322	0	0
Woodham & Fry, Catford	3,320	0	0
J. Bell, Wood-green	3,312	0	0
J. Bloomfield, Tottenham	3,231	0	0
John Ball, Chiswick	3,132	0	0
Jesse Jackson, Leyton	3,111	0	0
Chas. Taylor, Upper Holloway	3,098	0	0
John Bentley, Chislehurst	3,036	0	0
D. Knight, Wanstead-park	2,997	0	0
J. Jackson, West Ham	2,990	0	0
T. Spurgeon, Forest-gate	2,926	0	0
Wm. Porter, Hackney	2,923	2	0
H. S. Pollard & Co., Burdett-road	2,849	0	0
W. G. Harris, Stratford (accepted)	2,435	0	0
H. Holloway, East Ham	2,395	0	0 !

For Infectious Diseases Hospital, Wokingham, Berks :—

Claridge	£905	0	0
Ford	725	1	6
Pilgrim	687	0	0
Idendon	650	10	6
Allcock (Camberley)	580	10	0
Smallbone	575	0	0
Margetts	568	0	0
Hawkin	559	0	0
Taylor	550	0	0
Neale	527	1	0
Weaver	498	0	0
Partlow (accepted)	473	0	0

For villa residence and drainage at Horsell, for Mr. Friers Marecco. Mr. F. Eggar, architect. Quantities by Mr. J. Bartlett, Woking :—

				Drainage.		
Hayward Bros. Lim.	£1,840	0	0	£234	0	0
Smith	1,599	0	0	129	0	0
Allcock (Camberley)	1,449	0	0	135	0	0
Whelburn	1,430	0	0	112	0	0
Harris	1,520	0	0	Inclusive.		
Gale	1,213	0	0	157	0	0

For additions to schools, Little Ilford, Essex. Mr. J. A. Gotch, architect. Mr. W. Birdseye, surveyor :—

E. Jenner	£1,120	0	0
H. Brown	979	0	0
C. Barnes	933	0	0
Parrish & Hawker	919	0	0
J. Brickell	844	0	0

For the erection of proposed school of art, with house adjoining, at Crouch-end. Mr. B. Swinstead, architect :—

Holmes & Son	£2,404	0	0
Payne Bros.	2,291	0	0
S. Hayworth	2,279	0	0
Gainsford	2,254	0	0
Durnford & Langham	2,216	0	0
Reid	2,200	0	0
Taylor & Parfitt	2,157	0	0
Southcott	2,060	0	0
W. Shurmur	1,980	0	0
Harris & Wardrop	1,944	0	0

For factory building, Sugar Loaf-court, Garlick-hill. Mr. F. Chambers, architect :—

E. Conder	£4,530	0	0
Holland & Hannen	4,429	0	0
King & Son	3,750	0	0
G. Shaw	3,500	0	0
T. Cox	3,498	0	0
J. Grover	3,479	0	0
Greenwood & Son	3,471	0	0
W. Shurmur	3,447	0	0
W. Brass	3,183	0	0

For repairs and alterations to Dyer's almshouses, Mildmay-park, for the Worshipful Company of Dyers. Mr. W. Waymouth, architect :—
W. Shurmur (accepted).

For orphanage in connexion with R.C. convent, Hassett-road, Homerton. Mr. C. G. Wray, architect. Quantities by Messrs. Linsdell & Giffard :—

Adamson & Sons	£7,648	0	0
Greenwood	7,314	0	0
Holland & Hannen	7,282	0	0
Bangs	7,249	0	0
Nightingale	7,140	0	0
Perry & Co. (accepted)	6,899	0	0

TO CORRESPONDENTS.

Advice (a manufacturer, who desires us particularly to give an account of one of his works, and sends us a description of it produced by some copying machine, and *utterly* illegible, is simply an idiot, and if he conducts his business on the same lines will probably soon find himself in the Bankruptcy Court).—Trudder (Portland cement, properly executed, ought not to require paint).—J. F. T. (under our mark).—F. L. T. (error did not appear in our pages).—Z. Z. (something depends on local arrangements, but we should say window must not project over public path).—E. J. M. (shall appear).—W. P. (ask Mr. Batsford, Holborn).—D. B.—M. & G.—F. W. S.—G. M.—H. H.—C. M.—M. F.—W. H. B.—M. & S.—J. N.—J. W. S.—E. R.—C. L.—S. F. C.—J. M.—E. A. L.—J. D.—E. G.—J. D. C.—G. T. C.—C. G.—T. D.—F. L.—J. R.—C. G. W.—Mr. B.—J. B C.—W. S.—Mr. T.—F. A. G.—R. C. G.—E. P. W.—S. H.—H. H.—H. S. S. & Sons.—W. L.—K. S. W.—W. J. A.—W. H. B.—E. C.—M. H.—T. W.

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We are compelled to decline pointing out books and giving addresses.

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Its construction allows of the angle of light being readily altered so as to reflect in any desirable direction.

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The Builder.

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The Social Science Association.

THE present Secretary of the Social Science Association, Mr. J. L. Clifford-Smith, has published, as a kind of commentary on the occasion of the twenty-fifth anniversary of the Association, a small book giving an account of the founding of the Association and of the work it has accomplished. Mr. Clifford-Smith has proved himself a most able and energetic secretary, upon whose engagement the Association may be congratulated; and therefore it is not from any want of recognition of his real merits in such a post that we express some dissatisfaction with the little volume in question, which, on his part, is an entirely extra labour, outside of the necessary duties of his office, the good intention of which we fully appreciate. But the account appears to have been compiled under rather a strong bias towards the legal side of the work of the Association,—a bias, perhaps, furnished partly by those who have supplied the author with some of the information and assistance which he acknowledges, and perhaps arising partly from the fact that the plan of the book seems to have been to dwell especially on those portions of the work of the Association which have led directly to special legislation. But this, though it may be the species of work most easily tabulated, certainly does not represent all that the Association has accomplished; and we complain that its sanitary work, and the influence which it has exercised on sanitary improvement, have been far greater and more important than the reader of this chronicle of the Association would be led to suppose; and in so far the said chronicle is unsatisfactory and rather misleading.

The Social Science Association originated, our readers may be reminded, in the house of Lord Brougham, who was president of several of the Annual Congresses, and was, in fact, appointed the first provisional president, Mr. Hastings, the president of this year, being the first general secretary. The specified object of the Association was "to afford to those engaged in all the various efforts happily begun for the improvement of the people an opportunity of considering social economics as a great whole." The advantage of such a generalisation of the subject and of opportunities of discussion was fully acknowledged at the time; and with the continually increasing complication of social life the necessity for this united action and general discussion certainly cannot have decreased, though some part of the work proposed may have been definitely accomplished as far as it is possible for the present to carry it. In regard to the classification of subjects treated by the Association, it may be observed that during the first three years of its existence the classification was under five heads, under the respective titles,—(1), Jurisprudence and Amendment of the Law; (2), Education; (3), Punishment and Reformation; (4), Public Health; and (5), Social Economy. A section for "Trade and International Law" was added to these in 1860; but in 1863 the secretaries were directed to consider and report to the Council "whether any and what alterations are desirable in the designation and business of the departments." A few words from the report presented may perhaps advantageously be quoted here. The questions of "designation" and "business" were taken separately, and in regard to the first it was suggested that:—

"The fundamental conception of the Association was that of a united body dealing with the science of society as a whole, but divided, for purposes of practical utility, into so many divisions as would answer to the leading divisions of that science. The style of 'departments,' rather than 'sections,' was proposed for these divisions, to show that they were intended not to be mere temporary adjustments, but to form a true and exhaustive nomenclature of the permanent heads of Social Science. It was supposed from the first that it might become expedient from time to time to divide more than one of the departments into sections, which might be accommodated with separate rooms at the annual meetings, and have the benefit of separate secretaries and committees. But it was also an essential element of the original idea that the division into departments should be scientific, and therefore exhaustive and final, and that any further development should take place by sub-division, and not by anomalous additions." In pursuance of this idea, the distribution was suggested into the departments of Jurisprudence, Education, Health, Economy, and "Art," or (as the last was defined) "the æsthetic recreative life of the people." These heads, the secretaries thought, seemed to exhaust the entire conditions of society; and it will be observed that the idea of setting apart a department for the consideration of artistic subjects, though only recently adopted, was officially suggested at an early stage in the history of the Association.

This idea of representative "departments," to be subdivided when necessary into "sections," has been adhered to, and the "Society for the Amendment of the Law" having been shortly after this date incorporated in the Social Science Association, the first department assumed the title which it still retains,—"Jurisprudence and Amendment of the Law," with sub-sections for International and Municipal Law and Repression of Crime. The other departments remain as suggested in the above statement. It was the suggestion at the time that the idea of a department for art should first be experimentally tried by forming a section of the Education Department for the consideration of artistic subjects. This, however, was not done, and the subject dropped until the formation of the Art Department in 1876. We confess we have often had our doubts whether the subjects now discussed in the Art Department might not have been as well and even more suitably classed under a section of the Education Department. The first subject for this year in the Art Department, for instance,—the Royal College of Music,—is really an educational subject; and artistic questions can only be treated in reference to their bearing on popular education or amusement. If the Department proceeded to deal with subjects more directly connected with artistic style and design, it would then be going out of the proper path of the Association, and assuming the functions of a lecturer on art,—a mistake which, in fact, has once or twice been made.

In regard to the two departments with which we are especially concerned, those relating to Health and Art, the questions to be discussed in the former at this year's congress are almost entirely questions of administration, and not of sanitary arrangement or construction; or where they are not merely administrative, they are essentially medical, and therefore touch less upon our special province than is usually the case. Of the questions to be discussed in the Art Department, two are of rather special interest. One of these is on the proposed Royal College of Music, the most important move in musical education in this country which has been made; and though this, as already observed, is a subject which might not unreasonably be supposed to belong as much to the Education as to the Art Department, we have very little doubt that music will receive more intelligent and sympathetic treatment in the latter than it would have been likely to receive in the former department, as at present constituted. The paper on this subject must, however, we presume, be rather one conveying information or making suggestions than raising a discussion, as the establishment of the college is now a foregone conclusion, and probably will, in every way, be advantageous to the promotion of musical education, though it will not necessarily do anything to quicken into new life an art which we fear has now pretty well achieved what it can achieve. The third question, in regard to the limits of conservatism to be observed in the treatment of ancient buildings, deals, we need not say, with a subject which has been hotly discussed of late years, and on which some calm and considerate criticism is very much needed; for at present the controversy seems for the most part to have oscillated between vandalism,—the vandalism either of reckless pulling down or of reckless restoration,—on the one hand, and bigoted and unpractical

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opposition to all restoration on the other hand. The advocates of the preservation of ancient buildings seem to ignore the present altogether, and to put aside all practical considerations in connexion with the present use of buildings, and all idea of the possibilities of an art of to-day, in favour of preserving intact every crumbling shred of the art of the past, good or bad; the antiquity of even a century being sufficient to render everything admirable. We are, both by conviction and tradition, as much opposed to wanton destruction or wrong treatment of old buildings as any one could be, but the present has its claims as well as the past, and we hope they will not be lost sight of in the discussion of the subject at Nottingham.

The second question of the Art Department, "In what way can the influence of art be best brought to bear on the masses of the population in large towns?" belongs to a class of questions which have been repeated in somewhat varying terms ever since the Art Department was started, and to which there is little hope of finding a definite answer; though we do not by any means say that on that account it is not worth while to ask the question. It is the repetition, in fact, of the almost hopeless query which arises again and again in the minds of those who contemplate the mass of struggling and unhealthy and unbeautiful life in our large towns, how shall we make this mass of human life more good, more healthful, and less ugly? The more fortunate among us find the contemplation and enjoyment of beauty and of beautiful things one of the chief and highest pleasures of our lives; the sources of this enjoyment are open to us, but they are not open to the poorer masses of the population; and if they were, where is the intellectual culture to appreciate and enjoy them? How are we, without entering on a system of artistic "pauperising," to bring within reach of the poorer class the sources of artistic enjoyment, and how, if we can accomplish that, can we give them eyes to see and heads to understand? The question is continually before us; and, as we have said, no definite answer, no infallible system, seems possible in regard to it: we cannot suggest any special course, and say "Do this, and you will humanise and refine the masses." Hence this class of question is sometimes rather too hastily regarded as vague and unpractical. It is so, doubtless, if we expect definite answers to it, or to find a definite course which will operate as an immediate and certain specific. But each answer given to the question may be one suggestion that may be acted upon by some persons, in some places, and may produce its effect, slowly and imperceptibly very likely; for in such a matter as this we can only expect to progress little by little; but it does not follow that any words spoken on the subject are thrown away because their immediate practical bearing is not very obvious. Let the question be discussed as much and as often as possible, and we shall by degrees get nearer the solution of it. One reason for being less hopeless about it than we might otherwise be is this, that it is after all not so much a question of educating people to understand art, as of bringing art to them to be understood. For art is, to a great extent, her own teacher, and familiarity with works of art has a happy tendency in itself to awaken the feelings and perceptions necessary for their enjoyment.

THE ART OF THE CALIPHS.*

ALLOWING fully for that Eastern exaggeration which must always be taken into account in reading of things Oriental, we have ample evidence of the extraordinary refinement of the surroundings of a caliph of the eleventh century, at a time when our Western civilisation was indeed almost entirely dependent for its luxuries on the East.

In these days, when we hear so much about decorative art, the suggestions for design given by the Arab historian in his relation of the contents of the pillaged caliph's palace are alone sufficient, one would think, to inspire many a work of beauty. Decorative artists, indeed, the Arabs seem to have been born, were it not that we trace in the conditions of their existence the causes of this characteristic feature of their art. With the luxury of the caliphs in Spain, all who have read in Washington Irving or elsewhere of the wonders of the Moorish rule in the Peninsula are familiar. A passion for dress and ornament pervaded all classes. That of the princesses and ladies of high rank, says Al Kattib, one of their own writers, was carried to a height of luxury and magnificence that bordered on delirium. They wore girdles and bracelets and anklets of gold and silver, wrought with exquisite art and delicacy, and studded with jacinths, chrysolites, emeralds, and other precious stones. The Moorish cavaliers were scarcely less extravagant. Their dress, arms, and horses' trappings were of the most gorgeous description. All this warlike luxury of the youthful chivalry was encouraged by the Moorish kings, who ordained that no tax should be imposed on the gold and silver employed in these embellishments, and the same exception was extended to the bracelets and other ornaments worn by the fair dames of Granada.*

In their immediate surroundings we have evidence that the Arabs early indulged in the most excessive luxury. The refinement and beauty of Persian art, after the conquest of Persia by the Moslems, influenced the whole of the Mohammedan empire. The passion of the descendants of the original simple Arab shepherds for beautiful objects, and especially precious stones, was insatiable. European travellers as late as the seventeenth century state that they could ensure larger sums for gems in the East than even at home.† Rich as had been the yield during centuries of the mines of Asia, when the New World was discovered, its precious stones soon found their best market in the East, though already Moslem art was on the decline.

Authorities divide the history of the Arab art, or rather architecture,—on which depend, it will be found, throughout all history the decorative arts in general,—into three periods. According to Gwilt, the first period stretches from the foundation of Islamism in the seventh century down to the ninth century, the period of Byzantine influence; the second extends to the end of the thirteenth century; and the third to the fall of the Saracen power in Spain in 1492.‡ But these divisions are applicable alone to the Moorish art of the Peninsula. The more recent authority of Bourgoin ("Les Éléments de l'Art arabe: Paris, 1879; and his "Arts arabes," previously cited) divides Arab art also into three periods,—the first extending from the commencement of the religion, the Byzantine period, during which the ultimate style was being formed, and closing with the twelfth century; the second extending from that century to the fifteenth, the Arab period proper; and the third extending from the fifteenth century to our day, the modern period, marked by a gradual decline. This subdivision we may accept as that of a profound student of Arab art.

The earliest monuments of Arab art, the art of the caliphs, do not carry us back further than the seventh century, previously to which time the people whom Mahomet called around him do not appear to have possessed,—or research has not revealed to us,—any architecture of their own. Their simple nomadic life was not one calculated to develop such, for of all arts architecture has been justly considered as that best revealing the habits and manners of a people. The first century of Islamism, one hurried series of brilliant conquests in Syria, Persia, Egypt, Western Africa, and Spain, was scarcely a period for artistic creation, and the few buildings erected are imitations of the Greek and Roman works of the Lower Empire. The first work of purely Arab origin of which history makes mention is the mosque built by the Caliph Omar on the site of Solomon's famous temple at Jerusalem (A.D. 637); to the mosque of Omar succeeded the mosque built at Cairo (now "old Cairo") by Amr or Amrou, the brilliant poet conqueror of Egypt (A.D. 644); then comes in order the mosque at Damascus, erected by the builder Caliph Walid in 705; all buildings, however, that in the course of centuries of repair, have preserved but little of their original structures. As for the famous temple at Mecca, the marvels of which all travellers have vaunted, it may be looked on much as Nelson's old flag-ship, the *Victory*, as a modern antique, so completely has it been rebuilt and restored at various times, though the original plans have been religiously respected.

It is unquestionably to Byzantine and Persian influences that the Arabs owe their artistic refinement; their conquering emigration northwards bore back these influences to the heart of the empire. Under Omar, the second caliph, we see entirely predominant,—so De Prangey tells us,—the influence of Persian arts and sciences. These first years of Arab art, the art of the caliphs, like the early commencements of the arts of all people, are, however, wrapped in much obscurity. Debased Byzantine and Persian influences mark deeply their architecture, but these influences, strikingly apparent as they are, we see modified by the exigencies of a new religion, by considerations of time, place, and largely by the important point of the materials which they had the means of "conveying" (in the modern sense of that Shakspearian expression) from the antique buildings. The ogive, or pointed arch, however, by its introduction, adds a fresh mystery to the inquiry, its appearance in the Mosque of Amrou, at Cairo, A.D. 642, being, as Fergusson remarks, "a curious contribution to the much-contested question of the pointed arch."

In its first two or three centuries of existence the art of the caliphs only shows the groping towards its ultimate development, contemporary, interesting to say, with the equally earnest and independent efforts of our own Northern architects to create our exquisite Gothic. No one, however, can fail to regret that the subject of Arab art has not received more study in the mosques of Jerusalem, of Damascus and Cairo, of Kairouan, of Aleppo, of Bagdad, of Persia, and all the countries occupied by the Arab conquerors; it is alone by a comparison of these edifices, combined with an intimate acquaintance with the Christian monuments of the Roman and Byzantine empire, that any definite results can be obtained.

In Sicily we have further traces of the Arabs, left by them during their rule between the tenth and twelfth centuries, a phase of the art of the caliphs of Spain, such as we see it in its more gorgeous development at Seville, at Granada, and Cordova in its famous mosque. Abderaman, amazed at the grandiose monuments of Roman architecture he saw scattered over Spain, endeavoured to emulate in his mosque the Classic marvels among which he lived; urged on by the beauty of the palace which his brother caliph of the East was contemporaneously building at Bagdad, he erected the wonderful mosque which has so long stood as one of the marvels of the art of the caliphs in Spain. His relations with the court of Constantinople, from which he obtained his workmen,—the Cæsar had sent him as a present a number of rare marble columns,—account fully for any strong Byzantine elements to be found in the work. But the Arab style in Spain, and the art of the Moorish caliphs, if it is not the same as that of Egypt and Syria, which it is not, is one that is strongly marked with the influence of its surroundings, and the character of the Moors, a very different people to the Egyptians. The art of the caliphs of Spain, the art of the caliphs of Egypt, and the art of the caliphs of Bagdad are based on the same lines; they bear a strong family resemblance, but, as must always happen in all artistic creations, they are deeply stamped with the influence of the surroundings in the midst of which they were severally developed; each is a study in itself, rich in suggestive beauties; each is differently gorgeous and refined; each has left on the world the mark of its passage, and the creations of each rank among the choicest products of human skill.

* See p. 297, *ante*.

* See Washington Irving's "Conquest of Granada," chap. i.

† See Reinaud's "Description des Monuments musulmans du Cabinet du Duc de Blacas." Pierres gravées. Paris. 1828. 8vo.

‡ See the "Dictionary of Architecture," published by the Architectural Publication Society.

The Education of Artisans.—In the Economic Science and Statistics Section of the British Association's meeting at Southampton, Professor Sylvanus Thompson read a paper on artisan education. He submitted that, apart from the question of the real educational value of science, there remained the fact that the teaching of science, at least in its elementary parts, given in a manner capable of illustration by reference to its application to arts and manufactures, was absolutely necessary for our artisan population. He urged that the provisions of the present education code fall far short of the necessities of the case, and directed particular attention to the introduction of manual instruction into the primary schools, a direction in which considerable progress was being made abroad.

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SOME PRACTICAL NOTES ON THE SEASONING OF BUILDING WOODS.

THERE have, perhaps, been as many papers written relative to the seasoning of wood as have been contributed to the discussion of any other purely technical question.

The subject is one to which theorists in particular have devoted a large share of their attention. The matter, indeed, has, for the greater part, been theoretically rather than practically discussed, and whilst an extreme degree of attention has been directed to issues of comparative unimportance, others of material importance have been overlooked. It is hoped by this paper to supply some of the deficiencies which exist.

Commencing upon our inquiries, it is perhaps as well, in the first instance, to inquire what the seasoning of wood really amounts to. It appears to be a prevalent notion that some extraordinary chemical effect upon the juices and saps of wood is brought about by the process of seasoning. Such theories as are, however, held by some scientists possess very little interest to those who make use of wood only as a constructive material.

For practical purposes a given effect is required. Wood is required to be seasoned, and what is mainly wanted to be known upon the subject is, what is the best and most economical method of obtaining the desired result? By what is commonly known as seasoning wood is meant nothing more than drying wood.

Wood is to be dried only by the moisture being evaporated from it. It is an elastic material, and in degree as the moisture exudes so it will shrink. It is also by nature somewhat absorbent, and it will therefore, under certain conditions, attract and retain moisture. For instance, if highly dried wood-work be fixed in a thoroughly damp house, the wood will absorb some moisture, and being of an elastic nature, it will re-expand just in proportion to the amount of moisture it has absorbed. When the house has become dry, the wood will also have dried, and the result of the expansion and afterwards of the contraction will be a number open joints. For these open joints the joiner may receive much censure, although it is highly possible that he may not have been at all in fault. Indeed, if the wood he has used has been highly dried it will, in all probability, have absorbed more moisture than would have been the case if it had only been partially dried, and so when it shrinks again the openings left will in such a case be wider.

Woodwork to be fixed in a newly-erected and, consequently, damp building, should have received a coating of paint before being fixed, as, in such a case, it will not absorb moisture.

These remarks may suggest the inquiry why unpainted woodwork does not continually undergo a process of expansion and contraction. The question is not a difficult one to reply to, although it has not usually been answered in our way.

It is well enough known that wood, in a living state, forms a skin over any exposed portion. Thus, if a branch be lopped off a tree, the injured limb for a time will bleed its sap. Nature, however, supplies its own protection against injury, and a thin skin is soon formed over the injured part, which stays the bleeding. It is the same, to some extent, with dead as with living wood. Flooring-boards, for example, which have been laid down for ten or almost any other number of years, will, if planed over, enter upon a second process of shrinking or expansion, according as they are situated in a dry or humid atmosphere. To season wood, then, is simply to dry it, and that means nothing more than evaporating the moisture from it. For all practical purposes, therefore, we have only to inquire,—

First, what amount of seasoning is required?

Secondly, what is the best way to accomplish the seasoning process?

The issues are, consequently, narrowed very considerably.

When we ask ourselves what amount of seasoning is necessary, we must hold steadily in view the requirements of the different purposes for which wood is employed.

And, first of all, it should be clearly explained that foreign-sawn building woods undergo a limited amount of seasoning before they leave the other side of the water. It would not at all do to store green wood into the unventilated holds of ships, for if such a thing were done, the wood would at once commence to "sweat." In a short time it would become covered with a mildew, and the sap-wood would become permanently discoloured; it would then have depreciated very much in commercial value. To avoid such an occurrence the wood is for a time seasoned abroad under large wooden sheds before being shipped. It is in consequence of being seasoned under sheds that it usually reaches us of such an excellent colour and clean appearance.

The bulk of the foreign building wood imported is used for bearing or joisting purposes. For such purposes it is not necessary that it should be at all seasoned beyond the preliminary seasoning it undergoes previously to shipment. It is a common error to suppose that old wood is in any way better for bearing purposes. A kind of vague idea has generally existed that old wood is necessarily seasoned, and that it is better that it should be seasoned.

In a vague way this view is held to, and yet no one can say in what way *bearing wood* is benefited by being seasoned. As a matter of fact, it is usually more or less *injured* by being old.

At the timber-yards, deals are, as a rule, most indifferently piled. They are not generally in any way protected from the weather, nor are they stored in such a manner as will insure any water which falls upon them running quickly off again. If not piled so that air can circulate through them, and if moisture be present, decay will rapidly supervene.

If the sun's rays be allowed to approach the ends and the sides of deals, a splitting process occurs. Should wet weather then follow, these cracks will become filled with moisture. When frost follows upon wet the splitting process continues, and the deals often become in consequence much shaken. Old deals will have endured these contingencies, and it may be taken for granted that they will not have escaped scatheless. Consequently, it is better on the whole to employ perfectly new wood for all kinds of bearing work.

Wood, however, that is intended to be made up into joinery work must be seasoned; and it is left us to inquire as to the best way of accomplishing the seasoning process.

There are two matters to be considered in relation thereto. First, the wood has to be dried. Secondly, it is not to be injured in the process of drying. The injuries that can be done to the material are those to be caused by the sun, rain, and frost, and by the dirt if it be stored in the immediate neighbourhood of a large town. The only sufficient protection against these influences is a suitable shed for the wood to be placed under. The sides and the ends of the shed must, of course, be open to admit of the wind circulating freely through the deals or boards required to be dried. Thus all that is required is a suitable roof. Such a roof should be exceedingly flat, so as to admit of the convenient piling away of the deals or boards under it. It should be made to well overhang so as to serve in the double capacity of a sunshade and an umbrella to keep off the sun and the rain. It should also be made capable of being raised or lowered at will, so that it can be placed just over any pile. It should be built in the most exposed part of the builder's premises, for no factor is so important in relation to the seasoning of wood as is the wind. If it blows a gale, so long as it does not upset the piles, it is all the better for the purpose of seasoning.

Deals and boards, when placed for seasoning, should alike be separated at regular intervals by evenly sawn strips of wood. It is better that boards should be seasoned when lying in a horizontal position, because they are then less likely to twist or warp whilst being dried. The long and the short pieces should be piled separately, and in no case should a long deal or board be allowed to overhang without any support, or it will be certain to twist. It is worth while taking care in this respect,—as it is only the more valuable qualities,—those intended to be used for joinery purposes, that are required to be seasoned at all.

Flooring-boards will probably have to be seasoned in the open, because room will not, probably, be found for them under the drying-sheds. If such a thing is possible, then it is all the better, but it is a matter of less importance that flooring-boards should be protected from the weather than any other kind of wood that is required to be dried. When flooring-boards are to be dried in the open, it is better that they should be "perched" on their ends rather than laid out in a horizontal or triangular form. When piled in a triangular form the boards are exceedingly liable to sway at their centres, and thus they will be likely to dry in a twisted form. They also hold at times a considerable amount of water in such a case. It is a good plan, when stacking flooring-boards on a perch, to pile the boards in pairs with their face sides together, as in such case the faces of the boards are kept clean, and thus the necessity of replaning the faces of the boards when laid is rendered unnecessary. As we pointed out in the commencing portion of this paper, seasoned boards will enter upon a second shrinking or expansion process if their newly-formed skins be removed with a planing-iron. There are those persons who are in the habit of drying their flooring-boards before passing them through the planing-machines. This is done so as to have a perfectly clean board when laid, but, for the reasons given, the result is not satisfactory, and further than this, clean faces can be preserved by adopting the practice of stacking the boards in pairs to dry.

For certain processes, such as mould-making, for instance, wood must be highly dried, and in such cases "stoving" may be resorted to with advantage. The main reform, however, required to be effected in respect to the seasoning of building wood appears to be the more general erection of suitable and sufficient drying-sheds, having open sides and flat movable roofs. Doubtless the erection of such sheds necessitates the expenditure of a considerable amount of money, but it is as well to bear in mind the admitted adage, that what is worth doing at all is worthy of being done well. There can be no doubt but that most consumers of wood suffer heavily through losses incurred in consequence of the depreciation of stock which has not been sufficiently well cared for. A well-designed and suitably situated drying-shed will permit of the wood which is stored under it being perfectly seasoned, and yet kept free from grit and dust, whilst the havoc which the sun, the rain, and the frost usually commit upon wood that is undergoing the process of being dried will be altogether avoided.

It should be well borne in mind that wood often suffers very much in consequence of its having been stored away in the sale timber-yards without any sort of protection, and it is to be hoped that ere long some protective provisions, in the shape of sheds, will be brought into general requisition by the timber merchants. Until such protective provisions do become generally established we would strenuously advise builders to buy, when possible, newly-arrived stock, and to take care themselves of that portion which they intend to devote to joinery or other similar purposes.

THE GENIUS OF SIR CHRISTOPHER WREN.

A GREAT deal of misconception prevails, I apprehend, as to the character of Wren's genius.

By the word "genius" I mean a compound of two principal faculties of the mind in their highest perfection: reason and imagination, accompanied by emotion. To these two faculties in combination, the godlike reason, as Shakspeare calls it, and imagination, all the greatest discoveries and enterprises of the world, as well as the great literary and artistic creations, are due. According, however, as one or other of them predominates, genius becomes either scientific or artistic,—the interpreter of nature, or the creator of the beautiful.

As I remarked in a former paper, entitled "Sir John Vanbrugh and his Critics," Wren's career was in the main the very opposite to that of Vanbrugh. While the latter, who was previously a dramatist and poet, was attracted to architecture by its poetic side, Wren, who was one of the greatest geometers of his time, and whose precocious mind had displayed itself not in poetic fancy and fire, but in the abstruser paths of philosophy, was drawn, by the unusual events of his day, towards its scientific side. Their minds had dwelt in two different worlds: Vanbrugh's amid fair ideal forms,—

> "Which craft of delicate spirits hath composed
> From earth's materials,"

or contemplating the touching scenes and events of human life; Wren's in that independent world, as Wordsworth has it, created out of pure intelligence, the world of the mathematics; and his ideal of architectural beauty and grandeur was derived chiefly from that

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inner realm of precise and regular geometrical forms, and infinity of beautiful curves. Neither of them came into the profession by the door,—I mean, from the feet of a professor. The key to Wren's architectural character, his constructive and scientific pre-eminence, will be found in his mathematical endowments and training. His strength lay in his geometry, which was his divining rod; and his works are examples of its power in architecture. They suggest that to be a geometer is to be almost an architect, or quite an architectural constructor; and that, like astronomy, building and engineering might be termed mixed mathematics.

It was probably chiefly owing to his general reputation for scientific skill that he was appointed by Charles II., in 1661, assistant to Sir John Denham, the surveyor-general; which was his first introduction to architecture.

What imagination he had received from nature would, of course, be none the worse for his mathematical training. As the imagination must be useful in geometry, which, as D'Alembert remarks, of all the sciences belonging to reason is the one wherein imagination has the greatest share,—in which I may add, thought can scarce move but on its wings; so geometry, which, from a few simple axioms and self-evident principles, leads the mind to the most general propositions and remote analogies, must be a discipline to the imagination as well as to the reasoning powers, strengthening and expanding it for the reception of vast and sublime ideas.

Whether this was the case with Wren or not, geometry dominated and regulated his ideas of beauty both in planning and profiling, and continued to inspire him throughout his career. It manifested itself in his magnificent plan for rebuilding the city after the Great Fire, in his numerous churches, and in both his designs for St. Paul's. It was by geometry and common sense, it would seem, that he solved the problem of adapting his ecclesiastical buildings to the form of worship of the Established Church, for which no precedent existed; maintaining the most characteristic feature of the Church of England, the steeple or spire and lantern, in a style never before applied to it, translating, if I may so term it, the Gothic steeple into Italian.

His churches, which are most of them the perfection of ingenious planning, are geometrical studies, as well as places of worship! St. Stephen's Church, in Walbrook, justly celebrated through Europe as one of the most beautiful pieces of planning ever produced, and a masterpiece of interior composition, draws all its charms from geometry. It is a gem that sparkles among architectural productions like some of the happiest minor efforts of the muse among poems, and leaves nothing to be regretted save that the same principle of composition had not been applied to the exterior, where a like combination of geometrical solids would have been equally satisfactory.

It was through his geometrical propensities, doubtless, that he became enamoured of the peculiar central feature of the plan of Ely Cathedral, and adopted it as the nucleus of his design for St. Paul's, which is no exception to the geometric composition and character of his works. Its appropriation of the octangular centre of Ely renders St. Paul's something more than a development out of St. Peter's, to which, indeed, Wren owed but little, and to which St. Paul's is in some important respects superior. He had as much right as Michelangelo to elevate the Pantheon or temple of Minerva Medicæ on the Temple of Peace; and combine the grandeurs of the basilica and circular temple. After seeing Perrault's colonnade of the Louvre on his visit to France, Wren's geometrical resources, his familiarity with cylinders, cones, and spheres would soon impregnate his mind with the grand form of St. Paul's. But his predilection for geometrical regularity and precision leads him, ashamed of the picturesque clearstory, to disguise it by the false upper façade; and by the circular apse and transept porticos to still farther diminish the simplicity called for by the domed rotunda above.

Again, his fondness for circular forms and skill in arching, leads him to arch all the windows, though square heads would have been more expressive of power, and more in harmony with trabeation. Arches without and niches within, and pendentive domes covering both nave and aisles throughout,—circular or circular-ended chapels and vestibules, octangular vestries, elliptical and geometrical staircases, and niched windows, all breathe of the geometer, as do also the domes of contrary flexure of the west towers, and the consoles or trusses to the upper entablature surrounding the building. As, to a geometer, an isolated Corinthian column must be a fascinating object, for its susceptibility of receiving subtile lines in its entasis, &c., as well as for its capital, which is a singular instance of beautiful natural forms attuned to the music of geometry in the abacus and volutes, isolated columns play an important part in St. Paul's, in the west front and surrounding the dome, which two features, caught in a certain relative connexion, present one of the finest architectural scenes in existence, and have the advantage of St. Peter's in being seen along with the flanks,—the flanks in the latter being hidden by Bernini's colonnade, which had better have *surrounded* the church, like the ancient peribolus, or sacred court.

The same principle pervades and governs his first design for St. Paul's, which is singularly geometric in its aspect, both within and without, and seems a product of fancy's loom rather than imagination's,—gravity and solemnity therein being sacrificed to geometrical grace.

It is true that all architecture draws more or less on geometric forms, and that there are other buildings besides Wren's, some of the greatest in the world, which are strikingly geometrical in their composition. The Church of St. Sophia, at Constantinople, which was the model of the Byzantine churches and Turkish mosques, of which the dome and pendentive dome are the chief characteristic, would seem to have had but little other inspiration. But there is no instance, I believe, of this source of inspiration being so clearly manifest throughout the works of one man as in Wren's, which stand out distinctly from all others in the same style, and show themselves diametrically opposite to the wild naturalness of the Gothic, with which he had little or no sympathy.

Such, I think, is the characteristic of the genius of Sir Christoper Wren, which is not more remarkable than it is admirable in itself. His thus sublimating and utilising his mathematical learning and resources reminds me of Milton's use of his historic and literary lore in his divine poem; and proves that he was not without the vital faculty of assimilation,—the power that turns to its purposes whatever material is submitted to it.

This characteristic trait is valuable inasmuch as it contributes to his originality, which is a chief merit of Wren, who throughout his career exhibits an unfolding of himself, and no yielding up of his own peculiar personality to form himself on the model of another. As evinced by his letters from France, he was anxious to enrich his mind and increase his materials by seeing as much as possible of the best work in the style he was pursuing; but, instinctively discerning the true nature of architecture, and proper use of its examples, he poured ancient and modern thought into new moulds, and evermore held an original and philosophical relation to architecture.

In the general conception of St. Paul's he emulated and sought to excel St. Peter's, as well as to embody a broader and more philosophical idea than the Western Mediævalists had dreamed of. His choosing the dome, the sublimest of all forms by which space can be covered, as its crowning feature, and surrounding it with the unbroken Corinthian peristyle, the grandest accompaniment it could receive, shows, I think, that he was aiming, as Michelangelo was before him, not to breathe into stone any special or definite expression by which the whole is made to sympathise with man's devotional feelings, and becomes a petrified liturgy, if I may so picture it, but, however vainly, at an ideal, abstract temple, worthy, by its intrinsic beauty and sublimity, to be a dwelling-place for the Most High, which was something like a return to the governing idea of Solomon's Temple at Jerusalem.

Such, probably, was the aim, in this his greatest work, of Sir Christopher Wren, who was a true architect, as well as a renowned mathematician and astronomer, and truly great man.

Nevertheless, his acknowledged failure in the designs of most of his numerous steeples, though they are said to be based on principles laid down in his writings, may justify a doubt whether he had the strength of imagination or poetic fancy and feeling to conceive graceful architectural forms independently of his geometrical resources; especially if we consider that the occasion was sufficient to awaken any faculty that had during his scientific days lain dormant in his mind.

With no vain wish to dim the halo that surrounds, and will for ever surround, the name of Sir Christopher Wren, I confess that I have long been under the impression, induced chiefly by the outlines of his steeples, that his artistic faculties were by no means commensurate with his scientific, which his inventions and discoveries at a very early age, and the frequent association of his name as mathematician with those of Wallis and Newton, would suggest were of the greatest; and that he had not the fire and imagination necessary to constitute an architectural genius of the highest order. There is nothing to weaken that impression in his greatest work, which, though all that I have pronounced it, is, nevertheless, remarkable for nothing so much as its deficiency,—its stopping short of its greatest attribute,—which has caused so much discussion of late years as to its proper decoration, and renders it more than probable that Wren never had a full conception of his great work in his mind,—in all its due and appropriate finish and ornaments, sculptural and pictorial. What was the chief glory of St. Sophia's, St. Mark's, the Alhambra, and most celebrated edifices,—that which, composed of the highest forms of living beauty, gives additional life, and the full expression or speech to a building, whose design offers the greatest opportunity for exercise of imagination and delicate feeling, while it requires a greater knowledge of effect than aught else,—is, for the most part, wanting in St. Paul's. That important element, in short, the possession of which gives to architecture its high place among the arts of design, *with* which it is the highest of them, and *without* which it is the lowest.

Neither this nor any other shortcoming in Wren, it should be remembered, could arise from want of opportunity; for no architect that ever lived had so great opportunities of displaying what gifts, natural or acquired, he possessed. He had not to break "poverty's unconquerable bar," nor any other bar that we hear of; nor to scramble, like later artists, in the mire of competitions; but during the fifty or more years of his devotion to architecture, uninterrupted by affliction or other casualty, he had commissions for all kinds of public and important buildings thrust on him; and if any wandering muse or spirit of art may be drawn to our service by the enchantments of knowledge, he had it.

My chief aim in these remarks is to enunciate what I deem an important truth, viz., that Wren was not of the highest order of architects, his works not being the perfection of architecture, as is generally, if not universally, supposed by the followers and advocates of the Classic schools,—a truth which, if accepted, cannot but tend to good by removing a false standard of excellence. It is,—

> "Only as admiration, hope, and love
> Are well and wisely fix'd,
> In dignity of being we ascend."

SAMUEL HUGGINS.

P.S.—The above was written before I was aware, through the *Builder's* review (Aug. 26) of Mr. R. G. White's book "England Without and Within," of his attack on the works of Wren. To the just remarks thereon, in that review, I would beg to add, though with strong doubts as to its title to further notice, that it is virtually a condemnation of some of the oldest and most ambitious structures of the critic's own country, as the Capitol at Washington, the State House at Boston, &c., which are domed compositions emulating the grandeur of the metropolitan church of the mother country; while most of the older Classic churches are echoes of Wren's or his pupils'. These and other American structures may, indeed, be deemed, in some sort, like the people, English emigrants, at least, descendants of English buildings, chiefly Wren's, which are repeated in a numerous progeny in the older States. For this reason, an Anglo-American attack on Wren's architecture is almost as great a blunder as would be an assault upon the Anglo-Saxon race.

It is absurd, however, irrespective of such consideration: if St. Paul's is ugly, Nature herself, in her grandest phases, is ugly; and if its round windows are ridiculous, then the canopy of heaven, the round earth, and the round human skull, are ridiculous; and the inventions of the arch and dome are mistakes.

S. H.

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THE PROPOSED CRYSTAL PALACE FOR PARIS.

ACCORDING to the Continental press, the above enterprise is of a comprehensive nature, including permanent exhibitions of collections of various kinds, galleries of painting and sculpture, rooms for gymnastic exercises and scientific experiments, concert-halls, &c. In this international museum of industrial art it is intended to exhibit all new inventions of an interesting character which may have been brought into public notice in other countries, while the concourse of foreign visitors will, it is supposed, be of value to French industry in making its productions more extensively known to the world at large.

The internal arrangements will comprise various groups of subjects, such as the progress of science in general, the productions of art and literature, experimental science, education, the development of the industrial resources of France, &c. The front of the building will look towards Paris, and its situation between the park of St. Cloud and the railway from Paris to Versailles will render it of moderately easy access. The structure will cover an area of about 17½ acres. The dimensions of the main building are approximately as follows:—Length, 1,640 ft.; height, 165 ft.; width, 460 ft. Amongst the remaining features of the scheme are panoramas on an imposing scale, a large amphitheatre for athletic sports, a model farm, and ornamental buildings of various kinds. It is proposed to erect in the grounds, and thereby preserve to posterity, such monuments of architecture as it may be found necessary to remove from their present sites in any part of France.

THE BRITISH ASSOCIATION ON THE DRAUGHT OF CHIMNEYS.

A FORMULA AND TABLE FOR CHIMNEY DRAUGHT.

THE attention of the Mathematical and Physical Section of the British Association was, on the 30th of August, called by their president, Lord Rayleigh, to the very humble practical inquiry as to the effect of wind on the draught of chimneys. It would be difficult more aptly to illustrate the true connexion between the pursuit of pure science, and the most everyday annoyances of domestic life (with a view to the removal of the latter), than is afforded by this announcement. As a prime feature in the architecture of dwelling-houses the chimney demands a chapter to itself. And it is well that the basis of this chapter should be mathematical. With regard to draught, we have more than once had occasion to remark that it is a function of the height of the chimney-tubes. We do not, of course, apply the remark without modification to the details of ill-constructed chimneys. Many chimneys smoke from positive ill-construction, having a narrow part, an ugly bend, or a downward portion, in their conduit, which the normal draught is not strong enough to overcome. Others smoke because they form the shortest channel by which air can enter the house to supply the draught of the loftier chimneys. Where there are two chimneys in one room, and the doors and windows are closed, lighting a fire in one chimney will ordinarily cause down-draught in the other, as the readiest mode of maintaining the atmospheric equilibrium. In most cases, however, the addition of a yard or so to the height of the chimney-stack, supposing that to be already above the highest part of the interior of the house which it ventilates, will prove more useful than the addition of any of those curiously contorted and wholly non-pneumatic contrivances, the endless variety of which tortures the eye of the mechanically-minded man as he whirls along the suburban railways.

Apart from the questions of normal draught, and of internal regularity of construction, is the effect of wind on the draught of chimneys. This varies very much with the locality of the house. It may be said to be primarily a question of site. Neither is it a question always to be settled, *à priori*, by the architect. The action of wind, although, of course, always determined by physical laws, is so subtle, and so delicately affected by slight causes, that there are cases in which it is all but impossible to foretell it. What is more common than to have a chimney that answers perfectly well, except when the wind is in one particular point of the compass? And why does it then smoke? To be able to reply to this question is to be able to cure the defect; but how often is the difficulty regarded as insuperable? It may be useful to cite an instance of the deflection of wind in a manner that it is difficult to explain, and that could certainly never have been anticipated. On the lovely plain of Sorrento, sloping towards the Bay of Naples, in the midst of its own gardens and orange groves, stands a stately palace, which, in the days when the name of Nelson was a terror on the seas, was a favourite haunt of the Queen of Naples, and was not unfamiliar to our great sea captain. There are no rocks, lofty buildings, or overhanging trees in the immediate vicinity, and nothing that is apparently likely to interfere with the free movement of the wind, from whatever quarter it may blow. The aspect of the front of the palace is northerly, looking over the Bay towards Naples, and the hills behind it. On a few occasions,—some three or four times, perhaps, in the year,—a strong east wind sweeps across the peninsula, and is clearly indicated as to its course by the straight and level stream of smoke that it drives from the cone of Vesuvius across the Bay. But on these occasions, the current is so deflected by the northern shores of the Bay, fully twenty miles distant, as to drive on the front of the palace; that is to say, in a direction pointing nearly due north, with such force that it becomes necessary to close the *persiani*, or outer window-shutters, in order to preserve the great drawing-room windows from being blown bodily in. Full familiarity with the spot does not afford any very satisfactory explanation of the phenomenon, of which, however, we can speak from repeated personal observation.

This, perhaps, may be regarded as an extreme case. Nevertheless, it is typical of not a few instances in which currents may be detected after a house is built, the existence and effect of which the architect cannot be blamed for not having foreseen, but the influence of which on the draught of his chimneys will be, for so many days in the year, at once irresistible and intolerable. There is now absolutely nothing for it, in such a case, but to put out the fires. We do not say that a cowl may not be of use, but, on the other hand, we cannot speak from any experience of the action of a cowl under such conditions.

Here, then, comes in the scientific part of the question as attacked by Lord Rayleigh. What is the effect of a cross current of wind on the draught of a chimney? As the direction of the wind is more and more downward, his lordship replies, the up-draught of the chimney diminishes, but does not turn backwards, that is to say, become down-draught, until the inclination amounts to about 30°. This is an important point at which to arrive. It is, however, obviously necessary to ascertain the precise features of the cases where the experiments were made, before formulating any absolute rule on the subject. The height of the top of the chimney, both above the sea level and above the basement of the house, is one fact needful to determine. The force of the wind is another. Thus, a wind of the velocity of ten or twenty miles an hour blowing downwards at a measured angle would produce a very different effect on the draught of a chimney 40 ft. high from that which it would have on the draught of a chimney 100 ft. high. If our recently published table on wind pressure (*ante*, p. 200) be referred to, it will be seen how important are these data for the solution of the problem.

Again, the maximum up-draught, we are told, is not with a direction of wind vertically upward, but with one making an angle of about 30° with the vertical. This is a result which it is without our experience either to confirm or to question. But it is clear that the cases must be extremely rare, if ever they occur, in which the top of a chimney would be exposed to a wind blowing upwards at a more acute angle than 30°. The determination of the same angle as the limit of downward and of upward efficiency is as elegant as it is unexpected.

A yet more practical part of the subject is the remark of Lord Rayleigh, that "a chimney with a T-piece at the top never produced an unfavourable effect on the up-draught, and only in one case failed to produce a favourable one." Professor de Chaumont thought vertical ends would increase resistance to the up-draught. So do ninety-nine people out of a hundred. We have no hesitation in saying that Lord Rayleigh is right, and that general opinion is wrong, provided, that is to say, that the protection of the chimney-top be rightly designed. And we say this absolutely and unhesitatingly, because our judgment is based on the two independent and concurrent sources of evidence afforded by observation and by direct experiment. In Southern Italy chimneys, no doubt, are comparatively few, but they exist in many buildings, and no Italian architect would dream of leaving a vertical flue or pipe open at the top to receive the tremendous downpour of rain which occasionally occurs in Italy with almost tropical violence. The aperture of the chimney is always roofed over, the smoke escaping by side apertures. The practice of the master-builders of the world is thus in accordance with the theory of the English scientific noble in this respect.

Experience, we have said, confirms the remark. And here, if we seem for a moment to depart from an admirable rule,—that of not mentioning in a scientific paper anything that may look like an advertisement,—we must explain that such appearance is deceptive. We have to refer to an admirable invention, which was made and sold some forty years ago under the name of Day's Patent Wind Guard. As to the validity of the patent it is not needful now to inquire, as in any case it must have long since expired. But what we lament is, that, so far as we can discover, this admirable invention has been entirely forgotten. In recent inquiries which we have instituted in order to obtain one of these wind-guards for our own use, we have been unable to discover that they are now made, although figured in some old trade-books. It may, therefore, be of much use to give such particulars as will guide any one in constructing an appliance of the kind.

Let us take, for example, the case of a chimney two bricks and a half, or 22½ in., square, with a flue of 9 in. square. A frame is to be constructed which would lie upon this hollow square, and allow bricks to be built on it to the height requisite to hold it steady. From this frame the guard itself rises as an octagonal shaft. Four pieces of sheet iron, or of slate, each 9 in. wide and 18 in. high, are fixed on the lower frame, 16 in. apart, so as to form four sides of an octagon, and the other four sides are formed of four similar plates, set at angles of 45° with the former, but so much within them as to allow 1½ in. to 2 in. clearance between the edges. These inner plates will just touch the outer angle of the 9 in. flue. A top, of iron or of stone, holds the upright plates together, and both top-plate and base-plate may be finished with a simple moulding. Sheet iron is perhaps the best material, but it is obvious that the contrivance may be made also in slate.

As to the perfect security which this guard effects from wind, we can speak not only from the testimony of those who have used the plan, but from careful experiment. With models of the wind-guard, made on the scale of 1 in. to a foot, set on small tubes of proportionate size, representing chimneys, which were fed with smoke from the combustion of paper, we have experimented by means of powerful jets of wind driven in various lines of force; vertically downwards on the top of the guard, horizontally at right angles to either side or angle, or in any other direction. In no case have we found it possible to produce down-draught in the chimney by the force of wind. On the contrary, the greater the force the better the draught of the chimney.

The *rationale* of this action may be illustrated by that of a much later invention, now in common use on our railways,—the steam injector. Let those of our readers who desire to master the subject, and have no more ready mode of doing so, refer to the diagram and description of this appliance which is given by Sir F. J. Bramwell, on p. 335 of a work recently published by Messrs. Longmans, under the title, "Railways and Locomotives." It will there be seen that "steam, escaping at high velocity through a circular orifice, induces a current in a body of water in connexion with that orifice, and carries it forward, at the less velocity corresponding to the increased weights of the combined stream of water and steam, but still at a high velocity." This stream passes into an expanding channel, where its velocity is further reduced, and so into the boiler, which is thus fed with water.

In the case of the wind-guard, the wind striking on the outer plate causes a current of proportional velocity between the edges of the outer and inner plates, and thus creates an

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induced current, which comes in aid of the draught of the chimney. The difficulty to be overcome is far less than in the case of the two fluids of unequal specific gravity. But the effect is so much the more powerful. We are familiar with the contrivance mentioned by Professor de Chaumont, which has been used for the protection of lamps from the dash and spray of the sea, as we believe, with admirable results. But it is a much more complicated, and therefore more costly, contrivance than the very simple one which we have endeavoured to rescue from oblivion. And we think that it is purely protective in its action, while the construction that we describe is not only protective, but absolutely aids the up-draught; and, moreover, the cone is more likely to become choked with soot. The brush of the sweep can easily ascend into the interior of the wind-guard, in case of any soot lodging there.

We have little doubt that any enterprising manufacturer who will discover one of these old wind-guards (they were made and sold somewhere in Pimlico, in 1842), make some to pattern, and introduce them to the trade, will at the same time do a good stroke of business, and confer a very great benefit, both on the architect who has to build in exposed and gusty situations, and on many a householder who now knows too well, and that to his cost, when the wind is in the east,—or in that quarter, wherever it may be, that is hostile to the good behaviour of one or more of his chimneys.

We are not acquainted with any mathematical formulæ intended for the guidance of the architect as to the height or draught of chimneys. It may, therefore, be of some service to provide a simple table for the use of the architect and of the builder, stating, in the first instance, the principles on which it is calculated.

The only cause of that upward movement which we call the draught of a chimney is the difference between the weight of the column of air and vapour in the shaft, and that of a column of equal height of the exterior atmosphere. This difference of weight must be enough to overcome the friction within the chimney-shaft and any resistance to free discharge at the top. It is obvious that the ascending volume consists of matter which, at equal temperatures, is heavier than atmospheric air, as it contains soot, or finely comminuted carbon, carbonic acid, sulphur, and other matters naturally heavier than air. Calling attention to the existence of these two sources of retardation, viz., friction and the loading of the column, it will be safe to neglect them in tabulation, as it is very difficult to determine the absolute heat of the ascending column, and a few degrees more or less will amount to quite as much as the elements thus neglected. With this explanation, the formula that regulates draught may be thus stated:—

$$D = (a.t. - a.t'.)\ h.$$

where D = the draught, $a.t.$ the weight of a cubic foot of atmospheric air at the external temperature, and $a.t'.$ the weight of a cubic foot of atmospheric air at the mean temperature within the shaft, and h the height of the chimney. It is obvious from a glance at this formula of how much importance the addition of a very few feet to the height of a chimney must be.

To increase the draught, we must increase either h, the height of the chimney, or t', the temperature of its contents. This explains at once the efficacy of the best appliances for increasing draught,—such as the bi-valvular registers, in this country, and the iron blind that is drawn down within the chimney aperture in the wood-burning fireplaces of France and of Belgium. The larger the aperture below,—the greater the quantity of cool air that enters the chimney,—the lower is t', and the less the draught. The more the air that enters below is compelled to pass through in close proximity with the burning fuel, the higher does t' become, and the more powerful the draught. This is the simple key to the whole theory and practice of draught produced by heat. Of course, in different conditions of the barometric column equal amounts of heat will have somewhat different effects. Hence we can see in a moment why our fires should "draw" so much better in clear cold weather than when the air is warm, or loaded with damp. The weight of a cubic foot of air at 32° Fahr. is 0·080728 lb. avoirdupois.

If the top of a chimney-flue were closed by a flap, or hinged valve (the weight of which we take as counterbalanced), the effect of the draught, or rather of the downward pressure of the external atmosphere which causes the upward draught, would be to lift the valve in proportion to the force of the current. If at the same time a strong wind be blowing over the top of the chimney (in the direction of the hinged end of the flap), its effect would be to force down and close the valve. The stronger current of the two will obtain the mastery, to the degree of its excess of pressure. This is also the effect, it will be seen, of cross current where there is no valve, but where the two currents more or less interfere with the movement of one another in the way shown by the action of the valve.

It is possible wholly to eliminate the ill effects of this cross current, and even to utilise it in aid of draught, by any contrivance that causes the external blast to produce an induced current from within the chimney; and this, it is easy to see, is the effect of the wind-guard.

In calculating the following table we purposely use round and approximate figures, as quite sufficiently accurate for practical purposes, and as more readily intelligible to many readers than more complicated mathematical expressions. We have also used the pressures proportionate to velocity as allowed by Smeaton, and given in Table I. of our recent article on "Resistance needed to the Pressure of the Wind" (p. 200, *ante*). Now, assuming, for convenience of calculation, an increase of temperature of 108° Fahrenheit (that is, from 62° to 170°), as imparted by a fire to the ascending column of air that passes over it up the chimney, we shall have an upward pressure of a fraction over 0·04 lb. for every foot of ascent in the shaft. This is represented in the following table of comparative heights of chimney, pressures, and velocities of current, calculated for that rise of temperature.

Table for Calculation of Chimney Draught.

Height of Chimney in feet.	Pressure due to 116° Fah. in pounds per foot.	Velocity of draught in miles per hour.
30	1·2	16
40	1·6	18
50	2·0	20
60	2·4	22
78	2·8	24
80	3.2	26

It will be proper, in making use of this table, to refer to the table (III.) given in the article previously quoted (*ante*, p. 201), showing the increase of velocity of the wind with the height obtained above the ground. Thus, in rising from 15 ft. to 50 ft. there is, as shown on that table, an increase in the local velocity of the same wind from 60 to 70·8 miles per hour. In raising a chimney from 15 ft. to 50 ft. we should obtain an increase of draught pressure of from 0·6 lb. to 2·0 lb. per foot, as against an increase of wind pressure, in a great storm, of from 20 lb. to 27 lb. per foot. The gain is more than threefold,—the loss less than 33 per cent. We mention this, not as a difficulty, but to show that proper consideration must be given to the whole subject.

It is, of course, apparent that if we have an ordinary fireplace, with a chimney 50 ft. high, and with that proportion of fuel and of draught which gives a current of twenty miles an hour to the ascending column of smoke, the aperture at the top of the chimney would be closed by a cross-current blowing at the rate of seventy miles an hour, almost as efficiently as by a valve weighted to 27 lb. per foot. The fire, in fact, would have to be extinguished. But the pressure of 27 lb. per foot, or 0·19 lb. per inch, is very trifling in comparison to the pressure of steam in a boiler; and as the action of the injector by induced current is an ascertained fact, it is plain that it is within the province of the engineer to make the hurricane, blow it ever so wildly, produce an induced current through a chimney, so that the draught shall in no way be reversed by storms. As to, that there can be no doubt, although this may be the first time that the statement has been definitely made. We have given what our own experience has led us to believe to be a simple and effective means of producing this induced current. If any of our readers can recommend a better plan we shall be happy to make it known.

We had put on paper some remarks on one or two other matters discussed at the British Association which appeared to us of striking industrial importance; but the novelty of a scientific investigation of a subject which most men are accustomed to regard with a hopeless shrug of the shoulder, as well as the importance of a thorough appreciation of a matter which comes so directly home to every householder and to every house-builder, is such that we have thought it well to devote to this question of draught all the space at present available. We think it cannot be too strongly insisted on that when, first, the subject of up-draught, and, secondly, that of wind-protection,—or rather wind-induced draught,—are seen to be thoroughly within the control of science, it will be felt to be unpardonable to be condemned to the great nuisance of a smoky chimney.

CONTINENTAL GATHERINGS.

THIS is the season of the year when archæology is the order of the day. Archæological societies are meeting in every corner of the country, and many a quaint district has been invaded by eager excursionists. In the annual obligatory *villeggiatura* of every family that respects itself an interest in antiquarianism forms a necessary feature; old churches, castles in ruins, and ivy-covered monastic buildings are pried into, sketched, and visited, guide-book in hand, and the mysteries of architectural styles become positively familiar,—during a few weeks,—to the more enthusiastic. This eager interest in archæology, expressed annually during the autumn, the various papers read by kind members, and the learned explanations of local *ciceroni* do not, fortunately, however, represent the sum of the labours of the profession. Its members work in most cases laboriously and modestly, amply rewarded by the humblest find. It is not all of them who have such a field for research as the director of the excavations at Pompeii, who, we hear, has been recently adding fresh stores of information to our knowledge of the buried city. A house has been laid bare in the ninth quarter,—so we learn from the *Zeitschrift für bildende Kunst*,—which, from the nature of the objects discovered, the beauty of the wall paintings and the fountain, must clearly have belonged to some wealthy patrician. Unfortunately, it would appear that the researches in this direction are threatened to be entirely stopped by the presence of a modern villa,—the Villa dell' Aquila,—built on the ground which has covered up the classic city. When, a year since, the state of the works was reported in these columns, the villa already promised some difficulties, which, it would seem, have not by any means been arranged. In the mean time the excavations have been resumed in another direction, towards the village of Torre dell' Annunziata, in what is known as the eighth quarter. Here, though the yield of antiquities has been but meagre, some most interesting facts have been brought to light; the neighbourhood was evidently one occupied by the poorer section of the Pompeian population. The houses are small, and in their architecture betray two different styles; from this fact it has been surmised that this portion of the city must have suffered during the first great eruption of 63 A.D., and then was rebuilt only to be totally buried in the final catastrophe of 79 A.D. One most interesting discovery has been made of a baker's shop with a large oven,—not a novel feature, it is true, as others have been found in Pompeii, but in the little room behind the shop were discovered the skeletons of two little children, the first that have been found in Pompeii; unfortunately no cast could be taken of the fragments, which crumbled to dust immediately on their contact with the air. A second shop was discovered in the neighbourhood, filled with a large number of beautiful works in terra cotta of Pompeian manufacture. The considerable number of objects in terra cotta found leads to the conjecture that it is a potter's shop that has been laid bare, as most of the objects are of the same form and colour, though of different sizes. But at the potter's the find of the most importance was that of a basket containing coal. Till now it has been held that the Romans alone knew wood as a combustible. The discovery is most curious, and, when made more generally known, is likely to arouse no small amount of interest. In this same quarter a street has also been laid bare, and under the [illegible] to 15 ft. of ashes have been brought [illegible] corpses of a woman clutching [illegible] a little

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ten-year-old child. From the emaciated appearance of the boy it is presumed that he may have been ill in bed at the moment of the sad destruction of the city, and the woman by his side had induced the poor little sufferer to endeavour to escape. An attempt made to obtain a cast of the woman proved hopeless, but her jewellery, two gold armlets and two gold rings, one of emerald the other of amethyst, beautifully engraved, have been saved. A cast of the body of the child, though wanting the right hand and left leg, has been successfully taken, and now forms an interesting addition to the curious little museum attached to the excavations; all the more valuable discoveries made at Pompeii going, it will be remembered, to the superb Museo Borbonico at Naples.

Johnson it was, if we mistake not, who, a century ago, remarked that there were very few subjects which could not be found treated by some French writer. True in his day, it is even more so now. Certainly the recently-published translation from the Chinese of a native work on the history and preparation of China, or, as we term it, Indian ink, may be said to supply a fund of information respecting a subject interesting to the architectural profession, about which it would be difficult to find much that has been written. M. Jametel, the translator, knows China well, and having lighted upon a Chinese manual descriptive of the manifold virtues of that indispensable element of architectural production, Indian ink, has considered the little work interesting enough to set into a language which, as Bacon has it, might be more "understanded" of the general public than in the original. The secrets of the wonderful industries of China, laden as they are with traditions of secular antiquity, are not easily fathomed by the European barbarian, so that there is a strong element of novelty about the information we are thus enabled to obtain. The art of writing is traced back by the Chinese to almost fabulous antiquity, the invention of ink being claimed by Tien-Tchen, who lived under the rule of Honang-Ti, 2697 to 2597 B.C. The ink at first was a sort of lacquer, then a black stone ground with water was used to write with, and it was only in the third century before the Christian era, under the dynasty of the Ouei, that, in the province of Kiang-Si, balls were made composed of lamp-black, obtained by the burning of a mixture of lacquer and pine-wood, and glue made either of fish-bones, the horns of oxen, deer, or rhinoceros. It is possible that this process was introduced into China by the Coreans, whose influence on the civilisation of the extreme East modern research has of late revealed. Be this as it may, it was under the dynasty of the Tang, seventh and tenth centuries of our era, that the manufacture of China ink obtained its highest perfection. The name of the great maker of that time, Li-ting-Konei, has been reverently handed down; his products were of such perfection that to this day they have never been equalled. It is not, however, from want of minute precautions that there exist deficiencies, as may be seen by M. Jametel's manual; indeed, it is interesting to read of the extraordinary care, the attention to details, the almost religious formation of Chinese industry. In the country of mandarins and of an antique literature, ink, as may be imagined, plays a considerable part; the Chinese, indeed, regard it as a protecting genius who is subdivided into as many little spirits as there are sticks of ink in the world. M. Jametel cites a work in which we are told that the Chinese conferred in antiqnity on ink the title of prefect of black perfume, and that in this position it was to have precedence of the brush, which only ranked as sub-prefect, and over paper, which occupied only the inferior post of head of a district.

It is, perhaps, the character of Oriental art, but it must be admitted by all, even its admirers, that we hardly look upon its creations in that same personal light that it is impossible to avoid in judging of European art. We regard it, as it were, as the spontaneous outcome of a state of existence in which we are disposed to say that everything is beautiful and tasteful, but the East, like the West, has its artists, who have succeeded in attaining an individuality, and whose names are treasured among the worthies of the country. It is a little curious that it has been undoubtedly the Europeans who first brought to the minds of the Japanese the peculiar merit of their national artist, Hokusai. Our Parisian contemporary, the *Gazette des Beaux-Arts*, in a recent issue, has given a most interesting sketch of the life and works of this great artist, the fertility of whose genius is positively astounding. The name Hokusai is, it would appear, a *nom de guerre*, just as with us we speak of "Phiz,"—poor "Phiz," now no more,—or as the French would speak of "Cham" and "Gavarni." During the course of his long life,—Hokusai was born in 1760 and died only in 1849, at the advanced age of eighty-nine,—the artist appears to have changed his name and signature more than once, a fact which has somewhat baffled his biographers in their researches. England and America may claim perhaps to have been the first to bring before the notice of the Western world the peculiar power of Hokusai's genius. Mr. Dickins, in his "Fujaka Hyakukei," or hundred views of Fuji, a work published in London two years since, gave a most interesting sketch of the life and works of this typical Japanese artist, who at the beginning of this century founded the existing modern school of Japanese art. To Dr. Anderson's writings, again, those anxious to learn more may be referred; as also to a recent article, written by Mr. Edward Morse, in the American *Art Review*. At a moment when we hear that the authorities in Japan have closed the art-schools when they discovered that the pupils were merely preparing to send their works to the annual Paris *Salon*, it is, indeed, refreshing to have brought before one the products of so characteristic an artist as Hokusai. All the quaintest inventions of the weird Japanese mythology he has pictured in the style that has endeared the art of Japan to so many. It was quite late in life, it would appear, that Hokusai came out. His first volume of rapid sketches, "Mangona," was only published in 1810; between that date and 1840 no less than thirteen other volumes appeared under the same name,—"Mangona" means rapid sketches,—together with a mass of other work which he executed. As he drew exclusively for the wood-engravers, his original sketches are of extreme rarity. In Japan the drawing is first made on thin paper, then applied to the block and, naturally, destroyed in the production of the woodcut. A few drawings by the artist exist; there are five, we learn, in the British Museum from the collection of Dr. Anderson, and, if we are not mistaken, we remember to have seen in the little Oriental museum of Munich a small gathering of most interesting rapid sketches made in Indian-ink by the exuberant Hokusai, whose art is the most intensely characteristic that it is possible to imagine. The mastery of touch, the rapidity of execution, the extraordinary understanding of the means at his disposal, and the peculiar possession of that indefinable quality of style, render Hokusai's productions,—though, like all Japanese art, outside the ordinary rules of our æsthetic standards, — master-pieces of skilful design worthy to rank beside the finest creations of our European art. He may be regarded, too, in the history of Japanese art, as its most characteristic embodiment. The art of Japan was originally of Chinese origin, and till the last century was singularly wanting in individuality; it was only about 100 years ago that colours commenced to be largely used in the production of the brilliant woodcuts that we all have learnt so freely to admire. In Hokusai's works Japanese art will be found, as we have remarked, embodied in its most striking features, and the school he founded only now threatens to lose its living character through the influence of European art-teachers. Still it must be remembered that it was we Europeans who first discerned the peculiar genius of Hokusai, who now ranks as one of the great artists of Japan.

The French Government have at length determined to institute a triennial *Salon*, the yearly *Salon* being, it will be remembered, in the hands of the artists themselves. The conditions of the Exhibition were published in the *Journal Officiel* not long since. It is not till next year that the exhibition will be held, from the 15th September to the 31st October; all works are admissible produced since 1878. Foreign artists, it may be mentioned, are invited to send in their works.

Egypt.—G. W. Bacon & Co. have published a "Large Print Shilling War Map of Egypt," a rough-and-ready thing, on which you can see at a moment just what you want. It includes, too, enlarged plans of special parts.

TASTE IN FURNITURE.

THERE have always been some critics who, in the midst of the much-vaunted modern advance in taste and art-matters generally, have expressed sage doubts as to the genuineness of the movement. It has become less difficult, it is admitted, to get really artistic work done than was the case some years since; we do not so entirely rely on foreign aid as formerly, but our captious critics are, we are afraid, only too right when they complain that any such work continues to be alone a luxury reserved to the few,—it is not a matter of course, as in the past. It is true that, in the present day, the love of luxury is far more generally spread than formerly; the increase of public wealth, the rapidity with which fortunes are amassed, the new conditions of a democratic society, as shown in the growing uniformity in dress and surroundings, all favour the spread of what a generation gone by were considered as the luxuries of existence. Fashion has further aided the movement, and, as one of its phases, the passion for the collection of *bric-à-brac*, while widely spreading a love of beauty, has developed a desire for the elegant and the superfluous,—a desire looked on as a sign of a certain intellectual refinement. This being the case, can it be said that art has gained? It is one of the qualities of taste that, as it becomes purer and more delicate, it grows more exacting. Now, is modern work more perfect? Treating the matter commercially, as the consumers increase in number the workmen, we are afraid, it will be found, are forced into hasty production to satisfy customers not only capricious and undecided in their desires, but, above all, anxious to furnish in the shortest possible time.

We hear a great deal in the present day concerning foreign competition. Museums and art schools, it is urged, are necessary to educate our workmen and our artists. The Government has warmly aided the work. Museums and schools, therein lies the remedy. On this point public opinion seems nearly unanimous. But under what form are these museums to be organised? In what manner should these schools give their instruction? It is certain that, in spite of the earnestness of those who have devoted themselves to the task, the results are found to be far from satisfactory. It is easy thus far to see the error; but how is it to be remedied? Museums and schools of design are necessary, but they are not an infallible panacea. As has again and again been pointed out, art is not a flower to be forced by artificial means. There are other modes. If our generation does not show in the productions of its industrial art the same perfection as in the past, what is the cause of this decline?

The first and principal cause is the obstinacy which is shown by a large number of persons of refinement in furnishing their houses solely with old objects, or copies of old objects. Every one is acquainted with friends in whom this love of the past has grown into a fanatic fetichism. None more than ourselves admire the beautiful works of the days when the greatest artists were wise enough not to confine themselves to narrow specialities, but vivified by their influence the whole field of industrial art, and stamped its smallest creations with grace and that indefinable quality of style. None more than ourselves have urged the necessity of the study of the work of those days. But we must not crystallise ourselves in our admiration. Is not the domain of the beautiful essentially a field without limits? And is there not a fear that if, from a distrust of ourselves, or inertia, we cease to excite the productive powers of beauty, they may become sterile, and refuse to yield their customary harvest? The sentiment of the beautiful is scarcely less dependent for existence than human nature on a supply of sustenance, and its sustenance is imagination. Now imagination pines and dies when it is not exercised on new objects. Coming to the point, what will be the result of the existing persistent mania which consists in surrounding ourselves only with old-style furniture and more or less servile copies of works of the past?

On the one hand, the designers for the trade seek their motives only from old authorities, and carry out their combinations just as we have machines made, on purely mathematical principles. On the other hand, the manufacturer's aim would lead him to the sole imitation of the old, with the direct result, from want of the creative faculties being

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exercised, that the laws on which the old models were produced would be overlooked, or soon become ridiculously burlesqued. Before this happens, is it not time to endeavour to prevent the spread of the misunderstanding which exists between the producer and the consumer? The public must understand that a manufacturer is merely in the position, so to speak, of an echo, answering to the call of the bad or the good taste of the purchaser. On the other hand, again, the manufacturer must understand that the public taste largely depends upon him and his satisfying promptly the demands of that taste. As long as he confines himself to producing old style, the chances are that old style will be all that is demanded.

Remains now another question. The time must come, or there will be no progress marked, when the public will understand the manifest superiority of commissioning and possessing for themselves a work of art, a piece of furniture, or what not, adapted, as was the case in the past, to the individual taste of the patron, instead of being a model made common by wide reproduction, however beautiful. Those who earnestly look forward to a real improvement in the taste of the public look forward to the day when what will be especially appreciated in the interior decoration of our houses will be in each possessing an originality of form, an architectural harmony of *ensemble*, a delicate choice of furniture, in keeping with the surroundings. The fashion for *bibelots* and *bric-à-brac* will have passed away, largely because the *bibelots* will have become impossible to find,—they will be buried away in museums, or their genuineness will be so doubted that the man of taste will avoid the possibility of imposition. Then at last we shall be able to return to the position of our forefathers in the matter of our household surroundings. They never troubled themselves as to whether their furniture was Chippendale or Louis-Quinze, Gothic or Renaissance, if their plate was Queen Anne or Irish. All they exacted was that their surroundings should be elegant, and thus they stimulated and created a race of original artists.

Here, however, an objection presents itself. Admitting that the public will understand the advance of these changed conditions, and surrounded by objects that, instead of diminishing in value with time will increase, as is the case with the works of the past, where is such an ideal public to be found? It can never be anything but very restricted in number. This is where the whole difficulty lies. In the existing state of our industrial arts it is perfectly true that it is alone the possessors of exceptional means who are able to employ artists to design their surroundings or carry out their tastes. This is the evil of the present condition of the industrial art-world, and till some remedy is found we can scarcely venture to vaunt our progress in taste. That eminent critic, the late Charles Blanc, has admirably laid down, in his recently-published "Grammar of Decorative Art," that the laws of taste are happily of so elastic a nature that they are perfectly able to accommodate themselves to different conditions, and are applicable to every degree of fortune. Although it is an essential refinement, taste has no need of wealth for its satisfaction, and a superiority of artistic sentiment has nothing incompatible with the utmost simplicity of condition. Taste, in fact, as has again and again been said, can be displayed as well in a modest habitation as in the most gorgeous palace. Again, it has often been laid down, the beauty of an object may be completely independent of the value of its material; one may produce a beautiful object without its necessarily being costly. This is beyond contest. But is it possible in the present condition of the art-industries to find these conditions fulfilled, always setting aside Japan, which seems to have attained this aim? The cause is only too simple to point out. Take the item of furniture. How is it that the best makers are unable to supply works of special taste at any thing like a price which is within the means of the less fortunate? They will tell you that the mere cost of production, payment of designers, "skilled" workmen, &c., is very considerable. They consequently can only deal with very wealthy customers, and those, even, are not many. As to the public at large, it is simply afraid to think even of such things; it is on the look-out for what is cheap and yet "artistic," and generally finds or contents itself with, what the trade supplies, [illegible] which, when not in execrable taste [illegible] grossly aggravating style, clumsily copied from old examples. What else can the public do?

Many years ago, for the question has long been disturbing the thoughtful, the Comte de Labarde,—whose share in the great 1851 Exhibition will by some be remembered,—suggested a remedy for the somewhat hopeless position in which the public and the manufacturers were placed. He suggested the formation of an establishment to produce, not for the public, but for the trade,—a series of designs and specimens of work to serve as models to the manufacturers; to carry out, in fact, the aim intended by the Sèvres establishment for ceramics and the Gobelins for tapestry weaving; to introduce art into the smallest objects of existence; and, above all, that they should be suited to the varied uses for which they might be intended.

This scheme, sketched out by an enthusiastic lover of art, a well-known Parisian manufacturer has announced it his intention to endeavour to put into action. He has long been preparing the plans, and in its smallest details he has studied the question. He has provided himself with a model of the establishment, and all the estimates are made out. No detail has been neglected. The interests of all employed will be bound up with the prosperity of the institution. A school of apprentices has been planned, and of a most practical nature, the pupils having each day under their eyes the example of their teachers. This is a most important and too often overlooked point.

The theoretical education at present given is certainly in many points good; but in what does it result? Does it form workmen? Does it not rather simply create artists, who are not suited for their work, and who, on leaving school, ignore the most elementary notions of the work necessary in the workshop, for which they should have been trained, or who disdain the manual labour, the use of which it has never been deemed necessary to show them the necessity? Young men will be found who, after passing four or five years of their life in the study of a profession, are incapable of practising it in such a manner as to gain even their bread; and what is the cause of this powerlessness and disdain for manual labour, at the bottom of all the evil? It lies in the fact that the masters in the schools have been able to give to their pupils only theoretical notions of design, without joining practice to example. To each school should be attached a workshop, in which the young people should, after their minds have been exercised, learn the use of their hands and tools. Under these conditions we may hope for a real amelioration of our art industries.*

*. The above is a free rendering of an article by M. Victor Champier that appeared in the pages of the March number of the *Revue des Arts Décoratifs*.

THE ENGINEERING CONGRESS AT MAGDEBURG.

THOUGH following somewhat closely the Hanover assembly of architects and engineers (see *Builder*, p. 313, *ante*), the attendance at the above congress was satisfactory as to numbers, and the proceedings throughout were of an interesting character. The business portion of the programme was disposed of on the 27th ult. at a preliminary sitting, so that the time fixed for the duration of the congress itself (28th to 30th ult.) was free for the discussion of various matters of professional interest, and for the festal gatherings which form such a prominent feature of such meetings in Germany.

At the opening sitting on the 28th ult., Herr Wolff, on the part of the Government, congratulated the Union of German Engineers on their assembling for the twenty-third time to discuss matters of interest to the profession. He remarked that in no branch of learning had such progress been made during the last ten years as in engineering, this development having led into new paths many important national industries,—amongst them, those connected with mining, traffic matters, and appliances for lighting purposes.

Herr Born (the Burgomaster of Magdeburg), in a congratulatory address of welcome to the Congress, referred to the fact that the industrial development of the city had been intimately connected with the progress realised during the last quarter of a century by German engineers. Such progress had, he observed, placed the nation on an equal footing with others, which was not the case at one time.

Herr Dittmar (of Eschweiler), the president, thanked the previous speakers for the sentiments they had expressed, and spoke of the encouragement the Union received from the appreciation of their efforts at such a centre of technical industry as Magdeburg.

Herr Peters (of Berlin), the secretary of the Union, reported that there were now 4,400 members, 74 per cent. of these belonging to local unions, and 26 per cent. being in direct communication with the central body. Out of the entire number, 235 are resident in foreign countries. He alluded to the labours of the various commissions which, during the past year, had been dealing with subjects affecting the interests of members, such as the questions of technical instruction in workshops, and employers' liability for accidents.

The scientific part of the proceedings was opened by Professor Fischer, of Hanover, with a paper on "Heating by the Storage of Warmth." His remarks were in some measure only applicable to the system of heating by means of tiled stoves so usual in Germany, respecting which he stated that the comparative thinness of the materials now commonly employed allowed them to give off heat in more or less exact proportion to the rate in which it was supplied to them. In this respect they differed from the old-fashioned stoves. He then alluded to the system adopted in 1843 by Grouvelle, for the improvement of the heating arrangements at the Mazas Prison in Paris. Heating by means of warm water had been known for a long time, and where storage of warmth was required, had been found to answer the desired purpose, but the want of mechanical power in hot water had prevented its successful application to the heating of large buildings. Grouvelle's principle was the utilisation of the mechanical power of steam in conjunction with the previously-known system of heating by means of hot water. The irregularity of the heat thus given off having been found to be a disadvantage, the efforts of those interested in that branch of engineering had of late years been directed to obtaining uniformity in the supply of heat, and according to the Professor's theory, this end is best attained by the water reservoir being placed in the cellars, the water being there heated by fire from underneath. The insertion of a stop-cock provides for the supply of the water to the serpentine pipes leading upwards, and for the regulation of the amount of heat. He remarked that it is without any real influence on the heat given off whether water or steam be employed, but he pointed out that with steam heating a comparatively large quantity of steam is used in the first instance, and hence a boiler of somewhat large dimensions is necessary. In conclusion, he stated his opinion that heating by means of the storage of warmth is only to be recommended where the mechanical arrangements allow of a uniform heat being maintained if necessary, while also providing for the increase or decrease of the supply, as may be found advisable. He attached particular importance to the storage of heat being arranged in such a way that there should be no difficulty in shutting off the heat from the rooms thus served to any extent which might be found desirable by its occupants, this regulation of the supply of heat being rendered specially necessary by the variable nature of the German climate.

In his paper dealing with "The Technical Application of Electricity," Dr. Zexener referred to the invention of an electrical machine in 1630 by Otto von Guericke, a citizen of Magdeburg, and claimed for him a priority of discovery in this branch of science. With reference to the electric light and its application to domestic lighting purposes, he spoke of the successful attempts of Herr Von Hefner-Olteneck to remedy certain imperfections of some systems, such as that by which the extinction of one light used to involve the extinction of the entire circuit of lights. He also spoke of a German invention which permits of the easy renewal of the filaments of carbon in electric lamps, which by their yellowish light seem likely to be more appreciated for many purposes than those which have the white light first known in connexion with electric illumination. He dwelt further on the advantages of lighting railway carriages by electricity, on which subject deliberations and experiments are now being carried on by railway administrations at Frankfürt and Strasburg. The lighting of railway carriages by gas caused an un-

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pleasant odour at times in the carriages and on the platforms. By means of the Faure accumulator, there is no danger of the extinction of the light from the stoppage of the train, although the motive force for the electrical apparatus is furnished by the rotation of the wheels. He likewise referred to the trials of transmission of electric force over distances of some magnitude, which will form a feature of the programme at the Munich Exhibition, and which it is expected will be of advantage to the cause of electrical science, particularly with reference to the question of electric railways.

The second day's proceedings were of varied interest, and included papers on "The most recent Improvements in Sugar Manufacture," "Progress of Boring Science during the last Ten Years," and "Salt-mining in the Stassfürt District." In connexion with the last-named subject an interesting excursion had been organised to Stassfürt.

On the closing day of the congress a number of interesting matters were brought forward for discussion. Herr Peters (the secretary) proposed that the necessary communications should be entered into between the Union and the German Government for the establishment of a fixed remuneration for engineers summoned as judicial experts, on the basis of the scale laid down by the Engineers' Congress at Gotha. This scale was as follows:—4s. per hour at their own houses, or 5s. per hour out of their dwellings, but in the same town. As to matters which involved travelling, it was suggested that the scale of remuneration allowed to attorneys in similar cases should be made legally applicable to technical experts.

Professor Inze, of Aix-la-Chapelle, spoke of the advantages arising from the adoption of normal models for rolled iron. The same member also referred at some length to the measures which the Union of Engineers was taking in conjunction with the Architects' and Engineers' Union to bring about the rational utilisation of the water-power of the German rivers. The sanitary advantages of the regulation and purification of rivers were dwelt on by him, and the instance was cited that, in a department of France where such measures had been carried out, the mortality sank from 40·5 to 25·4, and the average duration of life increased from twenty-five to thirty-five years, while the number of recruits who were not up to the medical requirements of the military regulations diminished from 52 per cent. to 9 per cent.

The excursion by boat to the Herrenkrug Park was an interesting feature in the proceedings of the congress. Messrs. Faber, the printers, presented each member of the congress with a large card of welcome, which was printed in presence of those members who visited the works in a body.

SALTBURN-BY-THE-SEA.

ONE of the pleasantest, though not the best known, of the bathing-places on the north-east coast, is that of Saltburn-by-the-Sea. It is comparatively new, and, depending largely upon the patronage of the large towns near it, it has felt keenly the depression in trade in the last few years, though its natural attractions are now again drawing numbers to it. It may be described as the extreme north-eastern point of Yorkshire, and is built on a bold bluff that overlooks Huntcliff Foot, one of the prominent cliffs on that coast. Down to a score of years ago there were at Saltburn only the old hamlet,—a few houses scattered around a conical little hill, and noted as the past resort of smugglers. The site was judged suitable for a new watering-place, and in 1863, the Zetland Hotel, erected at a cost of 40,000*l.*, was opened, and the new town shortly afterwards sprang into being. It is built on the top of the cliffs, 150 ft. above the sands, and whilst, on the one hand, these yellow sands stretch uninterruptedly for miles, on the east a deep glen, with almost precipitous sides, has been laid out as pleasure-grounds, and shows a mass of diversified foliage, beds, lawns, temples, and terraces. From the end of this a thick wood extends to beyond Skelton Castle, the ancient home of the great De Brus family, and in later years the resort of Sterne. This Skelton Glen, at Saltburn, is spanned by an elegant girder bridge, and the new town, its erections and appliances, point to the aim to fit it for the comfort of pleasure-seekers.

By sea and land its views are stately rather than magnificent. The gardens, from the seaward entrance to the Spa that terminates them, present many a striking landscape, especially when the bold bluffs of the hills are seen through the leafy screens, or the "iron reservoirs" of Cleveland present their bare peaks to the eastwards, with well-wooded valleys between, and occasional mansions such as that of Rushpool Hall striking sharply and clearly out from the steep sides of the glen. Seaward, magnificent views are seen. To the south there are at the little rivulets' mouths ancient fishing villages such as Staithes and Runswick, the abode of a hardy race of fisher folk; whilst to the north-east, clearly and distinctly, the manufacturing towns of the north are seen beyond the "golden sands," or across the estuary of the Tees. From these, "beneath their smoky veil," the eye travels along the sandy coast, dotted with one or two abodes of the iron manufacture, till it sees the ancient village of Marske and its now disused church on the higher ground, and then along the sand-banks and the cliffs that grow ruddy until the white-bricked houses of Saltburn glisten, and thence across the glen to red Huntcliff. Little streams brawl noisily down the glens, where thick woods cluster; but beyond these the country has a moorland aspect, and the mining village that dots the rising ground towards the hills gives it unwonted animation. It is a region that was sparsely peopled, remote, and unknown; industry has developed the mineral wealth of its hills, and for the rest and recreation of some of those so brought to the district, several seaside resorts have sprung up, not the least attractive of which is Saltburn-by-the-Sea.

In the past few months there have been indications of improvement at Saltburn, and in the district near it. The last link of the new line of railway that is to connect it with Whitby is just about completed; there has been a considerable revival in the demand for crude iron, and this will give to the iron mining district that belts Saltburn a marked impetus; and after long idleness the whole of the district seems to feel new life. The long-empty houses are filling, and the art of the builder is being again called into requisition. The sanitary organisations are busy, and there are all the signs that in the course of a few months there will be a further marked improvement in the district. The cloud that hung over the commerce of Cleveland has been lifted, and with brighter prospects there are to be expected brighter times for the pleasant health resorts that become barometers of the trade and commerce of the country.

THE PRESERVATION OF ANCIENT MONUMENTS IN SWITZERLAND.

THE time when as good as nothing was done in Switzerland for the preservation of ancient monuments of art is fortunately over. There has been a hard struggle for it; but now existing societies do much in this direction, and intended destruction is prevented by prompt action. It looked for some time as if the government of one canton (the town of Basel) were on the point of sacrificing one of the most beautiful choirs. It was proposed to take down the Barfüsserkirche at Basel,—dating from the beginning of the fourteenth century, and let in recent years as a warehouse,—and to use the site for the erection of a school. This scheme would probably have been carried out, but steps have been taken, the result of which will be the preservation for future generations of art-lovers of the most imposing and, next to that of Cologne Cathedral, loftiest choir on the Rhine. Basel Minster, also a most imposing edifice, and erected in the beginning of the eleventh century (by Emperor Henrich II. of Germany), is likewise undergoing thorough restoration. The works are proceeding very satisfactorily; the two beautiful western towers, visible from a considerable distance, have been restored, a great deal of labour having been spent upon them during the last two years and a half. It appears now that the works were highly necessary if the noble building was not to suffer to such an extent as to render later renovation almost tantamount to re-erection. The progress of those works and the rejuvenation of the venerable Basel Cathedral have given a fresh impulse to the work of restoration also elsewhere in Switzerland. At Bern, for instance, the question of completing the Minster there has been much ventilated. An acting committee has lately been considering a report by Oberbaurath Egle, of Stuttgart, on the possibility of completing the unfinished tower. A Geneva architect (Herr Leemann) has been occupied for some time in executing a large model of Bern Cathedral, as it would appear with the tower completed according to the original plans. The cathedral was begun in 1421, completed in 1573, and restored in 1850; but the tower was never finished, and is at present only 134 ft. high, and covered with a clumsy-tiled roof; but, if properly carried out, it will be of colossal dimensions. The model will not fail to incite the Bernese to exertions in the matter.

THE NEW COUNTY PUBLIC OFFICES, FISHERGATE, PRESTON.

THESE buildings have been designed to group with the buildings adjoining, which were erected in 1878 for the head quarters of the county constabulary. The whole pile is now completed, and occupied by the officials connected with the transaction of the county business. The character of the design adopted by Mr. Littler, of Manchester, the architect, is a modification of the style prevailing in the reigns of Elizabeth and of James I., and partaking rather of that known as Jacobean than that of the earlier period. The external facings of the walls are of red pressed bricks, with stone string-courses, cornice, window quoins, mullions, and other dressings. On the stone shields are carved the royal arms, the arms of the Duchy, and those of the House of Lancaster. The whole block has a frontage to Fishergate of 180 ft., and to Pitt-street of 184 ft., inclusive of care-taker's house and intervening gateway to court-yard.

In order to utilise to the greatest advantage the area of ground afforded by the site, an open inner court is formed, around two sides of which the offices and other apartments are grouped. The walls of the court are lined with glazed white bricks. A central corridor on each floor gives access to the various rooms and offices, which face the public thoroughfares.

The ground-floor, which is 4 ft. or 5 ft. above the street level in Fishergate, is occupied by the Clerk of the Peace and his staff; and on this floor there are two staircases and two entrances. The principal entrance is from Fishergate, and the first glance of the interior gives the impression that the work is in every respect worthy of the county. Facing the entrance is a long corridor leading to the various offices, the record-room (which is fireproof), and the dining-hall. On the right is the porter's room and the office of the second Deputy Clerk of the Peace; and on the left the office of the Clerk of the Peace, and the Deputy Clerk of the Peace. On the opposite side of the same passage is a room occupied by the clerk to the Clerk of the Peace, and a large general clerks' office. All these rooms are elegantly and substantially furnished. We next pass the way down to the basement, which is lined with white glazed bricks, specially made. In the long corridor, on the right, are the lavatory, the court crier's room, and two rooms occupied by solicitors, who are assistants to the Clerk of the Peace. On the left hand are the library, the stationery-room, and large record-room for the Clerk of the Peace.

We next ascend the grand staircase, with tiled walls and wrought-iron balustrade, to the first floor. Here are found similar suites of rooms to those below, which are occupied by officials connected with the financial business of the county. The county treasurer's office is a handsome room, and adjoining it is that of his chief clerk. The next office is that of the county auditor, and on the opposite side are commodious rooms for his clerks. At the end of the passage is a door leading to the constabulary department. The room allotted to the second clerk to the county treasurer is the most handsome one in the building as regards fittings, and no little ingenuity has been displayed in the compactness and convenience of its arrangements. The joiners' work is of pitch pine, most carefully selected, and the markings of the wood are of extreme beauty. Such choice specimens of pitch pine (French polished) as have been used in all the fittings throughout the building are rarely seen; and a timber merchant speaking in reference to the room in question

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where there was a good opportunity for the display of workmanship, said, in expressing his admiration, "The man who has done this deserves to be knighted." Passing down the corridor, on the left, are rooms for clerks to the county treasurer and auditor, and the record-room connected with their departments. On the right is the committee-room, with ante-room and lavatories. At the end of the corridor we reach the large hall, or court-room, for the county magistrates, in which they meet for the transaction of the county business. Here the decorators have had an opportunity for the display of their ability. A pamphlet has been prepared by Mr. C. R. Jacson, J.P., the most active of the county magistrates, descriptive of this room, and the picture-subjects, heraldic devices, badges, and mottoes on the walls and windows. The dimensions of the county sessions hall are 62 ft. by 45 ft., and it is 36 ft. high, with an open-timber roof in character with the style of architecture of the building. It is lighted by a lantern-light in the roof, and by large windows with semicircular heads, having stone mullions and transoms, glazed with head-lights of suitable design. In connexion with the court is a retiring-room for magistrates, an entrance, and a platform for the public. The court-room fittings are all of pitch pine, darkened to harmonise with the walls; and accommodation is provided for about 200 magistrates, in addition to the county officials and reporters to the newspapers. One of the staircases already mentioned is continued up to the second floor, or attic story, in which additional office room and store rooms are provided.

Descending from the court-room we reach the luncheon or dining room on the ground floor, which is wainscoted with pitch-pine. Every panel in the framing is a specimen of well-marked wood.

The court-room, corridors, and offices are warmed by hot-water pipes, in addition to open fireplaces in the principal rooms, the apparatus in use being that of Messrs. Metcalf & Dilworth, of Preston. The offices are all connected by speaking-tubes, and by telephone to distant parts of the town, so that the officials can communicate with each other, and in any direction, without leaving their rooms. Hydrants are provided on the staircases and corridors, and extincteurs are at hand for the purpose of extinguishing fire. The floors of the corridors and record-rooms are carried on brick arches, and the floors laid with marble concrete of a grey tone.

In the basement are the kitchens, scullery, hoists, stores, hot-water apparatus, and strong-room for the deposit of valuable parchment records. Along the corridors are rooms in which the county registers, election papers, ballot-boxes, &c., are kept for each division of the county. There are rooms for the storage of plans which have to be deposited with the Clerk of the Peace, and documents which are least required for reference. One or two minor officials,—such as the bridge-master and the cattle-plague officer, have quarters in the basement.

Mr. John Walmsley, of Preston, has been the general contractor for the erection of the building; and Messrs. David Tullis & Son have done the masons' work, as sub-contractors under Mr. Walmsley. The County Hall has been decorated by Messrs. Shrigley & Hunt, of London and Lancaster, under the supervision of Mr. Hunt, from designs by Mr. E. H. Jowitt and Mr. J. Milner Allen, of London, who have executed the same. The furniture has been made by Messrs. Bell & Coupland, of Preston; and the whole work is done in a satisfactory way, and reflects credit upon the contractor.

The entire cost of the building and site (constabulary offices included) has been 58,000*l.*

Previously to the erection of this block of buildings, which is within two or three minutes' walk of the railway station, the various public offices were scattered, and documents were stowed away in boxes, cupboards, and drawers, some at one place and some at another, wherever room could be found for them; and the magistrates had to meet at the Court House, more than a mile away. All are now brought together under one roof, which is a great convenience, not only to the officials, but to the general public who may have county business to transact.

To the foregoing general description of the buildings we add some particulars of the decorations. Generally speaking, the scheme of decoration is as follows:—An attempt has been made to illustrate the history of the county in its relation to the national history by means of picture subjects, portraits, heraldic devices, badges, and mottoes, and to indicate the chief use of the hall by appropriate inscriptions. The history of the county palatine is interwoven with the history of England from the earliest period. The legends of the county are found amongst those which appertain to the country at large. The pictorial subjects represented in the semicircular heads of the panels are as follow:—South wall.—Combat between Sir Tarquin and Sir Lancelot du Lac, the Roman Castle of Manchester in the distance. According to Roby, Sir Thomas Mallory, and other writers, these two knights were resident in Lancashire (the one near Manchester, the the other near Martin Mere). The shields flanking this subject are, dexter, King Arthur; sinister, King Edmund the Martyr, 2. Alfred dividing the kingdom into shires, hundreds, and tithings,—dexter shield, Alfred the Great; sinister, Edward the Confessor. 3. William I. granting what is now Lancashire to Roger de Poictu (so called from his having married Alwood Poictu), the great Baron of Lancashire, as a reward for the services rendered by his family to the Conqueror,—dexter shield, William I.; sinister, Roger de Poictu. 4. John granting Magna Charta,—dexter, King John; sinister, Simon de Montfort. West wall.—5. Marriage of Henry VII. and Elizabeth; union of the houses of York and Lancaster,—dexter shield, Henry VII.; sinister, Elizabeth of York. 6. Crowning of Henry VII. on the field of Bosworth,—dexter, Queen Elizabeth; sinister, the Duchy of Lancaster. North Wall.—7. James I. at Hoghton Tower,—dexter shield, Tyldesley; sinister, Hoghton of Hoghton, created baronet, 1611. 8. The Defence of Lathom House,—dexter shield, Charles I.; sinister, Stanley—Lathom. Heraldry:—South wall, in panels (below the historical subjects).—King John, *Comte sans terre*, made Earl of Lancaster by Richard Cœur de Lion; William Radcliffe, sheriff, A.D. 1194; George McCorquodale, present high sheriff; Henry III.; Edmund Crouchback; Edward I.; J. Wilson Patten (Baron Winmarleigh) and Sir Benjamin Heywood, the two last representatives of the entire county; Edward III.; Henry Grismond, first duke of Lancaster; Sir Henry de Haydok, chancellor of the first Duke of Lancaster. Westwall.—H. M. Victoria; John o' Gaunt; Richard II.; Henry IV., first monarch of the Lancastrian line. North wall.—Henry VII.; Elizabeth; Edward, Lord Stanley, first lord-lieutenant of the county; Molyneux, of Sefton; Gerard le Bryn. The side panels throughout the hall are filled by the rose of Lancaster. South wall.—Returning to the doorway leading to the magistrates' bench, we have portrait illustrations of some of those who by their enterprise, invention, perseverance, skill, and refinement, have contributed to the greatness, wealth, and happiness of the county. 1. Francis, 3rd duke of Bridgwater, representing Enterprise. 2. Sir Robert Peel, 1st. Bart., Commerce. 3. Sir Robert Arkwright, Kt., Manufactures. 4. Crompton, Invention. 5. Roscoe, Literature. 6. Whitaker, History. 7. Holker, Jurisprudence. 8. Romney (Fine Arts), from a portrait of the artist by himself, in the possession of John Romney, esq., of Whitestock Hall, Ulverston. The female heads in the picture represent a well-known favourite subject of the artist. 9. Whewell, Science. The hall roof, five panels in height, is decorated with the arms of the Duchy, with the addorsed Talbot supporters, the Lancashire rose crowned, and the motto "Dieu et mon Droit," in the upper and lower two panels, the central band having a blue field on which are the rose, thistle, and shamrock, with the national mottoes, "Dieu et mon Droit," "Nemo me impune lacessit," "Quis separabit." The panels of the lantern roof are devoted alternately to the feather, and the falcon and padlock badge of John o' Gaunt, and the feather entwined with a garter, with the motto "Sovereygne" of his royal son, Henry IV. In the windows are set forth the badges of all the English sovereigns from the Conquest to the present day, as follow:—South side: 1. Norman. 2. Plantagenet. West side: 3. Plantagenet. North side: 4. House of Lancaster, Henry IV. 5. House of Lancaster, continued. 6. House of York. 7. House of Tudor. East side: 8. House of Tudor. 9. House of Stuart. 10. House of Hanover. The east wall, below the spring line of the window-heads, is decorated with the arms of the four Quarter Sessional Boroughs of Manchester, Liverpool, Bolton, Wigan, which occupy the central spaces between the windows. The two outer spaces contain the principal boroughs (not already named) of the six Hundreds,—Lancaster, in the Hundred of Lonsdale; Preston, in the Hundred of Amounderness; Blackburn, in the Hundred of Blackburn; Chorley, in the Hundred of Leyland; Salford, in the Hundred of Salford; and Warrington, in the Hundred of West Derby. Above the window-heads the wall is diapered with the C.P.L. (County Palatine of Lancaster) alternating with the Lancastrian rose. The shields of the remaining boroughs are disposed upon the west wall and below the corbels on the north and south walls, and the remaining wall space is diapered upon a full green field with the initial letter "L" enseigned with the royal crown. Over the principal entrance of the court are the arms of the county carved in wood. The court is lighted by two gaseliers of wrought brass. It is intended to fill the staircase window with coats of arms, illustrative of the history of the County Palatine.

It was intended that the new County Sessions Hall should be opened on Thursday in the Guild week (7th inst.), by the Duke and Duchess of Albany; but, owing to the illness of the Duke, the ceremony has been postponed to Thursday next, the 14th inst., when the Earl of Derby will open the courts, and deliver the inaugural address, in his official capacity as chairman.

THE PRESENT SITUATION OF THE BUILDING INDUSTRY IN GERMANY.

THE Union of Master Builders (numbering 4,200 members) has presented a petition to the German Government on the subject of re-introduction of the test-examination for masters. It is urged that the present freedom of admission to the trade is doing injury to it, and is also prejudicial to the interests of the State and of the public at large. The petition goes on to explain that building is an industry which requires all possible assistance from science and art, and that the development of building has at all times been a proof of the general culture of a nation. Thus it is argued that it is unwise to allow persons completely devoid of scientific and technical knowledge to exercise a calling of this nature. It is remarked that the fact of unqualified persons being in the trade imposes upon the public unnecessary trouble and expense in guarding themselves against the dangers of giving work into incompetent hands.

In support of the scheme for a test-examination it is urged that the younger members of the trade are anxious to have a definite object in their studies, and are desirous of having their qualifications vouched for by competent authorities.

In conclusion, it is argued that the proposed restrictions on admission to the building trade are no more a violation of commercial liberty than are the tests which are usual in other callings, of which the unrestrained exercise by incompetent persons would be dangerous to the public safety, the analogous cases of apothecaries, sea-captains, pilots, &c., being brought forward in support of this view of the subject.

Fall of Buildings.—An accident that might have been attended by serious results occurred on the 30th ult. at the National School, Mellor, Blackburn, which is being rebuilt. It is stated that a gable had been run up very rapidly to the height of 20 ft. The heavy rains had kept the mortar soft, and some of the stonework fell. The men at work on a scaffold were precipitated to the ground, and one of them had a narrow escape. Two wallers, named Beattie and Mycrop, were injured, one having an ankle sprained and the other being cut about the head. On the same day a joiner named John Woods was working inside the Mason's Arms Vaults, Salford, when he narrowly escaped with his life from a heap of falling building material. The building was being demolished, and two men were engaged pulling down the fire-range on the ground-floor, whilst Woods was pulling up the floor-boards in the second story. They called out to Woods to come and assist them, and he replied, "In about a minute." Immediately they heard a crash, and rushed out of the building, which fell inwards. Woods was buried in the fallen ruins, and when extracted he was found to be suffering from injured ribs.

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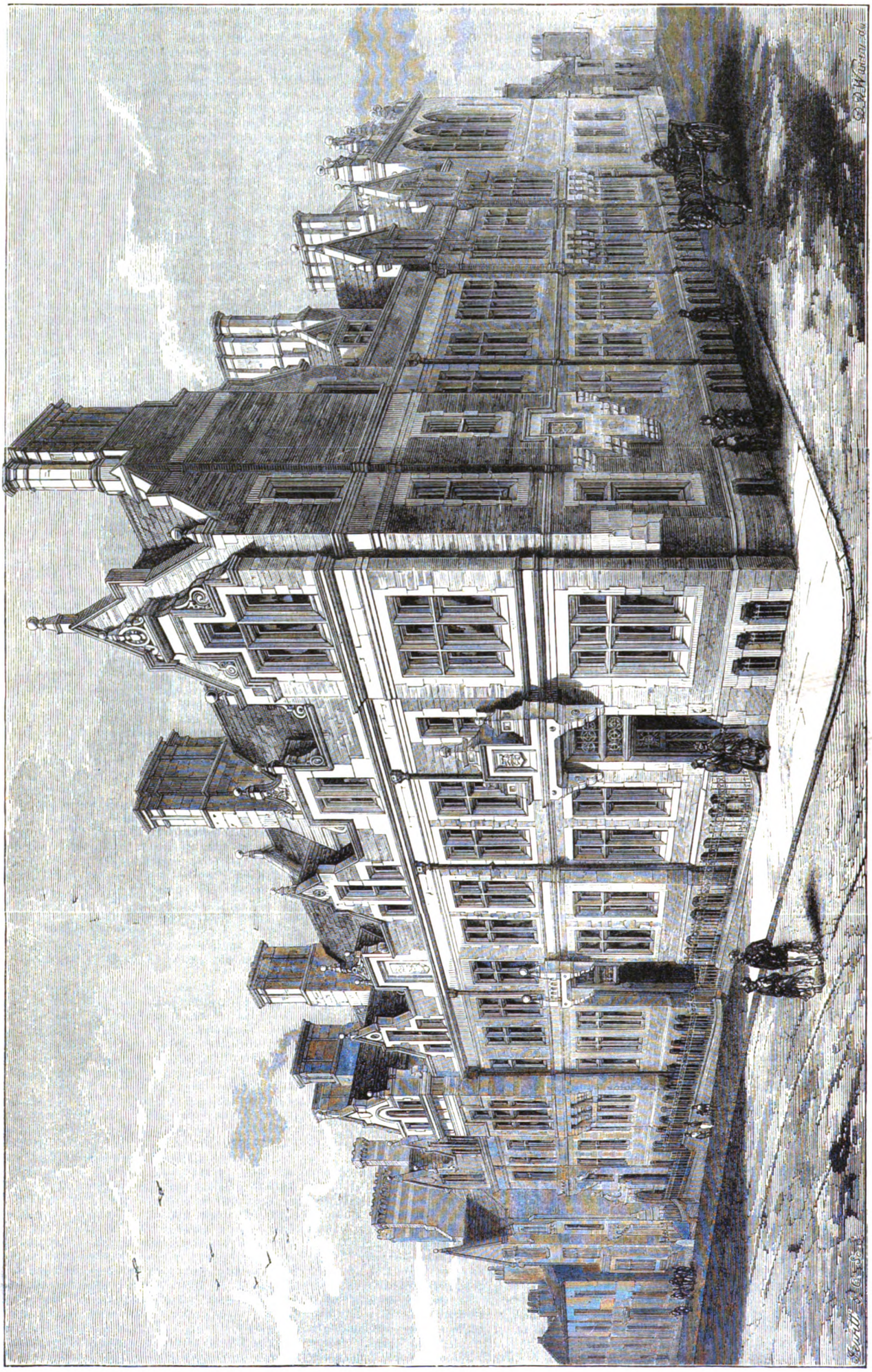

THE NEW COUNTY PUBLIC OFFICES, FISHERGATE, PRESTON.—MR. LITTLER, ARCHITECT.

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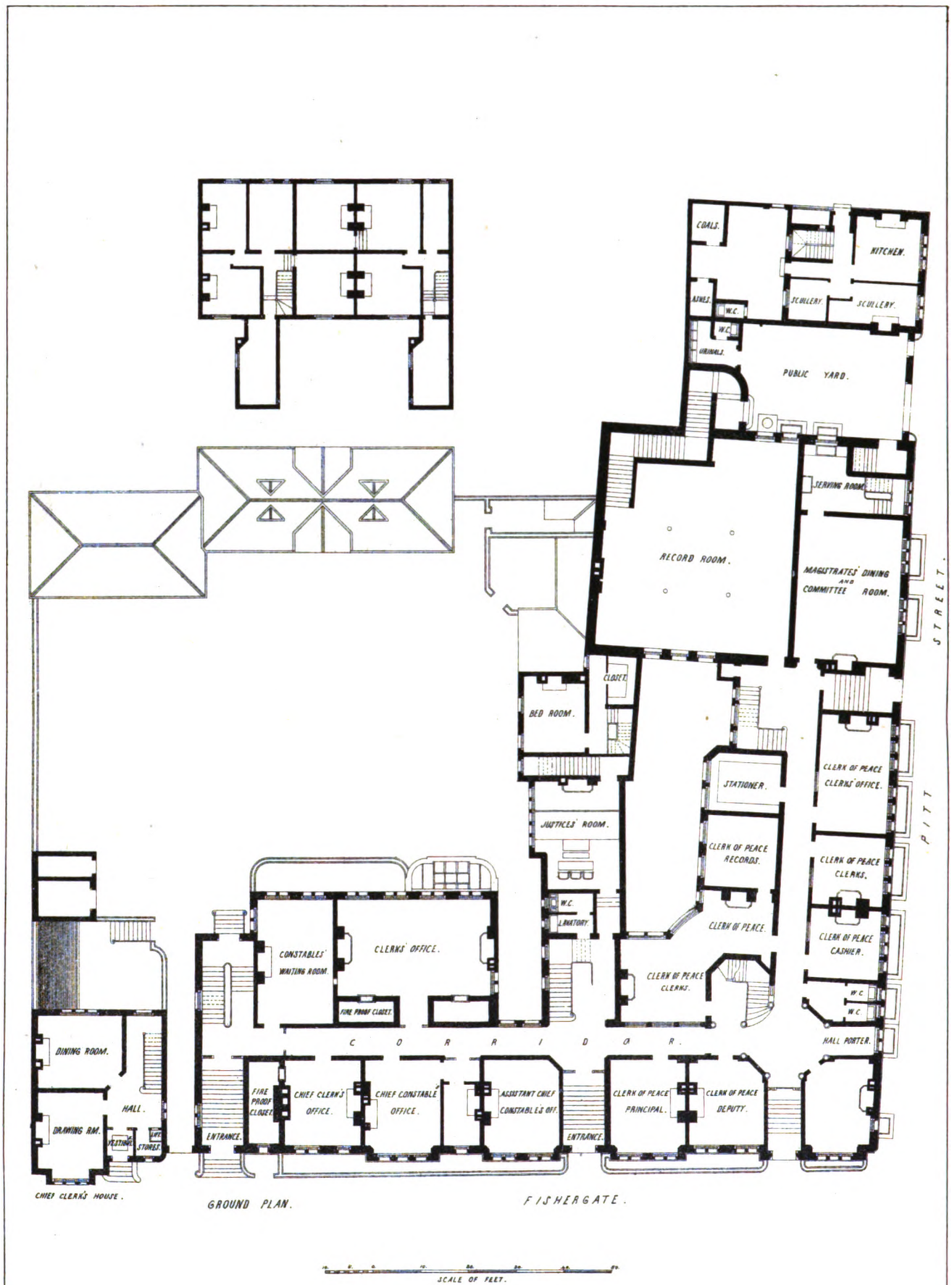

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THE COUNTY PUBLIC OFFICES, PRESTON.

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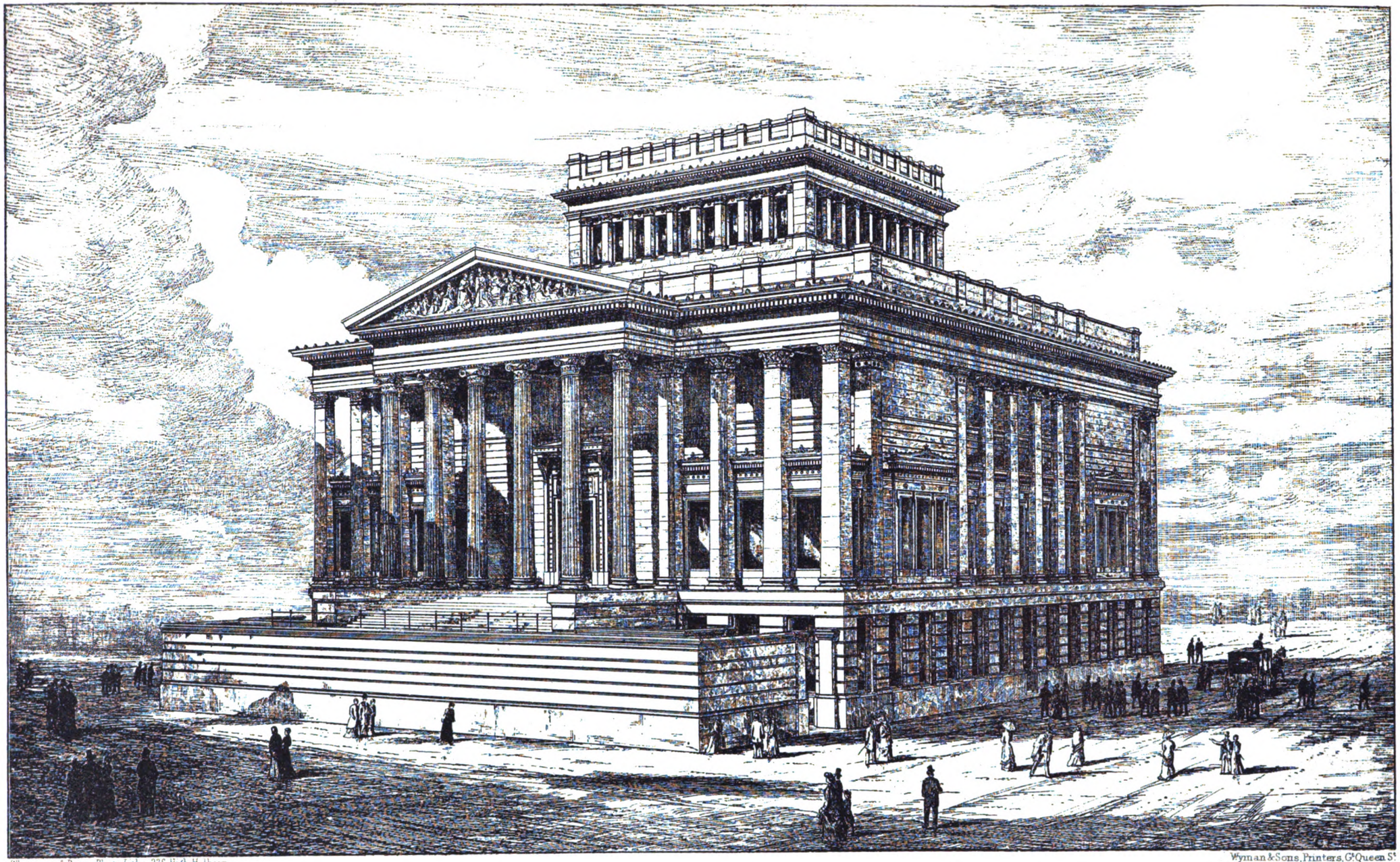

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THE HARRIS FREE PUBLIC LIBRARY AND MUSEUM, PRESTON.—Mr. James Hibbert, Architect.

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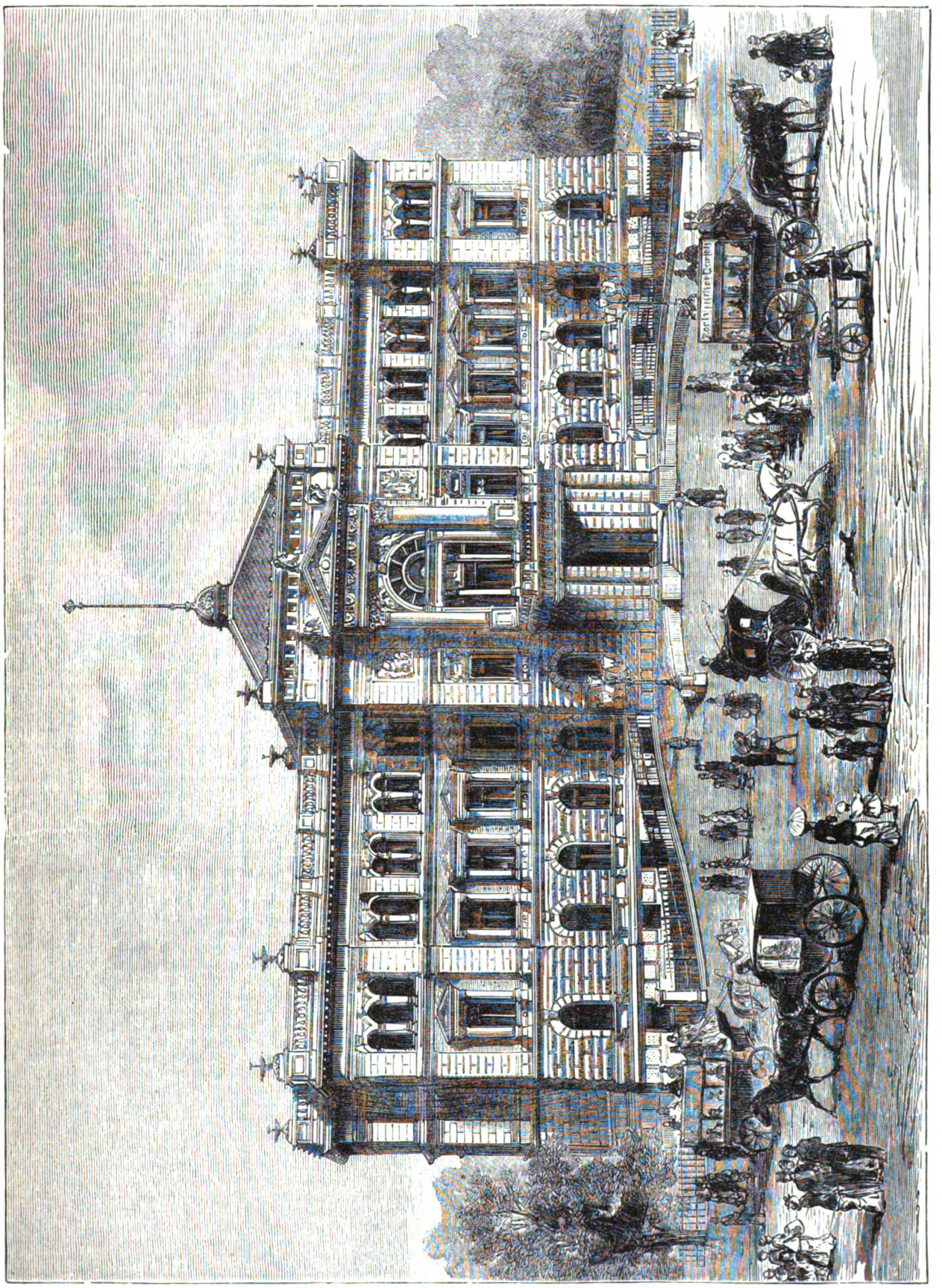

THE NEW PROVINCIAL ESTATES HOUSE, HANOVER.—HERR F. WALLBRECHT, ARCHITECT.

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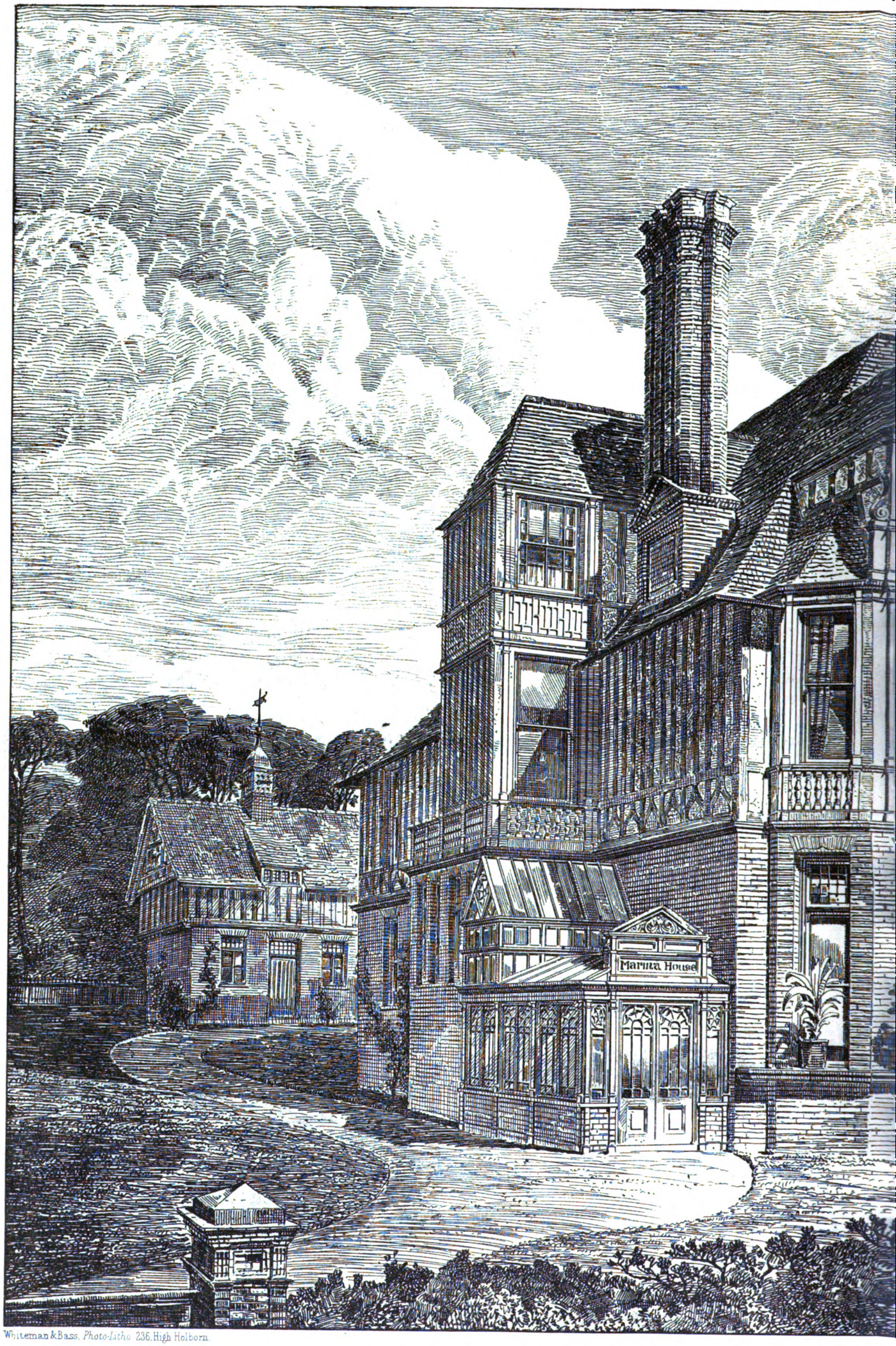

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MARINA HOUSE, WALMER, KENT.

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—Mr. James Neale, F.S.A., Architect.

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THE HARRIS FREE PUBLIC LIBRARY AND MUSEUM, PRESTON.

THE foundation-stone of this building was laid on Tuesday last by the Earl of Lathom, with Masonic honours. The ceremony was to have been performed by H.R.H. the Duke of Albany. We described the building at some length in a previous number,* and we now give a view of the proposed building and a plan of the principal floor. For convenience sake, it may be as well to repeat a portion of what we then said, with some further particulars.

The designs have been prepared by Mr. James Hibbert, who was commissioned by the Harris Trustees to visit several buildings of a similar character in this country and on the Continent, the result of Mr. Hibbert's visit and report being that he was appointed the architect to prepare the designs.

The building will be of the Greek Ionic order, and will have four distinct frontages, being completely isolated from the buildings around it. The principal elevation is on the west side, overlooking the market-place, and almost at right-angles with the north frontage of the town-hall. The height of the frontage to the parapet and the apex of the portico is 80 ft., and the extreme height to the top of the central lantern, 112 ft. The portico consists of six massive fluted columns, with bold capitals. It is surmounted by a bold overhanging cornice, and the tympanum is filled in with a group of figures representing Minerva surrounded by Literature, Science, and the Arts. The frontage is 130 ft. The bases of the columns of the portico and its floor level are about 10 ft. above the street level, and the entrance to the building is under the portico by flights of steps on the north and south sides. Immediately under the tympanum of the portico is the carved inscription in large characters,—"To Literature, Science, and Art." The eastern elevation of the building faces Lancaster-road, a fine thoroughfare about 60 ft. in width, leading out of Church-street, the principal street in the town. It is uniform in length with the Market-place frontage. The north and south frontages are each 170 ft. in length, and will face two new streets, each 50 ft. in width, which are about to be constructed in connexion with certain town improvements intended to be carried out simultaneously with the erection of the Free Library buildings.

The collection of models connected with the industrial arts will be placed on the ground-floor portion of the central hall, with the object of bringing them under the daily observation of visitors passing to and from the lending department and the adjacent reading-room and newsroom. The newsroom on the south side, and the reading-room on the north side, are each 29 ft. by 55 ft.; one of the lending libraries is 50 ft. square, and the other 55 ft. by 29 ft. The central hall is 54 ft. square, and is continued, by the staircase, on all the floors, being lighted by the lantern immediately over a central well. The principal floor contains the reference libraries, on each side of the central hall. They are each 30 ft. in width, and 120 ft. in length. The central hall portion of the principal floor will be set apart as a museum of casts and reproductions from the antique. On the principal floor there is also a conversation-room, and a room for chess and draughts. The whole of the upper floor will be devoted to museum and fine-art purposes. The museum galleries are arranged round three sides of the central hall and staircase, one side being devoted to the fine arts, the corresponding side to natural history and physics, and the remaining side between these to the department of general archæology, ceramics, and the finer kinds of industrial art, and illustrations of ethnology.

Adopting the statement of the architect, for the fine-art galleries time will be required to form a permanent collection that can be considered equal to the objects in view; but meanwhile much may be done in utilising them for exhibitions of the works of living artists and of loan collections. The pecuniary means, however, immediately at command would purchase, for instance, such examples as a complete series of the publications of the Arundel Society, consisting of fac-simile reproductions, in chromolithography and engraving, of paintings in fresco by the old Italian and German masters, which might be framed and placed in the galleries. An historical collection of engravings and etchings arranged in the order of the various schools and masters would equally be attainable. Autotypes, also, on a large scale, of famous paintings in the great European galleries, and characteristic works like the "Liber Studiorum" of Turner, are now procurable. Illustrative examples such as these, though not costly, are of greater interest, and certainly of higher value in educating the public taste than those mediocre specimens of the works of living artists which form the greater part of our annual exhibitions. Modern pictures, that is, those of living artists, can only be very sparingly bought with the endowment fund, and even those only need be purchased which exhibit the best elements of the school to which they belong.

The central hall and staircase are proposed to be devoted principally to works of sculpture after the antique and later schools, and may be rendered, in a degree, somewhat unique in a provincial town. The friezes and metopes of the Parthenon, of the Temple of Theseus at Athens, and the frieze of the Temple of Apollo Epicurius at Phigaleia in Arcadia, may not only be among the models presented of the best Greek art, but can be arranged so as to form the permanent architectonic decoration of these parts of the interior. Some of the finest works of Greek and Græco-Roman statuary, as well as of the later masters, in fac-simile reproductions, may be purchased out of the funds immediately available.

The architect justly observes:—"The character of the design is academical, conceivably the most appropriate. Influenced by studies of Ionian art, its chief features are simplicity and symmetry of plan, truthfulness of expression, and, in execution, refinement of detail. In the plastic arts, as in literature and geometrical science, the Hellenic race has reached the highest standard. If Greek architecture is to be retained in practical service, it is requisite, when opportunity affords, to present new combinations of its forms. For the purposes of a library and museum, — a repository of knowledge, of examples of the arts, and of specimens illustrative of the sciences,—its suitableness will be admitted. There are fashions in architecture, as in most artistic productions of the time. A structure, however, that is fit for its uses, subserves its distinctive functions, and is in harmony of expression with the nature and quality of those functions, stands above the fluctuations of ephemeral taste. Such, in this instance, is the object to be sought and endeavoured, as far as the building is concerned,—the production of a work of permanent value, an example of memorial art."

The design has received the approval of the Harris Trustees, and they have resolved to devote 70,000*l.* of the funds of their trust to its execution, with all the attendant expenses.

* See p. 285, *ante*.

MARINA HOUSE, WALMER, KENT.

WE illustrate another of the several houses which have been erected by Mr. Alexander Tod at Walmer, from the designs and under the personal superintendence of Mr. James Neale, F.S.A., of Bloomsbury-square, London.

The house is situated on the beach, and commands uninterrupted sea views, overlooking the Downs and the coast of France. When Mr. Todd purchased the land about a year ago there was on the site a small house, built with outside walls of a single brick in thickness, and cemented, but with a picturesque verandah. To this house it was only intended to build a wing. The wing was well advanced when it was decided to pull down the front of the house so as to get thicker walls and make the old elevation in keeping with the new. Eventually the whole was removed. The various changes somewhat governed the arrangements of the plan. The house is erected as shown on the drawing, excepting a slight change in the treatment of the dormer terminating the bay-window.

The principal story is raised some 6 ft. above the level of the ground, so as to take advantage of the sea views. This causes the basement story to be well out of the ground and thoroughly light.

The house is square on plan. It contains, in the basement, housekeeper's room, servants' hall, kitchen, pantries, larders, water-closets, &c. On the principal floor are five reception-rooms, butler's pantry, and bedroom. There are fifteen bed and dressing rooms, with ample bath-room and the necessary accommodation. The serving lobby of the dining-room is separated from the principal part of the house, and is supplied with a lift. The balcony-room is intended for billiards and smoking.

Especial care has been taken with the sanitary arrangements. Air is admitted into the halls, heated by Doulton's radiating stoves, and circulated through all the bed and sitting-rooms. The house is well fitted; there are water-closets and hot and cold water on each floor.

The verandah in the centre of the front o the house can be approached from either the drawing or dining rooms, and can in winter be glazed so as to give additional warmth to these rooms. The principal entrance of the house is through the glazed conservatory entrance at the side. This leads into a large central hall 31 ft. long by 13 ft. wide. The main staircase is enclosed within an arcading, and forms a picturesque feature.

The external walls are hollow, being faced with Teynham red bricks on the two lower stories. The timbering of the upper story is backed with brickwork one brick and a half in thickness; the timbers are painted a dark combed oak, and the panels filled with pebble dash, collected from the sea shore. The roof is boarded, felted, counter raftered, battened, and hung with Broseley tiles. The hip and valley tiles have been purposely made to range with the tile courses. The return angle tiles are also purposely made to overlap the fronts of the dormers, and thus prevent the wet penetrating between the timbers and the tiles. The whole of the basement is covered with a bed of concrete. No expense has been spared to make the house comfortable and weather-proof against the driving rains and east winds.

The building has been erected by day-work, excepting the following contracts:—Messrs. Taylor & Sons, of London, for the hot-water and bath apparatus; Mr. G. Harvey, for plastering; Mr. Bartlett, of Walmer, for plumbing; Messrs. Frost Brothers, of Deal, for gasfitting.

On the site of the trees shown on the drawing Mr. Tod is now erecting a large gabled house, which we may hereafter illustrate.

THE NEW PROVINCIAL ESTATES HOUSE, HANOVER.

ONE of the most striking new buildings of Hanover is the edifice which we illustrate in our present number, the house in which the estates of the province of Hanover meet. It was built in 1879 and 1880, from plans by the architect F. Wallbrecht. Its site is the crossing-point of the Schiffsgraben and the Sophienstrasse, in the axis of the latter, and forms for it a monumental *point de vue*. The building stands clear in the centre of garden grounds, and is of a rectangular form, 200 ft. long by 98 ft. deep, with projectures in the centres of the four façades. The edifice, of a light grey sandstone quarried at Nesselberg, near Springe (Hanover), Lauba brick being sparingly employed, is in the style of the Italian Renaissance. The ground-story is of freestone; the first story has broad windows framed by Doric columns and corresponding pediments; the second story forms an arcade gallery divided by pilasters. The centre portion of the principal front is adorned on the ground-floor by a wide carriage porch with balcony over it, and in the two upper stories by a large semicircular-headed window, flanked by columns and surmounted by an entablature and pediment. It is profusely decorated with figures in the spandrels over the semicircular-headed window, and with reliefs at the sides. The former, representing History and Poesy, were executed by the sculptors Narten and Dopmeyer, of Hanover. The relief to the left, by Professor Engelhardt, of Hanover, shows Trade and Agriculture under the protection of Hannovera; that to the right, by the sculptor Hartzer, of Berlin, Arts and Sciences under the ægis of Germania. The frieze is adorned with the arms of the seven counties (Landschaften) of Hanover,—Hildesheim, Bremen-Verden, Lüneburg, Kalenberg, Göttingen-Grubenhagen, Hoya-Diepenholz, Osnabruck-Ostfriesland.

The interior execution agrees with the exterior, the principal decoration being concentrated in the centre portion. From a vestibule, the groined vaulting of which is supported by columns of Swedish granite of a reddish colour, the walls being of yellowish stucco marble, the staircase with three flights is reached. The latter, which

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reaches through the three stories, is lighted by a large skylight in painted glass, and closed by a surbased vault with ogives. Rich ornamentation, coats of arms, and frescoes adorn the staircase, which in the upper stories opens into arcade galleries, by which access is gained in the first floor to the lobby of the "house," in the second floor to the strangers' gallery. The principal meeting-room of the above-mentioned "house" has a height of 36 ft., is 58 ft. long, and 33 ft. broad, and has sitting-room for seventy-nine deputies, the marshal and the president of the province, and the councillors of the exchequer. The hall is lighted from above and from side windows placed high up; its walls are of a sober hue, but enlivened by the coats of arms of the counties and chief cities of the province of Hanover. The principal hall and the lobby are heated by hot air, and connected with a retiring-room for the chief officers of the house, and a cloak-room for the deputies. The rooms to the right and left of the principal hall include, in the first story, another smaller hall, committee-rooms, and official residences. In the second story are the library, committee-rooms, and offices.

The total cost of the building, including the price of the site and the expenses attaching to laying out the grounds, was 75,000*l.*

THE FUTURE OF LIGHTING AND HEATING.

FROM the admirably practical and perspicuous address delivered by Dr. C. W. Siemens, F.R.S., as President of the British Association for the Advancement of Science, and upon which we offered some comments last week (see p. 295, *ante*), we extract the following passages:—

The advantages of the electric light and of the distribution of power by electricity have lately been recognised by the British Government, who have just passed a Bill through Parliament to facilitate the establishment of electrical conductors in towns, subject to certain regulating clauses to protect the interests of the public and of local authorities. Assuming the cost of electric light to be practically the same as that of gas, the preference for one or other will in each application be decided upon grounds of relative convenience; but I venture to think that gas-lighting will hold its own as the poor man's friend. Gas is an institution of the utmost value to the artisan; it requires hardly any attention, is supplied upon regulated terms, and gives, with what should be a cheerful light, a genial warmth, which often saves the lighting of a fire. The time is, moreover, not far distant, I venture to think, when both rich and poor will largely resort to gas as the most convenient, the cleanest, and the cheapest of heating agents, and when raw coal will be seen only at the colliery or the gasworks. In all cases where the town to be supplied is within, say, thirty miles of the colliery, the gasworks may, with advantage, be planted at the mouth, or still better at the bottom, of the pit, whereby all haulage of fuel would be avoided, and the gas, in its ascent from the bottom of the colliery, would acquire an onward pressure sufficient probably to impel it to its destination. The possibility of transporting combustible gas through pipes for such a distance has been proved at Pittsburg, where natural gas from the oil district is used in large quantities. The *quasi* monopoly so long enjoyed by gas companies has had the inevitable effect of checking progress. The gas being supplied by meter, it has been seemingly to the advantage of the companies to give merely the prescribed illuminating power, and to discourage the invention of economical burners, in order that the consumption might reach a maximum. The application of gas for heating purposes has not been encouraged, and is still made difficult in consequence of the objectionable practice of reducing the pressure in the mains during daytime to the lowest possible point consistent with prevention of atmospheric indraught. The introduction of the electric light has convinced gas managers and directors that such a policy is no longer tenable, but must give way to one of technical progress; new processes for cheapening the production and increasing the purity and illuminating power of gas are being fully discussed before the Gas Institute; and improved burners, rivalling the electric light in brilliancy, greet our eyes as we pass along our principal thoroughfares. Regarding the importance of the gas supply as it exists at present, we find from a Government return that the capital invested in gasworks in England, other than those of local authorities, amounts to 30,000,000*l.*; in these, 4,281,048 tons of coal are converted annually, producing 43,000,000,000 cubic feet of gas, and about 2,800,000 tons of coke; whereas the total amount of coal annually converted in the United Kingdom may be estimated at 9,000,000 tons, and the by-products therefrom at 500,000 tons of tar, 1,000,000 tons of ammonia liquor, and 4,000,000 tons of coke, according to the returns kindly furnished me by the managers of many of the gasworks and corporations. To these may be added, say, 120,000 tons of sulphur, which up to the present time is a waste product. Previously to the year 1856,—that is to say, before Mr. W. H. Perkin had invented his practical process, based chiefly upon the theoretical investigations of Hoffman, regarding the coal-tar bases and the chemical constitution of indigo,—the value of coal-tar in London was scarcely a halfpenny a gallon, and in country places gas-makers were glad to give it away. Up to that time the coal-tar industry had consisted chiefly in separating the tar by distillation into naphtha, creosote, oils, and pitch. A few distillers, however, made small quantities of benzine, which had been first shown,—by Mansfield, in 1849,—to exist in coal-tar naphtha mixed with toluene, cumene, &c. The discovery, in 1856, of the mauve or aniline purple gave a great impetus to the coal-tar trade, inasmuch as it necessitated the separation of large quantities of benzine, or a mixture of benzine and toluene, from the naphtha. The trade was further increased by the discovery of the magenta or resaniline dye, which required the same products for its preparation. In the meantime carbolic acid was gradually introduced into commerce, chiefly as a disinfectant, but also for the production of colouring matter. The colour industry utilises even now practically all the benzine, a large proportion of the solvent naphtha, all the anthracene, and a portion of the naphthaline resulting from the distillation of coal tar; and the value of the colouring matter thus produced is estimated by Mr. Perkin at 3,350,000*l.* The demand for ammonia may be taken as unlimited, on account of its high agricultural value as a manure; and, considering the failing supply of guano and the growing necessity for stimulating the fertility of our soil, an increased production of ammonia may be regarded as a matter of national importance, for the supply of which we have to look almost exclusively to our gasworks. The present production of 1,000,000 tons of liquor yields 95,000 tons of sulphate of ammonia, which, taken at 20*l.* 10s. a ton, represents an annual value of 1,947,000*l.* The total annual value of the gasworks by-products may be estimated as follows: Colouring matter, 3,350,000*l.*; sulphate of ammonia, 1,947,000*l.*; pitch (325,000 tons), 365,000*l.*; creosote (25,000,000 gallons), 208,000*l.*; crude carbolic acid, (1,000,000 gallons), 100,000*l.*; gas coke, 4,000,000 tons (after allowing 2,000,000 tons consumption in working the retorts), at 12s., 2,400,000*l.*,—total, 8,370,000*l.* Taking the coal used, 9,000,000 tons, at 12s., equal 5,400,000*l.*, it follows that the by-products exceed in value the coal used by very nearly 3,000,000*l.* In using raw coal for heating purposes these valuable products are not only absolutely lost to us, but in their stead we are favoured with those semi-gaseous by-products in the atmosphere too well known to the denizens of London and other large towns as smoke. Professor Roberts has calculated that the soot in the pall hanging over London on a winter's day amounts to fifty tons, and that the carbonic oxide, a poisonous compound, resulting from the imperfect combustion of coal, may be taken as at least five times that amount. Mr. Aitken has shown, moreover, in an interesting paper communicated to the Royal Society of Edinburgh last year, that the fine dust resulting from the imperfect combustion of coal is mainly instrumental in the formation of fog, each particle of solid matter attracting to itself aqueous vapour; these globules of fog are rendered particularly tenacious and disagreeable by the presence of tar vapour, another result of imperfect combustion of raw fuel, which might be turned to much better account at the dye-works. The hurtful influence of smoke upon public health, the great personal discomfort to which it gives rise, and the vast expense it indirectly causes through the destruction of our monuments, pictures, furniture, and apparel, are now being recognised, as is evinced by the success of recent Smoke Abatement Exhibitions. The most effectual remedy would result from a general recognition of the fact that wherever smoke is produced fuel is being consumed wastefully, and that all our calorific effects, from the largest furnace down to the domestic fire, can be realised as completely and more economically, without allowing any of the fuel employed to reach the atmosphere unburnt. This most desirable result may be effected by the use of gas for all heating purposes, with or without the addition of coke or anthracite.

THE NEW PUBLIC HALL, PRESTON.

THE new Public Hall at Preston, formerly known as the Corn Exchange, was opened on Monday last. The alteration and enlargement of the Corn Exchange, from the designs of Mr. B. Sykes, of Preston, will cost the Corporation between 10,000*l.* and 11,000*l.*, which is more than was originally estimated to be the cost. The increase is owing to certain additional structural arrangements, which, as the work has progressed, were found to be absolutely necessary, if the idea originally entertained of making the building one of the largest and finest in the county was to be carried out. The aim has been to utilise to the utmost the space at disposal for the accommodation of the public, without in any way depreciating the effect of vastness and the unity of architectural design, and Mr. Sykes has (according to the *Preston Guardian*) succeeded in forming the interior into a lofty and imposing auditorium, commanding from every seat an unobstructed view of the orchestra. The new public hall exceeds the dimensions of the Free Trade Hall in Manchester. The measurement of the Free Trade Hall is 133 ft. by 77 ft., or 10,241 square feet; the Philharmonic measures 135 ft. by 102 ft., or 13,770 square feet; and the dimensions of the new Public Hall in Preston are 147 ft. by 95 ft., or 13,965 square feet. Applying the standard regulating the total capacity of the Free Trade Hall and other large buildings of a 1 ft. 6 in. and 1 ft. 9 in. sitting accommodation for each person, the Public Hall will hold 3,564 persons, accommodation being distributed as follows:—Front seats, 524; back seats and under galleries, 1,433; galleries, 807; standing-room being left for 800 persons. The orchestra, which is not included in this calculation, is constructed to hold 250 performers. The main entrance to the hall is from Lune-street, through a tiled vestibule, with a glazed screen. A large crush-room is then entered, to which are attached retiring-rooms for ladies and gentlemen. Passing through a vestibule containing stairs, the floor is reached, which measures 145 ft. by 95 ft., including that portion occupied by the orchestra. The floor is constructed of pitch-pine. The orchestra, which is situated at the other end of the building, in front of the main entrance, is approached from the front on each side by staircases for the band, and from the rear by two doorways for the chorus. The seats, eight rows in depth, are arranged in a semicircular form and in tiers, the front seats for the band being on a level plane. All the steps are movable, so that a clear stage can at any time be presented when the hall is used for public meetings or theatrical performances. In the centre at the rear is the organ, which occupies a chamber measuring 24 ft. by 20 ft. There is a handsome proscenium flanked by bold pillars, with ornamental caps and entablature. The gallery is surmounted by eighteen arches, nine on each side, each having a span from pillar to pillar of 14 ft. It is supported by iron columns and strong pilasters against the walls, which relieve the old walls of the entire weight of the structure. The keystones of the arches are ornamental, with carved blocks and spandrels, and curved ribs in the cove, enriched with ornamental work, and Classic in design. The broad gallery runs round three sides of the building, and has two entrances at the north and two at the south side, and from every seat a good view of the orchestra can be obtained. Beneath the gallery there is a mezzanine floor, and on each side of the gallery there are corridors 7 ft. wide, which connect the assembly-room with the retiring-rooms and waiting-rooms behind the orchestra. Connected with these places there is a large supper-room, measuring 42 ft. by 36 ft., and which communicates with a kitchen in the basement by means of a lift. There is also in the

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basement storage room for the hall seats, cooking accommodation, and all the necessary appliances. A pitch-pine staircase has been constructed, in order that there may be direct communication between the floor of the area and the supper room. The height of the building from floor to ceiling is 45 ft. The method of lighting and ventilation is admirable. A series of circular windows of ribbed, reflecting glass, specially made for the purpose, have been fitted into the ceiling. The ceiling is dome shaped, with good wall space. For ventilation, three of Strode's ventilators, 4 ft. 6 in. in diameter, and six, 3 ft. 6 in. in diameter, have been fitted up. The heating arrangements have been carried out by Messrs. Metcalf & Dilworth, hot-water engineers, of Preston. The building can be illuminated by means of three large sunlights, with 127 jets in each. The hall has a very light and cheerful appearance, the decorations being in a quiet key, and in harmony with the ceiling, the plaster work of which is white through its whole extent. The pillars are painted in light drab, and the caps relieved with gold. The front of the gallery and the cornice is coloured in greens and chocolates of various tones, which harmonise with the general light scheme of colour pervading the upper portion of the building, and it is only underneath the gallery, on the bases of the pillars, that darker tints are used. The walls underneath the gallery, and of the retiring-rooms, have a dado 4 ft. high, of a chocolate colour, with ornamental border, the other portions being of a creamy tint. The whole of the works have been undertaken by Mr. Robt. Saul, builder, of Preston. The furnishing of the hall and the whole of the interior were entrusted to Messrs. Bell & Coupland.

MEETING OF THE INTERNATIONAL SANITARY CONGRESS, GENEVA.

THE few delegates who, in prudence, came to Geneva a little before date, will have found the time hang heavily on their hands. The principal secretary, Dr. P. L. Dunant, has displayed unceasing activity, and, if he escapes the strain without serious consequences, it will speak well for the vigour of his constitution; but other secretaries, without whose assistance the work became almost impossible, ominously fell ill at the last moment. None of the offices for the congress were, therefore, opened before the 3rd September; that is, on the eve of the commencement of the congress. Further, the Sanitary Exhibition, which should have been ready to receive the public on the 1st of September, remains closed, and admission cannot be obtained before the 4th, and even then the exhibits will be found still in a very confused condition. The organisers of the congress are, however, in no wise to blame for this *contretemps*. The building was not given up to them by the authorities till a fortnight after the date promised. In spite of these little drawbacks,—which, indeed, are characteristic of nearly all congresses,—the meeting promises to be a great success. Names and subscriptions have already been received from no less than 400 adherents, and most of the Governments of Europe have sent special delegates. We have already met Dr. H. Napia and M. Durand Claye, delegates of the Paris Municipal Council; Dr. Louis de Csatary, delegate of the Hungarian Government; and Señors Cabello, Montejo, and Vilanueva, delegates of the Spanish Sanitary Society, and the Ministries of War, Marine, and Interior; Dr. Hausser, from the Municipality of Seville; and Dr. da Silva-Amado, from Portugal. These sanitary reformers from the Peninsula for the most part frequent the Hôtel Métropol, the largest hotel of Geneva, and its vast drawing-rooms, staircases studded with divans, supply facilities for lounging and talking highly appreciated by the members of the congress, who have each a special scheme to discuss or system to propagate.

Armed with a special permission, we penetrated the sanitary exhibition, and, clambering over packing-cases, gained a fair view of the display. Practically, it bears the character of a French exhibition, and, being French, it is essentially Parisian. The City of Paris is so far the principal exhibitor that it has printed and issued a special catalogue of its own, independently of the general catalogue. Certainly such a measure is of service, and, to those who are not yet familar with Parisian administrative matters, this section will prove of very great interest; while every one will be pleased to note how elegantly, even artistically, are arranged objects that might be considered anything but attractive. Thus there is a trophy of all the brooms, scrapers, spades, &c., used to clean the streets and sewers of Paris, which is so well grouped that it looks absolutely ornamental. Close at hand are all the instruments used at the Observatory at Montsouris for the analysis of the air of Paris. Splendid drawings describe the water supply of Paris, the aqueducts of the Vanne, the Dhuis, and the Canal de l'Ourcq; every system of tap and hydrant; and, finally, a full-size model of a section of a house, showing how the water is distributed and the mysteries of the plumber's work. Under the sink, the pipe is straight; there is no trap or syphon; and this, as a representation of what is done in Paris, is correct enough. But, outside the house, a disconnexion is established by allowing the 1-in. lead pipe to flow into the mouth of a 4-in. junction to the rain-water spout. Unfortunately, this is so far from being the general practice in Paris that, though we have visited many houses, we do not remember one instance where any such disconnexion was attempted.

Warming and ventilation as practised in Paris are admirably represented by models and drawings of the Hôtel Dieu, the new Hôtel de Ville, where Messrs. Geneste & Herscher's system of ventilation has been adopted, and of various other hospitals, public buildings, &c. Sections of all the Paris sewers, models of the *tinettes filtres*, for retaining solid matter while the liquid is allowed to go to the sewer, are shown, together with the entire plans of the irrigation farm at Gennevilliers. Under the latter are specimens of gigantic vegetables grown by the aid of the Paris sewage. But all English observers, possessing even only a slight technical knowledge of such subjects, will be surprised, not to say scandalised, by a huge double picture illustrating the disadvantages of cesspools as compared to sewers. The first half of the picture represents, in a very graphic and telling manner, the interior of a house while a cesspool is being emptied. From the garret to the people walking in the streets every one is seeking to escape from the foul odour. Certainly this rendering of a domestic inconvenience which all Parisians have experienced is familiar and effective. The second half represents the same persons, in the same house, quietly enjoying the evening without experiencing any inconvenience. It also shows that the cesspool has been abolished, and the closets, &c., placed in direct connexion with the sewer. As a means of popularising a generally approved principle, this picture might have been of service; but, as it stands, it is, on the contrary, a triumphant demonstration of the superiority of cesspools over sewers in a country where such profound ignorance of house-drainage still prevails. According to the model in question, instead of improving matters, sewer gas has been laid on throughout the house. It will scarcely be credited that there is not a single precaution taken to prevent the entrance into the house of gas from the public sewer. The drain-pipe ceases under the seat of the highest closet; it is not carried up to the roof for ventilation. It communicates by junctions with all the other closets on each floor, and none of these closets have any traps. It is only when the pipe, passing underneath the house, approaches the public sewer that a bend will be found; but no means whatsoever are shown of ventilating the pipe, or of ventilating the public sewer into which the pipe falls. The house is thus utterly unprotected, and under such circumstances the old cesspool, with all its inconveniences, would be far preferable. It is astonishing that the municipality of Paris should have allowed this drawing, replete with every imperfection, to be presented as a model, and on such an occasion!

Among the private exhibits will be noted some very beautiful drawings of M. Émile Trélat's system of unilateral light for schoolrooms, &c., which, at one glance, explain his system. These clearly show how windows can be managed so as to let the light come all from the same direction, thus avoiding the cross lights which distract and distress the eyes, and yet having equal and sufficient illuminating power over each desk or seat. On the opposite side M. Trélat also places windows, but these are shut during class time by venetians or wooden shutters, which, while admitting air, exclude light; thus the "unilateral" light is maintained. When once, however, the lessons are over and the class-room vacated then the shutters are removed and the light admitted from both sides, but this only for the purpose of purification, for the purpose of giving the schoolroom a bath of sun, air, and light.

Some drawings explanatory of the Geneva system of drainage will surprise many English critics. Geneva admits the principle of draining into the sewer, but it still maintains its old cesspools. These, however, are placed in direct communication with the sewer, and to prevent the nuisance of emptying the cesspools or the danger of accumulations, water is turned on at great pressure by means of stop-cocks accessible in the street, and the cesspools are thus periodically flushed. The violent inrush of the water stirs up the heavy matter, and it flows away into the sewer which has its outfall into the Rhone at a point some distance below the town. It is difficult to understand why the cesspools should have been maintained, when once it was determined to admit all matter into the sewer. Also the cost of carrying a pipe across the cesspool to the sewer would have not amounted to the sum now expended in periodical flushing of the cesspools. The dangers that may arise from bringing the water-pipes into the cesspools might also be avoided. In any case, if the inhabitants of Geneva are so tenacious for the preservation of their antiquated cesspools, we would respectfully suggest that these should in future be utilised as intercepting chambers for the purpose of ventilation and of breaking the connexion between the house and the sewer.

Such are a few among the more striking features of the Sanitary Exhibition. There are, of course, numerous health charts, statistical reports of all description, ambulance displays, patent foods, school furniture, chairs for invalids, &c., and, doubtless, many new inventions will be on view in a few days, when the preparations are all complete.

We have every promise of a busy week. Apart from the meetings of the five sections every morning, and the general meetings in the afternoon, every evening is also taken up. On Monday evening an official reception will be held. Tuesday evening Professor A. de Candolle receives the members at his country mansion of the Vallon. On Wednesday there is a similar reception at the hydrotherapic establishment of Champel-sur-Arve; while on Thursday the Swiss Government places the steamer *Mont Blanc* at the disposal of the congress. The water-cure establishment of Evian will be visited, and lunch taken at the establishment; then the steamer, crossing the lake, will take the members of the congress to a banquet offered them by the municipality of Montreux at the Kursaal. On Friday there is a reception at the mansion of Madame Eynard, and finally there is a farewell banquet on Saturday.

In spite of all these attractions, we are sorry to note, in conclusion, that the number of English members present is still very limited.

THE CIRCULATION OF UNDERGROUND WATERS.

IN the Geological Section of the British Association meeting at Southampton,

Mr. C. E. De Rance read the report of a committee appointed for the purpose of investigating the circulation of the underground waters in the permeable formations of England, and the quality and quantity of the water supplied to various towns and districts from those formations, to which was added an appendix, written by Mr. Edward Wethered, on the density and porosity of rocks in relation to the water supply, in which the author set out by averring that a knowledge of the porosity of rocks was important as regarded the water supply, the suitability of stone for building purposes, and in accounting for some of the lithological changes often observed in the earth's strata. Though the matter had not escaped investigation, the vast volume of water stored in the rocks had not been fully realised. The density of the old red sandstone was 2·61, the volume of water absorbed by a cubic foot being over 0·707 gallon, and by a square mile, 3 ft. thick, 59,000,000 gallons. The conglomerate beds of the same formation were still more absorbent, being capable of taking in 0·805 per cubic foot, or 67,000,000 gallons to

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a square mile, 3 ft. thick. The mill-stone grit which lay at the base of the coal measures varied much in different localities, that found in the Forest of Dean being the most porous, absorbing 66,000,000 gallons to the square mile, 3 ft. thick. Some of the coal-measure grits also stored large volumes of water. The Pennant rock, about 900 ft. thick, in the Bristol coalfield, and extensively developed in Somersetshire, as also around Swansea, was capable of absorbing 12,000,000 gallons in a square mile, 3 ft. thick; and specimens of magnesian limestone taken from the neighbourhood of Bristol, showed a porosity of 86,000,000 gallons, but the carboniferous limestone was quite the reverse, and only absorbed 3,500,000 gallons. Oolites held vast stores of water, and the rock was much used for building. Mr. Wethered then referred to the relation of specific gravity to porosity, and proceeded to say that shallow well-water had been classed by the Rivers Pollution Commissioners as dangerous, and the deep as wholesome, and there must, therefore, be a purifying process going on during the percolation into the earth. From an analysis of rocks, it was clear that nothing in the chemical composition of the rock could purify the water, and in order to get rid of organic contamination there must be oxidation, and they must, therefore, look to another source for the oxidising agent, which, he thought, existed in the air absorbed by the water, and in the air contained in the interstices of the rock.

DISCOLORATION OF "SOUTHAMPTON WATER":

IS IT DUE TO SEWAGE?

IN the Section devoted to Biology (Department of Zoology and Botany), British Association meeting, Southampton,

Mr. Arthur Angell, F.I.C., the County Analyst, read a paper on the brown coloration of "Southampton Water." The writer showed that the peculiar colour of the Southampton estuarine water, which turns to a rusty brown tint in the summer of each year, is due solely to the presence of a small ciliated organism, *Peredinium fuscum*, which is classified by the best authorities amongst the ciliated protozoa, or microscopic animals. This position is generally accepted, but Mr. Angell, seeing that they evolve oxygen, contain chlorophyll, — plant colour matter,—have no mouth or opening of any kind, never contain foreign bodies, have cellulose walls, and, after death, give off an odour of decaying seaweed, is of opinion that they are more plants than animals. He further sought to show that their presence is due to the large amount of sewage thrown into the river at and about Southampton. The seaward margin of the river water is distinctly mapped out by the brown colour, and the author noticed that this never leaves the estuarine basin, and pointed out that a measurement of the oscillations of this line provides a true index of the tidal motions, and shows that the water in the river is but very slowly, if at all, changed by the rise and fall of the tides. He showed it was an error to suppose that in tidal rivers and land-locked estuaries a fresh supply of water is given at every tide, and that as a matter of fact the time needed in which a single change in such waters as Southampton Water will take place is dependent more upon the small flow of fresh water and surface evaporation than upon tidal influences. It is not, therefore, safe to pollute tidal waters with sewage; the impression that the filth goes out to sea with the tide is utterly false. The peculiar brown colour gives us an indication by which we can learn that practically a change of the water of the Southampton Water, and therefore of all other similarly situated tidal-river mouths and land-locked estuarine basins, is but very slowly, if ever, effected by the tides. Enough filth is poured into the river to make it in hot weather a stinking abomination, but in accordance with nature's provisions against such unnatural proceedings, a vast army of minute organisms is set to work and the water is kept tolerably sweet. If it can be shown that this creature, which is barely visible to the naked eye, performs the chief functions of plants,—liberates oxygen, and is at the same time an animal and therefore carries on direct nitrification, it is indeed most wonderfully adapted, by this double set of powers, to keep our sewage-polluted waters as sweet as is possible. Notwithstanding the unsightly colour of *Peredinium fuscum*, we cannot afford to do without it in our river. When the day comes that the authorities of Southampton see fit to keep out the sewage now flowing into its waters so as to free them from such vile pollution, the *Peredinium fuscum*, no longer needed in such vast quantities, will retire into its normal position, become less obtrusive, and leave the water a pure translucent green.

The paper was illustrated by three views showing the enlarged representations of the organism, Mr. Angell adding there was a most wonderful likeness in all the specimens. He had seen them in the Southampton Water in countless millions for years, and had never seen the slightest difference in them, nor had he known an instance of self-division or conjugation, and was perfectly in the dark as to whence the organism comes and whither it goes.

Professor Lawson, M.A. (president of the Department) said the colour of the water which Mr. Angell had described he at first imagined was due to innumerable diatomaceæ of a certain kind which they all knew were exceedingly abundant in estuarial waters; in fact, it was where fresh water and salt water met that it was most abundant. The *Peredinium fuscum* was a creature which, of course, was thoroughly well known, and it made its appearance in large quantities, and he thought it was to that, to a large extent, though not entirely, that the discoloration of the water might be due.

Mr. Shore, jun., said he was sure the members were obliged to Mr. Angell for his interesting paper. As to the nature of the organism, that should be left an open question to be worked out during the resting stage, and when the process of conjugation and division had been watched.

Mr. Angell said the difference of opinion which had been alluded to as to the exact nature of the organism was likely to exist for some considerable time, but he thought they were drifting into circumstances when all would have to admit that no hard and fast line could be drawn between a plant organism and an animal organism. These organisms, however, seemed to him to indicate a remarkable instance of the adaptability of Nature to circumstances, the organism being marvellously well adapted for the double purpose it had to perform. He had a bottle of water taken that morning, but it was not a good specimen of the discoloration; for westerly winds such as were then being experienced affected the colour, but in calm quiet days, the water was quite as thick as good hot brown coffee.

THE VYRNWY (LIVERPOOL) WATER SCHEME.

THE report of Mr. G. F. Deacon, Water Engineer to the Corporation of Liverpool, on the progress of the Vyrnwy works up to the 30th of June last, has just been issued. Mr. Deacon states that the embankment about to be constructed across the valley of the Vyrnwy will impound the upper waters of that river, and will form, for the supply of Liverpool, a lake at an elevation of 825 ft. above the sea level, having an area of 1,115 acres. The length of the embankment from rock to rock at the water level will be about 1,255 ft.; its height above the original river-bed to the ordinary top water level about 84 ft., and to the parapet wall of the roadway to be carried on arches along the embankment about 98 ft. It will be formed of rubble masonry set in Portland cement mortar, and will be founded wholly upon sound rock of the Caradoc beds in the lower silurian formation. This rock extends across the valley and up both sides thereof. The greatest depth of its surface below the river bed, within the area to be built upon, is about 55 ft. Before the works were commenced the rock in that part of the valley across which the masonry embankment is to be constructed, was covered with glacial drift, containing boulders of five or six tons weight, and blocks of rock of forty or fifty tons dislodged by glacial action. Above this drift lay an alluvial deposit, the result of silting up by the rock *débris* and *detritus* brought down by the many streams which feed the present river. In times of heavy rain the river Vyrnwy flooded the whole width of the valley, at the site of the intended embankment. Before commencing the present excavations the river was diverted from the left bank of the valley, where the rock is at a considerable depth below the surface, to the right bank, where it is close to the surface, and the new channel was made of sufficient capacity to pass the highest floods. This work had been completed when the memorial-stone was laid on the 14th of July of last year. Since that time the excavation to the rock has proceeded rapidly. The building of the masonry embankment will be commenced on the rock foundation to the north of the diverted river. The stone for this purpose is being obtained by quarrying at a point in the Cynon Valley about a mile and a quarter distant from the site of the embankment. The rock is of the same nature as that forming the foundation, and the dip of the strata is such that the stone may be obtained at very moderate cost. A tunnel is being constructed from the intended lake to the Hirnant Valley. It will form the first part of the aqueduct. Its length will be two miles 473 yards, and it will be of sufficient size to pass the whole of the water of the three instalments of 13,000,000 gallons a day each.

CEMENT, "VULCAN," AND ASPHALTE FLOORS.

A RECENT issue of the *Baugewerkszeitung* contains a communication by Herr Walter Lange on some results obtained by him in the use of cement, a material called "Vulcan," and asphalte for floors in wet and highly-heated rooms. In the extensive rebuilding of the starch manufactory of Herr E. Hoffmann at Salzuflen (near Minden), burnt down some time ago, about 30,000 square yards of flooring had to be laid down. The various uses to which those floors would be put necessitated the employment of various materials. If to this fact it be added that a portion of the floors had to be taken into use as soon as ever practicable, it may well be believed that it was not a very easy matter to make a selection at once as to the proper material to be employed. Experiments had on former occasions been made with different materials, all of which had been unsuccessful. It was especially found that the wear and tear of the floors in the starch factory was very great, owing to the employment of three-wheeled trollies (on the average loaded with 20 cwt. to 30 cwt.), the rapid deterioration of the floors being further accelerated by the fact that they are generally in a very wet or highly heated state.

It was at first intended to use a layer of cement on a concrete bottom for all the rooms (stone slabs could not be employed for the greater part of the rooms on account of the joints), and this was partly laid down when it was found that it would not answer. As above stated, sufficient time had not been allowed for hardening, and then the floors were used at once to such an extent that the cement was broken up in an incredibly short time by the three-wheeled trollies. The front wheel, in turning, leans over on one side, and cuts the upper skin of the cement; and if this was once effected, there was no chance of saving the rest, for the lower layer had not yet attained that hardness which would resist pressure. Water on the cut and bruised surface completed the destruction, for, being forced on to the floors at high pressure, even pebbles in the floor were washed out.

Two methods were employed at Salzuflen for laying down cement floors. Upon a fresh bed of concrete, a layer consisting of cement and sand in equal parts, and from 2 to 3 centimètres thick, was put, well rammed down, levelled, and then smoothed with a hand iron. This proceeding, compared with the other, has several disadvantages. The second method consists of mixing a concrete of one part of cement, two parts of sand, and four parts of gravel, laying it down, and ramming it until a layer from 1 to 2 centimètres thick appears on the surface without any gravel. This layer is then levelled and smoothed down. Floors prepared by the latter method are much more durable, and resist pressure much better than those laid down by the former. The thickness of the concrete floors depends very much upon the extent to which they will be used, and the resistance of the soil to be covered. If sufficient time is left for the cement floor to harden, —and the longer it is left the better,—it will resist for a very long time any ordinary pressure.

In the drying-rooms of the above starch manufactory, cement floors were also laid down;

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but they proved efficient only after having been put down in first-rate style, and left to bind and harden for a sufficient length of time (from four to six weeks). But should they be intended to be used before that time, and subjected early to a high temperature (about 40° C.), it is highly advisable to desist from using cement. In the latter case, a kind of floor is to be recommended which is at present very little known, and is described by the inventor, Herr Oelzner, Ingenieur, of Hagen, Westphalia, as "Vulcan" floor. The mass is poured upon prepared beds to a thickness of 4 centimètres to 6 centimètres, and costs from 3 marks to 3½ marks per square mètre (about 4d. a square foot). The "Vulcan" floors are prepared in the following manner. The surface is covered with stone chips, ashes, &c., the height of this bed depending upon their later use. The mass, the composition of which is Herr Oelzner's secret, is made liquid, and poured upon the bed. The liquid mass penetrates the cracks and pores of the rubble, and forms, after solidifying, a hard slab. After having somewhat settled, the mass is beaten with a wooden pestle, and smoothed. This operation is repeated as long as the floor sweats after each beating. The floor is smoothed down after each beating. Amongst the advantages claimed for the "Vulcan" floor is its great solidity, which it assumes, however, only after some time. But the hardening of the floor takes place even at a great heat (in the drying-rooms at Salzuflen, hardening is effected at a continuous temperature of 50° C.). Finally, it must be noted that the floor is proof even against strong acids. Experiments have been made by Herr Lange in which the mass in a powdered state was submitted to the action of concentrated sulphuric acid; the only effect of which treatment was that the mass dissolved and then hardened. Herr Lange likewise observed that old pieces of this floor, after having been immersed for some time in concentrated soda lye, remained perfectly intact. The only drawback is that hardening takes place so very slowly. On the other hand, the mass becomes so hard as even to blunt steel chisels very rapidly. Herr Oelzner's "Vulcan" floors have been very successful elsewhere, even in establishments where very heavy iron castings or forgings are moved over them. Herr Lange says respecting the composition of Oelzner's "Vulcan" mass it appears to him that it contains a large proportion of blast-furnace slag, and that residuums of sulphuric acid manufacture and the so-called *caput mortuum* (colcothar) are also used in it.

For such rooms as were already in use, it was found necessary to resort to asphalte. The asphalte, from the Limmer pits, was so-called casting asphalte (*asphalte coulé*). It was melted in the usual way, mixed with gravel, laid on, and smoothed down with wooden spattles. Concrete of cement, sand, and gravel served as a bed. In some rooms cement and asphalte layers were used together, asphalte being put down in the passages, concrete in the less used parts; a very sharp edge being indispensable for the joints. Of course, asphalte was employed in rooms with wet floors; but it is not suitable in rooms where acids are used, because asphalte peels off in course of time under the influence of acids.

It may be finally added that in Oelzner's starch manufactory several tanks had to be constructed for the reception of acids, the selection of the inner coating causing some difficulties. Cement, if exposed to the direct action of acids, is at once destroyed; asphalte shares the same fate, although not quite so rapidly. It was, therefore, proposed to employ a plaster of cement with a coating of zeïdeïolithe, a material consisting of nearly equal parts of sulphur and powdered glass and a trifling addition of graphite. This composition is absolutely acid-proof, but inflammable. Its preparation, moreover, and the laying-on, caused so many difficulties that the use of zeïdeïolithe was given up at the last hour. It was determined to employ stone slabs, filling up the joints with sulphur, a treatment or procedure which has been found efficient in sulphuric acid manufactories. Of course, it is understood that the stone slabs used must be acid-proof, and have been tested in that direction.

The Town Council of Oldham has passed a resolution in favour of the construction of the proposed ship-canal between Manchester and Liverpool.

THE NETHERFIELD GYPSUM WORKS.

MANY of our readers will remember that when certain scientific diggings were being carried on in East Sussex, between 1872 and 1877, although the undertakers missed a coal-mine they fell upon a mass of pure white crystalline gypsum,—alabaster. A company was formed, and has been at work for some time. An interesting account of the present condition of the works has been given recently by the *Sussex Advertiser*, and many of our readers will be glad to read a portion of it:—

The situation of the Subwealden Gypsum Works is remarkable for natural beauty. The mine is situated in a valley green with forest-wood, in the midst of the mountain district bounding the "the Garden of England." Battle, with its interesting old abbey, is only a few miles distant. The Ashburnham woods are close at hand. Normanhurst, with its spire-crowned walls, towers conspicuously on an eminence in the vicinity. In the wide green forest, rich with a natural flora, the visitor might fancy himself far removed from the habitations of men. Wild strawberries tempt his lips every few steps, wild foxglove blossoms around in rare exuberance. Were it not for the railway-siding and a tramway (1¼ mile long) threading its way through the underwood of ash, oak, and chestnut, to effect a communication with the South Eastern main line, the poetry of the "greenwood tree" would be unbroken. Historically and archæologically the spot is not without interest. The railings of St. Paul's, lately removed, were cast in the neighbourhood. The last cannon made of Sussex iron was likewise cast only a few miles off; and, in 1863, a most interesting find was discovered in a field close by, consisting of solid gold ornaments, which must have belonged to a king or Druid of the Celtic period. The ignorant finder sold the invaluable relic for the paltry sum of 6s. 6d., taking it for brass, and the purchaser was Vandal enough to consign it to the melting-pot, for which,—having defrauded the Crown of its dues,—he was deservedly punished.

A chimney rising high above the trees indicates the site of the gypsum works, and serves as a land-mark around. The works are situated directly over the mine from which the raw material is extracted. The seam now worked is of comparative thickness, and lies some 160 ft. or 170 ft. under the surface. One of the three stationary engines,—of collectively about 130 horse-power,—raises the cage, the descent of which is regulated by a brake. A visit to the subterranean regions is rendered comparatively easy. There is little water to contend with, and the headings may be traversed dryshod. The gypsum occurs in places in beautiful crystalline forms. The headings are high enough for a tall man to pass along without much inconvenience. At the present depth four headings are being worked. But the shaft has been sunk lower down, and there are headings ready for working in the lower seam. The rock has, of course, to be blasted with gunpowder. To drill the holes Mr. Finlay, whose practical genius is everywhere apparent, uses augers of considerable length, wound in a spiral twist throughout. These augers, worked by hand, are so contrived as to stop automatically when striking upon a hard stone. In the gypsum they will drive 5 ft. in half an hour or less. But for an occasional whiff of gunpowder, the air below is pure. When blasted, the rock is broken up with pick and wedge, and conveyed in trollies to the shaft. The trollies are raised in a cage to about 20 ft. above the surface, stopped on a platform and made to slide down an inclined plane, on rails, to the place where the mineral is sorted and picked. Every piece is examined before use, and, if necessary, any admixture of clay is removed with a hammer. The principal uses to which gypsum is put are conversion into plaster of Paris and cement. The less pure stone is burnt, to serve as a valued manure. Gypsum blocks are also sold in their natural state to brewers, who dissolve them in the water about to be converted into beer. For brewing purposes no ingredient is more valuable than gypsum, to which mineral the Burton water stands indebted for its world-renowned excellent qualities. Fine pieces of gypsum are also sometimes polished as marble for use indoors. Out of doors gypsum is not serviceable, as being soluble in water. Moreover, it may interest smokers to learn that gypsum is frequently used for a very fair imitation of meerschaum. Indeed, all the cheaper meerschaum pipes and cigar-holders are reported to be made of this adulterated article, which is prepared by polishing hardened plaster, tinting it with a solution of gamboge and dragon's blood, and treating it afterwards with melted paraffin or stearic acid. This process is, however, not practised at Netherfield.

The blocks intended to be made into plaster, having been examined and sorted, are broken up by machinery and then placed in the kilns. There are five kilns for this purpose at Netherfield. The flame is not allowed to touch the mineral, but is carried up to the chimney in flues. The object aimed at is simply the evaporation of the water of combination. The crude gypsum contains about 25 per cent. of water. By desiccation this is reduced to 7½ per cent. Evaporation begins at 175 degrees, and is best effected at a temperature of 230 or 250 degrees. Overheating, say up to 480 degrees or more, spoils the gypsum by making rehydration difficult or altogether impracticable. The kilns at Netherfield hold 10 tons or 12 tons each. Twenty-four or twenty-six hours suffice for drying one kilnful. Being desiccated, the pieces are taken out and tested if sufficiently dried. If they are not, they are put into the kiln a second time. After drying, the gypsum is ground on horizontal stones, having first been "cracked." After that it is sifted, which is really the principal operation in the whole process. All depends upon this. The Sub-Wealden Company have an excellent apparatus for sifting, the construction of which is, however, a trade secret. When sifted the plaster is filled into bags, and stored to cool for ten or twelve days, and then it is ready for use. Plaster, we may mention, is often "hardened" by an admixture of carbonate of lime or gum-arabic, which makes it capable of taking, under further treatment of smoothing and polishing with oil, a marble-like surface.

Gypsum intended for cement,—to be used for internal plaster-work in houses, cornice-mouldings, and the like,—has to be burnt by direct contact with the fire. There are different kinds of cement, three of which are manufactured at Netherfield,—namely, Keene's, Parian, and Martin's. The original manipulation of the blocks is the same in all cases. Keene's cement is made by treating the burnt gypsum with one part of alum to twelve parts of water, at a temperature of about 95 degrees. Having stood three hours, the material is rebaked in the furnace, and then thoroughly ground and powdered. When so treated it requires less water, sets more slowly, and acquires a tenacity half as great again as that of ordinary cement. Parian cement is ordinary plaster hardened with water, containing 10 per cent. of borax, and afterwards rebaked and ground. Stucco is plaster prepared with a strong solution of glue. The blocks intended for cement, of whatever kind, are burnt to red-heat in a kiln set apart for the purpose,—which takes about thirty-four hours,—and afterwards ground and sifted the same as plaster-gypsum.

Netherfield gypsum picked for plaster or cement has, as a rule, a proportion of about 95 per cent. of the pure sulphate. Its advantage, as compared with other English cement, is its freedom from marl and iron, and accordingly from the unsightly red colour caused by these impurities.

A HINT TO HASTINGS.

THE urgent want in Hastings (among other wants) of a small fishery pier and shelter harbour, to which we directed attention recently, was forcibly illustrated during the heavy gale of last week, which passed over Hastings and St. Leonard's, doing damage to the extent of between 2,000*l.* and 3,000*l.* to the fishermen's quarters. The roadway is almost completely destroyed, and several boat-houses along the beach roadway washed away. Large quantities of nets and gear have been lost, but, fortunately for the poor fishermen, their boats have escaped. The cost, however, of replacing what has been lost will amount to a large sum, and it often spells bankruptcy to a poor boat-owner, and enforces idleness on many of the men assisting in working the fishing craft. Surely, after the present warning, the Hastings authorities ought to bestir themselves in constructing a permanent and efficient roadway along under the East Cliff, and providing a small harbour and pier for the fishermen. We would also again remind

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the magnates of Hastings that a better system of groyne work and embanking is needed than what has been hitherto adopted. The life and death interest of the dwellers in, and the bread-winners of, the old town should not be so often and so systematically subordinated to the importunate and ever-administered-to calls of the fashionable new town. As towns and cities grow from their foundations, they have ever afterwards to be more or less dependent upon them. As it is with towns and houses, so it is with men. What revulsion of feeling is caused by seeing men and women richly attired, or with showy head-dress, while their feet below are ill shod. If Hastings does not wish to cultivate this analogy, and present a glaring exhibition of it, she had better bestir herself at once by manifesting an earnest activity in providing for the wants of the inhabitants of the older quarters of the historic Cinque Port.

THE GUILD-MERCHANT PROCESSIONS AT PRESTON.

REPRESENTATIVES OF THE BUILDING TRADES.

MONDAY last being "the Monday next after the Feast of the Decollation of St. John the Baptist," the week's celebration of the ancient Guild Merchant festivities was commenced at Preston. It is believed that the custom of holding the Guild Merchant dates back to early Saxon periods, but the first recorded Preston Guild was held in 1329, when Aubert, son of Robert, was mayor. Twenty-three guilds are recorded as having been held since then, and for the past 380 years they have been celebrated regularly every twenty years with quaint ceremony and great festivities. Although successive changes in the forms of local government have deprived the freemen of their ancient privileges, or, rather, removed the necessity for them, the Guild Merchant of to-day, while chiefly a round of festivities, has some features in common with those of centuries ago. It is still a means of bringing together members of the various trades, though not exactly for protective purposes, as was the case in days of old. Since the Guild Merchant began to change its character it has been a notable fact that each succeeding guild has surpassed its predecessors in magnitude of celebration. So it has been with that of 1882, which will turn out to be the most resplendent of all, largely on account of the anticipated though unfortunately abandoned visit of H.R.H. the Duke of Albany to lay the foundation-stone of the Harris Free Library. Triumphal arches span the principal thoroughfares, and many of them bear inscriptions welcoming the Duke and Duchess of Albany,—an incongruity which could not be avoided under the circumstances. In addition to these decorations most places of business are decked with bunting, and the old-fashioned aristocratic town presents a gay and festive appearance. Messrs. J. Defries & Sons, of Houndsditch, were entrusted with the decorations of some of the leading thoroughfares. The streets were lined with Venetian masts, on which were displayed trophies and festoons of flags.

The Amalgamated Trades' procession which paraded the principal streets of "Proud Preston" on Wednesday last included the following representatives of the building trades:—

Stonemasons.—Banner of the society from Manchester. Number in procession, 250, wearing wash-leather aprons trimmed with blue silk. Exhibits:—Lurry 1, flower-vases, finished and unfinished; lurry 2, building-stone in process of dressing, and dressed; lurry 3, the operation of stone-laying.

Ironfounders and Range-makers.—Two lurries, exhibited by Mr. Booth, Derby-street. On one, marble masons and marble polishers were at work; and on the other, range-founders and black and white smiths.

Plumbers and Painters.—The men, numbering 350, wore aprons emblazoned with their trade coat of arms. Exhibits:—Several lurries, one illustrating the plumbing department, containing a model of the interior fittings of a well-appointed house; another, with a pump and fountain in operation; a third, with men at work on various kinds of painting, marbling, and writing; and a fourth decorated with ornamental wall-paper, illustrating the paperhanging branch.

Carpenters and Joiners.—Exhibits:—Lurry containing model of church, with men working; and one with model of a joiner's shop, with men engaged in various kinds of work.

Bricklayers.—About 80 took part. Men engaged turning arch on lurry; lurry with trade tools.

Brickmakers.—About 150 took part. There were three lurries, on which members of the trade showed the various processes of manufacturing bricks, including pressing and burning.

Paviors and Flaggers.—These were the Corporation *employés*. Exhibits:—Model street, designed by Mr. Duthie, 18 ft. long by 7 ft. 6 in. wide, and arranged on the scale of 2 in. to 1 ft.; the footwalks thus representing a width of 12 ft. each, and the carriage-road, 45 ft. The road was paved with stones procured from quarries in England, Ireland, Scotland, and Wales. The borders of the platform were decorated with the royal and borough arms. The weight of the model was about three tons and a half, and was drawn by four of the finest horses belonging to the Corporation, on the largest lurry belonging to the London and North-Western Railway Company. Three apprentices, mounted on the leading horses, carried the Royal Standard. About 80 took part.

Plasterers.—Number, about 180, each man wearing an apron bearing the coat of arms of the craft.

This procession was preceded by one illustrative of the textile industries of the town.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

4,074. D. Jouls, Walton. Heating baths of dwelling-houses, &c. Aug. 25, 1882.

4,077. J. F. Wright and G. E. Wright, Birmingham. Gas stoves. Aug. 25, 1882.

4,090. W. Thornburn, Boroughbridge. Appliances for heating and warming. Aug. 26, 1882.

4,112. W. M. Brown, London. Baths. (Com. by W. W. Rosenfield, New York, U.S.A.) Aug. 29, 1882.

4,142. H. J. Haddan, London. Door locks. (Com. by O. Belger and F. Preller, Hanover.) Aug. 30, 1882.

4,153. E. Edwards, London. Carpet-fastener. (Com. by J. A. Wilmot, Riverside, New Brunswick.) Aug. 31, 1882.

4,165. W. R. Lake, London. Steam and hot water apparatus for supplying heat to dwelling-houses, &c. (Com. by E. F. Osborne, Saint Paul, U.S.A.) Aug. 31, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named:—

August 29, 1882.

1,458. L. A. Groth, London. Composition for rendering wood, &c., uninflammable. (Com. by H. R. P. Hosemann, Berlin.) March 27, 1882.

1,975. T. E. Bladon, Birmingham. Ventilators and chimney cowls. April 26, 1882.

2,015. G. Hurdle and W. Davie, Southampton. Opening and closing of window-sashes, &c. April 28, 1882.

2,080. W. Porter, Lee. Apparatus for testing cement, &c. May 2, 1882.

2,829. R. R. McKee, Kirkcaldy. Water supply and apparatus for flushing drains. June 15, 1882.

3,344. W. S. Laycock, Sheffield. Self-acting window-blind apparatus. July 14, 1882.

3,416. T. J. Baker, Newark. Chimney-tops or ventilators. July 18, 1882.

3,486. J. Leather, Liverpool. Ventilating apparatus. July 22, 1882.

Sept. 1, 1882.

3,371. H. A. Williams, Lincoln. Pulleys for window-blind rollers, &c. July 15, 1882.

ABRIDGMENTS OF SPECIFICATIONS.

Published during the Week ending Sept. 2, 1882.

324. H. M. Ashley, Knottingley. Kitchen-ranges. Jan. 23, 1882. Price 6d.

The bottom and sides of the oven are made of a waved form to allow of contraction and expansion. A sliding door is fitted between the fire and the chimney to send the draught under the oven when required. A passage is made below the hearth to allow air to pass to the bottom of the grate.

344. S. H. Bevan, Neath. Bonding roll roofing tiles. Jan. 24, 1882. Price 2d.

The tile is made approximately square, and the roll is carried up to the overlapping tile. (*Pro. Pro.*)

353. P. J. Davies, London. Water-closets, &c. Jan. 24, 1882. Price 2d.

Two syphons are so arranged that the water in the pan stands at a higher level than the water in the first syphon. (*Pro. Pro.*)

355. W. J. Doubleday, London. Bottom gratings or bars of fireplaces, &c. Jan. 24, 1882. Price 2d.

These are fitted in a frame so made as to be able to fall down and allow the ashes to slide off. (*Pro. Pro.*)

360. W. R. Lake, London. Supporting, balancing, and adjusting window-sashes. (Com. by P. W. Blythe, Boston, U.S.A.) Jan. 24, 1882. Price 6d.

A groove is made in the side of the sash, in which is fitted a tube. Inside this is a coiled spring, one end of which is fixed to the sash and the other to the frame. The dividing beads of the sashes are covered with indiarubber.

379. W. Wright, Plymouth. Flush-cisterns for water-closets, &c. Jan. 25, 1882. Price 6d.

A syphon is combined with a ball-valve and a starting-valve and passage. The cistern is filled by the ball-valve, and when the handle is pulled the starting-valve is opened. The rush of water that passes down the discharge-pipe draws with it the air contained in the syphon, and starts the syphonic action that empties the cistern.

413. B. L. Thompson, London. Protecting roofs, walls, &c. Jan. 27, 1882. Price 4d.

The roof or wall is covered with plates of iron or tin which are coated with vitreous material on both sides. Cloth or paper, &c., may be placed between plates and the roof or wall. The plates can be ornamented as required.

438. J. Imray, London. Manufacture of decorating paper. (Com. by A. Cottais, Paris.) Jan. 28, 1882. Price 4d.

The paper is prepared with a layer of fixed white made up with solution of gum arabic. The design, made with coloured fatty ink, is laid on this, and covered with insoluble varnish. Unsized paper is then glued on, and the first paper removed. The design is then applied to the wall, &c., and the unsized paper removed.

449. J. W. Brown, Leamington. Kitcheners or cooking ranges and cooking grates. Jan. 28, 1882. Price 2d.

The ovens are ventilated by perforations in the lower part of the door through which air passes into a box in which it is heated, thence to the oven, whence it escapes through a valve-box in the crown of the oven to the smoke-flue. (*Pro. Pro.*)

975. J. R. Nottingham, Washington, U.S.A. Composition for the manufacture of artificial stone. (Com. by A. Pelletier, Washington, U.S.A.) Feb. 28, 1882. Price 4d.

Cement or asphaltum is mixed with sand or broken stone, and an oxide and a chloride of any base or metal. These materials are well mixed together while hot.

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street.

RIGHT OF SUPPORT BY ADJOINING WALLS.

FEOFFEES OF ST. OLAVE, JEWRY, *v.* FINN AND METROPOLITAN BOARD OF WORKS.

THIS was a motion before Justice Day, sitting as Vacation judge, to restrain the removal of buildings and struts supporting flank walls. The plaintiffs were the owners of the Essex Tavern, and the defendants of the Bull's Head, in the neighbourhood of Houndsditch, and between them supporting struts had, it was stated, stood for forty years. A magistrate's order had been issued under the Metropolitan Building Act for the demolition of the walls of the Bull's Head as dangerous to the public. It had also become necessary to remove the structure, as the Board of Works were making a new street in the locality. The premises respectively were on the City boundary; but the Essex Tavern, being within it, was amenable to the jurisdiction of the Commissioners of Sewers, and could not be condemned until October next, when that body would again meet. On behalf of the plaintiffs it was argued that they had acquired an easement to the support the Essex had had from the other property; that the magistrate's order did not extend to the pulling down of the latter, but only to the making good of defective walls, to the satisfaction of a surveyor, and that whatever the defendants might do must be done without prejudice to the plaintiff's rights. On behalf of the defendants it was argued that they had no alternative but to obey the order which had been made against them.

Mr. Fischer, Q.C., appeared for the plaintiffs; Mr. Methold for the defendants.

His lordship could not possibly allow the defendants' house to be pulled down under the circumstances to the injury of the other, and therefore granted an interim order to restrain their doing so until the second motion day in November next.

Statue to the late Alexander Macdonald, M.P.—At the Miners' Conference held last week at Manchester, Mr. T. Burt, M.P., presiding, it was unanimously decided to entrust the execution of the above statue, which is to be of Sicilian marble, to Messrs. J. Whitehead & Sons, of Westminster, whose model was selected from amongst twenty-four in an open competition. The statue is to be 7 ft. in height, and will, when executed, be erected in front of the Miners' Hall, Durham.

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THE NEW MUNICIPAL BUILDINGS FOR GLASGOW.

EXHIBITION OF SKETCH DESIGNS.

THE exhibition of some of the sketch designs submitted in the preliminary competition for the Glasgow Municipal Buildings was opened on Saturday last, and will remain open until the 14th inst. The exhibition has been arranged by the Glasgow Institute of Architects, to whom the Town Council have given the use of the upper gallery in the Corporation Buildings in Sauchiehall-street. Screens have been erected, on which the designs are shown, and in this way, while the work of the architects is properly displayed, the pictures on the walls are not interfered with. In all, forty-nine architects are represented in the exhibition, and as several of them send in more than one set of drawings, these are fifty-four in number.* Of members of the profession in Glasgow, eighteen have contributed their sketch designs to the present exhibition. London architects are next in strength, their contingent numbering twelve; Edinburgh follows with four, and Manchester with three. Other cities and towns have one representative each, namely,—Alloa, Aberdeen, Birmingham, Bradford, Barnsley, Belfast, Leith, Dundee, Halifax, Kilmarnock, Leeds, and Sheffield.

The exhibition is, no doubt, as the *Glasgow Herald* observes, an interesting one, though from the figures we have given it will be seen that not half of the competitors have responded to the appeal of the promoters of the exhibition, probably because they take our view of the matter, viz., that the decision of the professional assessor (Mr. Charles Barry) having been generally accepted by the competitors as satisfactory, any review of the preliminary sketch designs can now serve no useful purpose.

THE PRESTON GUILD AND THE OPENING OF A NEW RAILWAY.

THE celebration of the Preston Guild this week has been accompanied by the opening of a new railway between Preston and Southport. The line is designated the West Lancashire Railway, and the opening of the new line will materially reduce the distance between the two towns. The old route is circuitous, and twenty-two miles in length, whilst the distance between Preston and Southport by the West Lancashire route is only fifteen miles, proceeding along the coast of the river Ribble, and bringing the two towns within from twenty minutes to half-an-hour's ride of each other. By a branch from the main line, crossing the valley of the Ribble, a short distance from Preston, the West Lancashire line will be connected with several of the manufacturing towns on the east side of the county, the company having obtained running powers over several portions of the Lancashire and Yorkshire system, extending to those towns. The new line is carried across the River Ribble into Preston by a massive girder bridge in six divisions, and on Friday week the line was inspected by General Hutchinson, the Board of Trade Inspector. The first trial trip over the bridge was made early in the morning. The train, which consisted of first, second, and third class carriages, was drawn by a heavy engine, and amongst the passengers were Messrs. Fox and Brunlees, the engineers-in-chief; Mr. Thursby, the resident engineer; Messrs. Braddock & Matthews, the contractors; Mr. Gilbert, the manager; and many others. The train returned to Southport, at twelve o'clock, to meet General Hutchinson, accomplishing the distance in half an hour. It shortly afterwards left again for Preston, for the purposes of the inspection. Four large and powerful engines were used to test the bridge over the river Ribble. The engines stood upon the bridge, and ran across it five times at full speed, and the deflection was only a quarter of an inch. The whole of the line proved to be satisfactory, and it was passed by General Hutchinson. It was opened for traffic on Monday, and has daily during the week brought large numbers from Southport, who are attending the Guild festivities. At Preston and Southport two large and commodious stations are in course of erection, both structures being exactly uniform in architectural design.

* In the competition, 125 sets of sketch designs were sent in, by 110 competitors.

RAILWAY CLOCKS.

SIR,—No doubt to the denizen of the "Empire on which the sun never sets," the sun is the great clock, and "railway time" is simply a mechanical necessity of 1882, from rapid transactions of trade, &c. Any boy knows this who looks up at Bennett's in Cheapside; but railway time affects every social relation of life, like the Post-office does. Two of your correspondents have written on this subject, and it seems the present clocks of all the companies suffer from "draughts," "damp," and "oscillation." I am not an expert, but humbly submit, sir, could not these difficulties be got over? Many would argue that the minimum of oscillation is when clocks, &c., are fixed to walls, &c., or on terra-firma, but would it not be possible (at small cost) to fix every railway clock, wherever placed, in a second strong case of metal or oak, lined with ¼-in. vulcanised lining? In this case there might be an apparatus on the binnacle, "ship-lamp," or "endless joint" principle, the clock itself to be attached above and to this by hook, screw, or otherwise. Railway train or "earth tremor," or such like, would surely not affect this arrangement as much as a firm fixture,—that is, of course, always provided that the pendulum proper is not affected by this isolated or pendulous treatment. I apprehend not. Then if this minimises the shaking, the double case and lining will cure the draughts and damp.

En passant, that picture discovery from Pompeii is simply marvellous! (the "Solomon's judgment on the true mother"), because a few years ago the religious world feared science, but Bibical knowledge has been strengthened by science. LAKEMAN HERBERT.

FOG SIGNALS.

SIR,—Will some one of your readers give me particulars as to the cost of fog-signalling on the railways in this country, as I am unable to procure sufficient particulars from their balance-sheets?

LECTOR CONSTANS.

SCHOOL BOARD SCHOOLS.

Felling and Felling Shore (*Heworth*).—Three groups of schools are at present in course of erection to meet the deficiency of school accommodation in the Heworth School Board district. Two have been completed, and were opened on Monday last, whilst the third, which is being erected at Windy Nook, will be completed in the course of a few months. The Felling schools are arranged to accommodate 725 children. The building is in two stories, and the characteristic features of the interior are the large number of class-rooms provided, with the facilities that exist for easy and direct supervision by the heads of departments, and the means that are provided to enable all the children to approach and leave their several class-rooms without noise or disturbance to the rest of the scholars. Mr. G. Waddell, of Edinburgh, was the contractor for these schools, and the cost of their erection has been 3,461*l.*, or 5*l.* 5s. per scholar. The schools at the Felling Shore are for infants only, and the work has been carried out by Mr. Alexander Thompson, contractor, of Gateshead. Messrs. Oliver & Leeson, of Newcastle-on-Tyne, are the architects for the three groups of schools.

Lambeth.—A new school in the Lambeth Division of the School Board for London, situate in Mina-road, Old Kent-road, has been opened. The school is built to accommodate 420 boys, a like number of girls, and 558 infants, making in all, 1,398. The site comprises 19,213 square feet, and the cost of the building, independently of the site, is 13,130*l.*, or 9*l.* 7s. 6d. per head. The builder is Mr. C. Wall, of Chelsea, and the architect is Mr. E. R. Robson. The building has a spacious playground at the back, part of which is covered in with an iron roof, to enable the children to take their exercise during wet weather. The playground is the largest open space within a considerable area, and it is hoped that the Board will see their way clear to allow it to remain open to the children of the neighbourhood for a reasonable time after school hours.

Builders' Benevolent Institution.—The dinner in aid of the funds of the above-named Institution will take place at the Freemasons' Tavern, on Thursday, the 2nd of November, Mr. J. T. Chappell, president in the chair.

Books.

Practical Organ Building. By W. G. DICKSON, M.A., Precentor of Ely Cathedral. Second edition. Crosby Lockwood & Co. 1882.

THIS is one of the "Weale's Series" of books, and is intended to afford practical information and instruction to those who wish to follow the very interesting employment of building an organ for themselves. The writer, of course, does not, in a book of this kind, go into all the refinements of mechanism adopted in modern large organs, such as pneumatic lever action, pistons, &c. These are not necessary in a small organ, and cannot be satisfactorily made without more elaborate mechanical resources than an amateur can usually afford to have at his command. The action shown in the diagrams is the usual action adopted in ordinary organs of moderate size, and the parts are sufficiently shown in the diagrams to enable any one with a capacity for using tools and understanding drawings to work from them. We can hardly say the same in regard to the pipe diagrams and descriptions, which are not by any means so clear as might be; and we doubt whether any one coming to the book with no previous knowledge of the principles and practice of making organ pipes would be able to make one from the information and illustrations here given. The diagrams are too small in scale, and do not explain themselves sufficiently. We are aware that the low price put on the "Weale's Series" books renders elaborate diagrams impossible, in view of economical considerations. The publishers have done what they could, no doubt, but it is hardly sufficient for the purpose. But in one or two cases there is a defect in the method of drawing also, as in the section of the foot of a wooden pipe (fig. 3), where portions which are separate pieces are drawn in section as if they were cut out of the solid.

In the main, however, the author seems to be well up in the practical part of his work; but, after all, the end and object of organ-building is a musical and not a mechanical one, although we have observed that with not a few persons who indulge in private organ-building the mechanical interest seems entirely to obliterate the musical object of the work. Those who go into amateur organ-building on this ground, of course, have their reward; but to those who look also to the musical ends for which organs are supposed to be constructed, our advice to those about to build small organs would be in the same brief terms as *Punch's* well-known advice to those about to marry. The genuine qualities of the organ as a musical instrument are, to our thinking, never realised except when the instrument is on a tolerably large scale. Little organs bring into prominence all the characteristic defects of the organ and minimise its beauties; and if small organs for sitting-rooms are built, some of the recommendations made by the precentor of Ely (whose musical notions seem as old-fashioned as those of cathedral precentors almost proverbially are) should be carefully eschewed. We will mention, however, one in which we are disposed to support him, the rather because it is one in which, as he himself says, he is likely to find very few persons to agree with him,—that is, in the recommendation that when, in small church organs, only two keyboards can be afforded, the second keyboard should be not, as usual, a "swell" organ, but a "choir" organ. Variety of tone and the highest qualities of organ effect are far better attained by the bright and varied tones of the pipes standing free in the usual form of "choir organ," than by shutting up pipes in a box and letting them sound through shutters occasionally opened and closed. The swell is an expressive adjunct to the organ, but its importance has been much overrated in England (where it was invented) and its use much abused; and we are glad to support Mr. Dickson in his suggestion on this head. But in other points his recommendations are painfully old-fashioned. He speaks of stops being made to draw in halves, treble and bass, a proceeding which is utterly useless, and which none but a hopelessly muddle-headed builder would ever think of adopting nowadays; it is found only in old English organs, built when people knew no better. But, still worse, the author not only recommends the system of "grooving" one stop into another, but even speaks of it as if it were the natural and inevitable way of building small organs. Grooving, it may here be explained, is an operation used when there is

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supposed to be not room enough or not money enough to have some particular stop complete, and so the lower octave of pipes, perhaps, which should belong to that stop, is omitted, and the lowest octave of sounds is borrowed from the pipes belonging to another stop, which are thus made to do double duty. Now, we beg to point out (and we speak with the advice of those who are competent judges of the subject) that this practice is, from a musical point of view, simply detestable, and is one of the worst of the old prevalent vices of English organ-building, which are now happily getting disused. To any persons possessed of ordinary common sense it must need only very slight musical knowledge to perceive that such a process not only breaks the continuity of tone in a stop, but it leads to the result that when the stops are used together, the lowest octave, which ought if anything to be the strongest and firmest in tone, is the weakest, having only one set of pipes against two in the upper octaves. Every one who looks at an organ,—or, we should rather say, listens to it,—from a musician's point of view, would, we are assured, tell Mr. Dickson and his readers that it is far better to omit a stop altogether than to make up a sham list of stops by such a wretched makeshift as grooving; and it is a pity that any book on the subject should have been put forth recommending such a practice, unless the object of organ-building, in the author's view, is merely to exercise a talent for joinery, without consideration of the ultimate musical result.

We fear the frontispiece, also, which gives a view of a small organ built by the author, suggests other criticisms more directly from our own point of view. The organ is represented as placed under a low arched organ-chamber, the front pipes only projecting from the mouth of the cavern. This, as has been more than once pointed out in the *Builder*, is the worst position that an organ can be placed in. An organ ought to have free space all round for the sound to develop; nothing militates against its tone so much as cooping it up in a closet in this way; and, besides, it is very desirable that i should be in a position where there is plenty of light, for darkness means the unseen accumulation of dust and dirt, and increased difficulty in inspection and repairing. This, again, ought to seem a matter of mere common sense; and yet architects and clergy go on smothering organs in what they call "organ-chambers," as this were the only orthodox way of treating the instrument.

A Hand-Book and Guide to Preston. By WM. POLLARD. Preston: H. Oakey, Fishergate. 1882.

CARE has been taken to provide the large number of persons visiting Preston this week with an inexpensive and compact little hand-book. Mr. William Pollard has done his work very satisfactorily, and has given a history of the town as well as a clear and comprehensive account of the various buildings and the environs.

VARIORUM.

MESSRS. LONGMANS, GREEN, & Co. announce the first number of a new Magazine, to be continued monthly, under the title of *Longman's Magazine*, each number consisting of from 100 to 128 pages, price 6d. The articles will in most cases be signed by the contributors, and the editor will be personally answerable for the opinions of the anonymous writers only. A strong list of writers is given.——"*The Footsteps of St. Paul in Rome*" is an admirable little memoir by S. Russell Forbes (of Rome), treated from an archæological point of view. It is published by Thos. Nelson & Sons, London. ——The September number of *Belgravia* is a good one. The serial story in it, "All Sorts and Conditions of Men," by Walter Besant and Jas. Rice, increases in interest.——In the *Gentleman's Magazine*, a chapter headed "An Author at Home" gives some account of the private life of Mr. Charles Reade, and shows him to be of a liberal turn of mind.——Cassell & Co. have commenced the issue of a pictorial edition of "The Arabian Nights Entertainment," to be completed in sixteen sixpenny parts. It will contain 400 illustrations by Gustave Doré and other well-known artists, and promises to be a remarkable book of its kind. ——From "Our Houses and How to make them Healthy" we get the following paragraph on "Sanitation in the Eighteenth Century": — Though it is somewhat difficult to arrive at any very precise estimate of the sanitary condition of the great towns at the commencement of the eighteenth century, sufficient records exist to show that a steady increase must have taken place both in personal and public cleanliness. The average of deaths from colic and dysentery decreased with remarkable activity, so much so that in the last decennial period of the century the annual average of deaths from these causes was little more than a tenth of what it had been in the first one. The cause of this decrease is attributed by a writer at the beginning of the present century to the improvements which took place in all the great towns, in the manner of living, but particularly in respect to cleanliness and ventilation. In many provincial towns, however, the sanitary arrangements were but little in advance of those in the Middle Ages. In the year 1855 Mrs. Mary Bartlett, aged 105, described to Mr. Edwin Chadwick how, within her own recollection, it was dangerous to walk the streets of Exeter after dark "for fear of being befouled by what was thrown out of the windows, and during rain by the water-spouts from the unguttered houses." The old custom of strewing the floor with rushes also survived until the middle of the eighteenth century. In seaside towns sand did the work of rushes. Brussels carpets were introduced from Tournay in 1745, and by the year 1760 the floors of all respectable houses were carpeted. The subject of ventilation appears to have received little or no attention in this country until the close of the seventeenth and the early years of the eighteenth centuries.

Miscellanea.

Disfiguring Buildings.—The Canterbury magistrates have been called upon to investigate a case in which the Dean and Chapter of the Cathedral prosecuted a visitor to the city for an act of wanton mischief in the nave of that building by scratching his name on one of the piers. It was stated that it was a very common practice among strangers who visited the cathedral to write or scratch their names upon the columns and other conspicuous parts of the stonework, but hitherto the authorities had been unsuccessful in their attempts to make an example of one of the offenders. The present defendant was caught in the act by a gentleman who had undertaken the part of amateur detective to the Chapter. Mr. H. G. Austin, the cathedral seneschal, said the Chapter did not press for a heavy penalty, but desired merely a conviction as a warning to others. A great amount of damage had been done in different parts of the cathedral, especially in the north-west transept, and the authorities were determined to put a stop to it. The Bench fined the defendant 1*l.* 8s. 6d., with the alternative of fourteen days' imprisonment. It is to be hoped this incident will act as a warning to other foolish people.

Appointment of Surveyors and Architect for Ripon Diocese.—At a meeting of the archdeacons and rural deans of the diocese of Ripon, held under the presidency of the bishop, at the Palace, Ripon, it was resolved that Mr. Ralph Nicholson, of 55, Parliament-street, Westminster, and Mr. C. R. Chorley, of Headland-buildings, 15, Park-row, Leeds, be elected diocesan surveyors of dilapidations for the diocese of Ripon, under the provisions of the Ecclesiastical Dilapidations Act, 34 and 35 Vict., c. 43, and that they continue in office for three years from this date on the same terms as heretofore. It was also resolved that Mr. J. Oldrid Scott be elected diocesan architect for the diocese of Ripon, in the place of the late Mr. G. E. Street, at a salary of 50*l.* This resolution is subject to confirmation by the general meeting of the society next spring.

Fleet-street Improvements.—On Tuesday, says the *City Press*, tenders were received for erecting the new building in Fleet-street (at the corner of Chancery-lane) for Messrs. George Attenborough & Son, from the designs of Messrs. Archer & Green, of Buckingham-street, Strand. Those sent in are as follow:—Messrs. Mowlem & Burt, 11,962*l.*; Messrs. Perry & Co., 11,000*l.*; Messrs. Colls Brothers, 10,697*l.*; Messrs. Holland & Hannen, 10,680*l.*; Messrs. Bywater, 10,123*l.* The latter tender was accepted, and the works will be forthwith commenced.

The Parkes Museum.—The Council of the Parkes Museum have just acquired new premises in Margaret-street, Cavendish-square, to which the museum is to be removed from University College as soon as the alterations and additions which are now being made, under the direction of Mr. Mark H. Judge, A.R.I.B.A., are completed. The new museum will consist of a central hall, suitable for meetings and lectures; a library; and corridors, all lighted from the top, and well suited for exhibition purposes. The meetings and lectures on sanitary and other matters connected with the health of the people, which were only occasional while the museum was at University College, will form a permanent feature of the institution when it is re-opened in Margaret-street. Capt. Douglas Galton, C.B., F.R.S., presided at the last meeting of the Council, when a letter was read from Mr. Thomas Twining, of Twickenham, offering to contribute a special donation of 100*l.* towards the expenses incidental to the change of quarters. It is expected that the museum will be re-opened before Christmas.

Burnley.—The Burnley Board of Guardians, on the 31st ult., adopted the plans of Mr. T. Bell, architect, for the new cottage-homes and schools at the workhouse. The plans show four cottage homes, capable of accommodating twenty-six children each. These cottage homes are to be erected on the plot of land now used as a meadow, in front of the main building. The school will be erected between two cottage homes, and will be capable of accommodating 110 children. The boys will occupy the home nearest the turnpike road, and the girls will be placed on the Infirmary side. Each home is intended to be under the superintendence of a "mother," and the children will do the whole of the work in connexion with each block, except the washing and baking. On the ground-floor there are to be day-room, dining-room, kitchen, scullery with pantry, lavatory, and store-room. On the second floor there will be two dormitories,—one to accommodate 16 and the other 10 children, and the nurses' bedrooms are so placed as to overlook both dormitories.

An Achievement.—Mr. S. C. Hall, F.S.A., recently entertained a number of ladies and gentlemen in Plymouth with a discourse on the remarkable men and things he has known. Admission was by invitation ticket issued by the Mayor, and such was the desire to hear Mr. Hall that more tickets were issued than would fill the room. All were not able to come; but as many came as rendered the room uncomfortably warm. The Mayor (Mr. C. F. Burnard) presided. After a most interesting address, delivered in a strong audible voice, and extending in delivery over two hours and a half, Mr. Hall concluded by expressing his great interest in the Plymouth Free Library, and his desire to promote its usefulness. A cordial vote of thanks, moved by Mr. I. Latimer, and seconded by Mr. R. C. Serpell, followed by a similar recognition of the Mayor's services in presiding, brought to a close an entertainment which gave great pleasure to those who were present.

Another London Theatre Burned Down.—Early on Wednesday morning the Philharmonic Theatre, Upper-street, Islington, was completely destroyed by fire. The theatre was closed about twelve o'clock on Tuesday night, and at ten minutes to one o'clock a policeman on duty saw smoke issuing from the main building. By about three o'clock the whole of the theatre,—stage and auditorium,—was nearly burnt out, and most part of the roof was burnt off. The property and dressing rooms, which are apart from the main building, were not materially damaged. The cause of the disaster has not been ascertained. The theatre thus destroyed was originally built as a music-hall, and was opened about twenty-two years ago. If we mistake not, it had only lately undergone reconstruction to a material extent.

A Pastoral Staff.—A pastoral staff, prepared by the diocesan architect, has been presented to the Bishop of Bath and Wells. It is designed to illustrate the histories of Glastonbury, Bath, and Wells in their connexion and independence, the main imagery of the crook applying to the name of Wells. The plan of the crook is hexagonal. Engraved upon the staff are the words, "Thy rod and Thy staff comfort me." The Earl of Cork made the presentation, and Archdeacon Denison presented an address. The Dean of Wells and Mr. R. H. Paget, M.P., also took part in the proceedings.

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The Borough Surveyorship, Swansea.—At a special meeting of the Swansea Town Council, on the 30th ult., the election of a borough surveyor took place. From the large number of 100 candidates for the appointment, the special committee had selected seven, as follows:—Mr. George Bell, aged 32, assistant engineer to the Swansea Corporation for the past seven years; 2, Mr. P. B. Coghlan, aged 40, engaged under the London School Board and in private practice; 3, Mr. W. A. de Pape, aged 35, Tottenham; 4, Mr. J. M. Thomas, 32, assistant surveyor to the Swansea Corporation; 5, Mr. W. H. Wardle, 32, assistant surveyor, Bolton; 6, Mr. Winter, chief assistant surveyor, Liverpool; 7, Mr. R. H. Wyrill, aged 31, of Leeds, in private practice. It was arranged that the candidates should be called into the chamber *seriatim*, the testimonials of each being read before he was seen. This being done, all the candidates being called in and questioned, with the exception of Mr. W. A. de Pape, who was not in attendance, and so was disqualified, the result of the voting was as follows:—For Mr. Wyrill, 14; for Mr. Bell, 5; for Mr. Thomas, 3. On the motion of Mr. Cady, seconded by Mr. Burnie, Mr. Wyrill was elected.

New Clock and Carillons for Bombay University.—A native of Bombay, Mr. Premchund Rogchund, having munificently provided the necessary funds for a large clock and carillons for Bombay University, the India Government entrusted the work to the following firms:—The bells to Messrs. John Taylor & Co., of Loughborough, Leicestershire, founders of the new ring of twelve bells for St. Paul's Cathedral, and of Great Paul; the iron bell-frame to Messrs. Westwood, Baillie, & Co.; and the clock and carillon machinery to Messrs. Lund & Blockley, of 42, Pall-mall, by whom the whole of the work has been erected and put in operation in London, preparatory to its shipment to Bombay. The bells are sixteen in number, in the key of C (twelve consecutive and four half-notes). The largest weighs about three tons, and the whole peal about twelve tons, and they are contained in a wrought-iron bell-frame, weighing about seven tons more.

Modern Mosaics.—At the cost of Mr. Bateson de Yarburgh, the reredos of St. Paul's Church, Heslington, has recently been richly embellished by the introduction of a series of beautiful mural decorations carried out in Venetian glass mosaic. The work in question comprises the decoration of nine panels at the east end of the church, and the subjects represented in the four principal panels are full-length figures of the Evangelists, with emblematic devices and inscriptions. The figures are in colour, and stand out prominently from the rich gold background which surrounds them. The smaller panels are treated with floriated designs, and the central panel contains an ornamental Maltese cross. The work, which has given great satisfaction, has been carried out by the well-known Venice and Murano Glass and Mosaic Company, of 30, St. James-street, London.

Electric Lighting.—At the last meeting of the Fulham District Board of Works, the seal of the Board was affixed to an agreement with the West Middlesex Electric Lighting Company, empowering the company to lay wires enclosed in pipes under the footways, throughout the parishes of Fulham and Hammersmith,—the distance of roads in the district being thirty-seven miles, and containing 20,000 houses. It is proposed to erect, at suitable points, central stations upon a large scale, within the two parishes, for the purpose of generating electricity. Gramme dynamo machines will be used for this purpose. For street lighting Brockie's arc lamps will at present be fixed, and for shops and private houses, the Improved British Incandescent Lamp.

Boring Operations with Boart.—A correspondent writes:—"In the course of some boring operations which have recently been carried on by the Government of the Cape of Good Hope in the search for coal, it occurred to the geologist in charge to make trial of native boart in lieu of the Brazilian carbonado, which had, until then, been employed. The experiment proved a complete success. The last six crowns used were of 3 in. diameter, set with boart. It was found that these bored through 1,100 ft. of sandstone and shale, part of it exceedingly hard, being indurated by contact with intrusive rock. The average boring per crown was therefore 183 ft., and the last crown is nearly as good as new."

Proposed Municipal Buildings at Hyde. At a meeting of the Hyde Town Council, on Monday night, a memorial, signed by 2,262 ratepayers, was presented, urging the Council, in consequence of the unsatisfactory termination of the public meeting lately held to discuss the scheme for erecting municipal offices for the borough, at a cost of 8000*l.*, to reconsider and abandon the scheme, a large majority of the constituents being opposed to it. The Council, however, were of opinion that it would be to the interest of the present and future ratepayers that the scheme should be proceeded with. Mr. J. W. Beaumont, Manchester, has been appointed the architect, and Greenfield House will be taken down to make room for the new building.

The Coalbrookdale Company have taken premises at Nos. 43 and 44, Holborn Viaduct, as London showrooms, for their well-known manufactures, and purpose to keep there a selection of the principal articles in grates, stoves, ranges, gates, railings, &c., made at their foundry in Shropshire. The rooms will be under the charge of Mr. Henry Ch. Eyres. The Coalbrookdale Company, as among the very first of the manufacturing firms who, after the Great Exhibition of 1851, sought to bring in art to the elevation of their works, well deserve a warm recognition at our hands.

Dorking Sewerage.—At a meeting of the Dorking Local Board, held on the 29th ult., a report was received from the Sewerage Committee, stating that the Committee had examined the report of Messrs. Smith & Austin, the consulting engineers to the Board, for the sewerage of the town, and recommending that the same be approved and adopted, and that the engineers named be instructed to proceed with the preparation of the working plans and sections. This was agreed to.

Art in Liverpool.—On Saturday last, over 1,500 persons attended the "private view" of the collection of pictures and sculpture in this season's autumn exhibition, held in the Walker Art Gallery, under the auspices of the Liverpool Corporation, and ninety-one pictures were sold, realising 1,328*l.* The collection comprises 826 oil paintings, 741 water-colour drawings, and 38 pieces of sculpture. Sir F. Leighton's "Phyrne" occupies a prominent place in the exhibition.

Royal Commission on Technical Instruction.—The members of this Commission have not been idle during the past month. Considerable progress has been made in the collection and arrangement of the vast amount of information collected by the Commissioners during their visit to France, Germany, Austria, Switzerland, and Italy. They have recently been engaged in pursuing their investigations here and abroad.

Newport (Mon.).—The clergy of Holy Trinity parish, having held services for years past in small rooms lent or hired for the purpose, feel it desirable that a permanent and commodious building should be erected. A central and very suitable site has been promised by the Tredegar Wharf Company, and plans, prepared by Mr. E. A. Lansdowne, of Newport, have been approved by the committee. The total cost will be from 2,500*l.* to 3,000*l.*

The Jablochkoff Electric Light Company have taken large premises on the Albert Embankment, to be used as a manufactory for their carbon candles, as a warehouse, and as a lighting centre. They are also about erecting a building on the Victoria Embankment for the purpose of more effectually carrying out their contract with the Metropolitan Board of Works.

The Fylde Union Sanitary Authority have obtained designs from several civil engineers for sewering the town of Poulton, and the districts of Breck, Skippool, and Little Poulton, and the scheme of Mr. Alfred M. Fowler, Manchester, has been accepted.

TENDERS

For the erection of warehouses and timber store, Bunhill-row, for Mr. W. Walker. Messrs. Davis & Emanuel, architects, 2, Finsbury-circus, City. Quantities by Mr. Fredk. Downing, 7a, Whitehall-yard:—

John Mowlem & Co.	£13,300 0 0
Higgs & Hill	13,180 0 0
Colls & Son	12,700 0 0
B. E. Nightingale	12,531 0 0
John Grover	12,450 0 0
G. S. Pritchard	12,417 0 0
Thos. Boyce	12,400 0 0
Ashby Bros.	12,378 0 0
McLachlan & Sons	12,334 0 0
Ashby & Horner	12,250 0 0
W. Brass	12,087 0 0
E. Lawrance	11,967 0 0
Sabey & Son	11,349 0 0

For the erection of a villa residence, on the Burgess-hill Park Estate, Sussex, for Mr. Thos. Cracknell. Messrs. R. S. Hyde & F. W. Hyde, architects, Brighton:—

Patching & Son	£1,928 0 0
Hollands	1,780 0 0
Lockyer	1,747 0 0
Garrett Bros.	1,595 0 0
Dean	1,550 0 0
Downer	1,490 0 0
S. Norman, Burgess-hill (accepted)..	1,450 0 0

For building new stores, dwelling, and offices, Broad-street, Teddington (exclusive of shop fronts and fittings), for Messrs. C. & A. Deayton. Mr. Thos. R. Richards, architect, 17, King-street, Cheapside. Quantities by the architect:—

T. Boyce	£2,247 0 0
J. Piller	2,215 0 0
F. Sims	2,175 0 0
Sweet & Loder	2,143 0 0
Harris & Wardrop	2,074 0 0
H. J. Whitman	2,033 0 0
J. F. Collinson	1,970 0 0
T. & W. Hickinbotham (accepted)...	1,965 0 0
T. J. Messom (withdrawn)*	1,875 0 0

* Error in casting.

For new organ-gallery, chapel-keeper's room, and other additions, Upton Chapel, Lambeth-road. Mr. Chas. Henry Searle, architect, 12, Southwark-street. Quantities by the architect:—

Little	£2,073 0 0
Falkner	1,898 0 0
Rider & Son	1,658 0 0
L. H. & R. Roberts	1,647 0 0
Ford & Sons	1,625 0 0
Nightingale	1,623 0 0
Wilson & Exton	1,605 0 0
Higgs & Hill	1,577 0 0

For proposed hospital, St. Paul's Cray, Kent, for the Committee. Mr. G. St. Pierre Harris, architect. Quantities by Mr. C. Stanger:—

		Deduct for wall and fence.
Wood	£2,857 0 0	£454 0 0
Ottway	2,582 0 0	420 0 0
Wiltshire	2,570 0 0	470 0 0
Grover	2,488 0 0	498 0 0
Taylor & Parfitt	2,457 0 0	487 0 0
Taylor & Son	2,386 0 0	441 0 0
Crossley	2,410 0 0	477 0 0
Douglas Payne	2,343 0 0	438 0 0
Ormond & Son	2,367 0 0	478 0 0
Baldwin	2,380 0 0	500 0 0

For rebuilding professional residence, St. John's-hill, for Dr. J. H. Bertillow. Mr. Wm. West, architect, 36, Southampton-street, Strand:—

W. Perrin (accepted)	£850 0 0

For sundry works at the Blackstock Hotel, Finsbury Park. Mr. Wm. West, architect:—

J. Oldis (accepted).

For the erection of farm buildings on the Imberhorne Estate, East Grinstead, for Mr. Edward Blount, C.B. Mr. S. W. Haughton, architect, East Grinstead. Quantities by the architect:—

Pledge, East Grinstead	£1,175 0 0
Waters, Forest-row	1,141 12 0
Godly, East Grinstead	1,100 0 0
Charlwood Bros., East Grinstead*	885 0 0

* Accepted.

For the erection of a lodge on the Imberhorne Estate, East Grinstead, for Mr. Edward Blount, C.B. Mr. S. W. Haughton, architect, East Grinstead. Quantities by the architect:—

Penn Bros., Pembury	£625 0 0
G. Beard, East Grinstead	539 0 0
J. Waters, Forest-row	535 0 0
Charlwood Bros., East Grinstead	524 0 0
J. H. Godly, East Grinstead (accepted)	489 0 0

Accepted for villa residence, Bank Field, Kendal, for Mr. T. C. Wilson. Mr. Robt. Walker, architect, Kendal:—

E. Hutton (walling, &c.).
E. Nelson (joiner's work).
J. Robinson (plastering).
C. Nowell (plumbing).
J. Hine (painting and glazing).
H. Goulding (slating).

Accepted for Wesleyan Chapel and caretaker's residence at Bowness. Mr. R. Walker, architect:—

G. H. Pattinson (walling, &c.).
J. S. Parker (joiner's work).
C. Palmer (plastering).
T. Russell (plumbing).
F. G. Croft (painting and glazing).

Accepted for villa residence at Windermere, for Mr. B. A. Irving. Mr. R. Walker, architect:—

Martindale & Co. (walling, &c.).
J. Thompson (joiner's work).
H. B. Armstrong (plastering).
The Windermere Gas Co. (plumbing).
Heaton Bros. (painting and glazing).

For Conservative Club, Maidstone. Mr. Hubert Bensted, architect, Maidstone. Quantities by Mr. Thomas Ladds, Tunbridge Wells:—

Pryer & Co.	£4,084 0 0
Avard	3,949 0 0
Naylor	3,937 0 0
Clements (accepted)	3,794 0 0
Cox Bros.	3,790 0 0

For rebuilding Monkswood Church, Monkswood. Mr. E. H. Lingen Barker, architect:—

J. Morgan, Dingestow	£904 7 0
Coleman Bros., Chaxhill	879 0 0
J. Cook, Hartlebury	825 0 0
Davies & Johnson, Pontypool	618 0 0
W. Davies, Usk	600 0 0
E. Giles, Little Mill (accepted)	593 0 0

For main sewer, Wokingham:—

Pollard & Co., London	£235 0 0
Collier, Reading	200 0 0
J. Allcock, Camberley	199 17 0
J. Botterill, Reading	190 0 0

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For building additions to the Wilts and Dorset Bank, for the Wilts and Dorset Banking Company, Calne. Mr. Fred. Bath, Crown Chambers, Salisbury, architect. Quantities supplied:—

A. Livermore, Tetbury	£1,300	0	0
George Chivers, Calne	1,204	0	0
R. B. Mullings, Devizes	1,102	0	0
Thos. Beazley, Calne (accepted)	1,044	0	0

For building shop and dwelling-house in Catherine-street, Salisbury, for Mr. Samuel Parker. Mr. Fred. Bath, architect. Quantities supplied:—

John Wort, Salisbury	£975	10	0 !
H. J. Kite, Salisbury	945	3	0
George West, Salisbury	942	7	6
P. Tryhorn, Salisbury	929	10	0
Wm. Roles, Salisbury	896	2	0
Edward Abley, Salisbury	855	10	0
E. Young & Sons, Salisbury	815	0	0
Michael Walker, Salisbury*	475	0	0 !

* Architect resigned rather than take this tender for the work.

For building additions to the Wilts and Dorset Bank, Melksham, for the Wilts and Dorset Banking Company. Mr. Fred. Bath, architect:—

F. & W. Long, Bradford-on-Avon	£550	0	0
Blake & Davis, Melksham *	542	18	8

* Accepted subject to a slight reduction.

For building nine cottages on Bickerley-common, for the Ringwood Cottage Building Company, Limited. Mr. Fred. Bath, architect to the Company:—

E. Young & Sons	£2,606	0	0
Jenkins & Son	2,450	0	0
Tuck & Carley	2,056	0	0
W. E. Alexander	2,033	0	0
H. J. Kite	2,023	0	0
John Wort	1,966	0	0
Edward Abley	1,925	0	0
M. Rowland	1,805	0	0
C. Davis	1,760	0	0
A. Head*	1,650	0	0
H. Barrow	1,575	0	0

* Accepted, being the lowest after deducting sum allowed for old materials.

For proposed additions to the Grammar School, Maidstone, Kent. Mr. E. W. Stephens, architect, Maidstone:—

Naylar & Son	£1,477	0	0
Elmore	1,410	1	0
Avard	1,395	0	0
Cox Bros.	1,376	0	0
E. Vaughan	1,366	0	0
Wallis & Clements	1,297	0	0
Pryer & Co., Maidstone (accepted)	1,297	0	0

For repairs at No. 14, Moscow-terrace, and No. 1, White Post-lane, Hackney, for Mr. J. Grist. Mr. H. I. Newton, architect, 27, Great George-street:—

Sainy	£157	10	0
Dowling	129	0	0
Green & Sons	107	0	0

For shop fittings in York-road, Battersea, for Messrs. Simson & Errington. Mr. H. I. Newton, architect:—Simpson (accepted).

For the erection of shops and houses at Stepney, for Mr. W. P. Barnes. Messrs. Hammack & Lambert, architects:—

Bangs & Co.	£18,690	0	0
Hearle & Son	18,200	0	0
Cardus	17,900	0	0
David King & Son	17,300	0	0
Killby	17,190	0	0
Boyce	17,100	0	0
Johnson	16,990	0	0
Wood	16,983	0	0

For the construction of roads, sewers, &c., to the first portion of Fitzgerald Estate, Church End, Finchley, the property of Mr. Charles Bates. Mr. Walter Hall, surveyor:—

Ford & Everett, Westminster	£1,190	0	0
P. G. Pound, Bow-road	1,187	0	0
Beadle Bros., Erith	1,040	0	0
McDowell & Dawson, Stoke Newington	940	0	0
J. Pizzey, Hornsey (accepted)	848	10	0

Accepted for rebuilding warehouse, Chapeltown, Halifax. Mr. T. L. Patchett, architect, Halifax:—
J. S. Carey & Son, Halifax (masons' work).
John Atkinson, Halifax (carpenter and joiner).
John Firth, Halifax (slater, &c.).
George Walker, Halifax (plumber and glazier).

For kerbing and channelling Rose-street, in the township of Urmston, for the Barton-upon-Irwell Sanitary Authority. Quantities supplied by Mr. John Price, C.E.:—

M. Naylor, Hulme	£254	4	0
Snape & Sons, Eccles	253	2	0
J. Oakes, Kearsley	250	11	6
W. H. Worthington, Manchester	243	14	1
G. Gusworth, Moss Side	242	6	4
E. Bird, Chorlton	240	0	0
J. Randall, Weaste	239	12	6
J. Mackay, Hereford (accepted)	235	14	2
S. Holt, Miles Platting	202	12	6

For additions to house, stabling, and entrance-lodge at Kemnal-road, Chislehurst, for Mr. W. M. Walker. Mr. George Lethbridge, architect. Quantities by Mr. C. H. Goode:—

Patman & Fotheringham	£5,392	0	0
Lowe	4,993	0	0
Ashby Bros.	4,880	0	0
Higgs & Hill	4,760	0	0
Adcock	4,740	0	0
Harris & Wardrop	4,699	0	0

For blue brick paving and kerbing and channelling at Loughborough. Mr. Frank Baker, C.E., Town Surveyor:—

Gibbons, Leicester	£1,012	6	4
Lee, Leicester	953	4	4
Barker, Loughborough	948	5	4
Brown, Northampton	929	3	1
Knight, Loughborough	911	11	5
Cordon, Nottingham	897	15	0

Mr. Knight's tender has been accepted for the blue brick paving, and Mr. Cordon's for the kerbing and channelling.

Tavern, Storey's Gate.—In the list of tenders for rebuilding the Storey's Gate Tavern, Westminster, published by us last week (p. 323), the tender of Mr. Thos. Spearing, of Bennerly-road, Wandsworth-common, which amounted to 3,237*l.*, was, by the inadvertence of our correspondent, omitted.

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The Builder.

VOL. XLIII. No. 2067. SATURDAY, SEPTEMBER 16, 1882.

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Economic Science, and the State Purchase of Railways.

THE PRACTICAL KEY TO THE PROBLEM.

THE discussion, on August 29th, by the Section for Economic Science and Statistics of the British Association, of Mr. Watherston's paper, "A Plea for Unity of Administration of Railways," is hardly calculated to support the claim of an annual occasion of the kind to produce work more striking or more valuable than that which, week after week, is brought forward in the columns of the scientific press. It would be difficult more pregnantly to illustrate the difference between the steady worker, kept in the groove by a sense of public, although unnamed, responsibility, and the brilliant or the hasty essayist, than was afforded by the debate in question, whilst the great public interest taken in the subject has been insisted on, and ably enforced, by the *Manchester Guardian*. With the starting-point taken by Mr. Watherston, and with his views of what is desirable, —if only it were possible,—we fully agree. But we regret that the question of feasibility should not be put in the first rank, as this precaution would effect a great saving of time and of argument. Captain Douglas Galton touched upon the first points to which we have to refer, but was not prepared to go into them with that precision which is requisite in order to obtain definite results. How much railway capital, he inquired, is debenture or preference stock? Let us see.

That theoretically railways "ought to be public property," we hold to be indisputable. It is quite another thing to ask whether, after Parliament has authorised the spending of 745 millions by private companies on the construction of 18,000 miles of line, it is feasible to make the change; and further, if feasible, would the public be the gainer?

In the first place, out of the 728,000,000*l.* of railway capital existing at the end of 1880, 182,000,000*l.* has been raised by loans and debenture stock, and 276,000,000*l.* by guaranteed or preferential capital. This leaves only 270,000,000*l.* of ordinary capital,—a consideration of no little importance in attempting a practical view of the question. On the whole capital of 728 millions, the interest divided amounted to 4·38 per cent. This, then, is the value of the property to be acquired by the nation in order to carry out Mr. Watherston's plan. If converted into three per cent. stock, it would represent an amount of 1,062 millions sterling; and the annual interest for which the State would thus become responsible would be nearly 50 per cent. more than that now paid on the National Debt! But this is allowing nothing to the shareholders for compulsory purchase,—a feature of some importance in the case. Again, out of the 458 millions of loan, debenture, preference, and guaranteed capital, very little more than 13 millions now pays less than three per cent. interest. The bulk of the remainder receives between three and five per cent., and small sums run up to as much as 10 and even 15 per cent. It is thus evident that the Government would require more than the present net earnings of 32 millions to save themselves from loss by the transaction; probably considerably more. And this being so, from what source is any abatement of tariff to be made up? Either the railway customers, or the nation, would have to pay, and that no inconsiderable sum, for the mere transference of the property. Thus the first financial requisite, that of the lowering of rates and taxes, would be defeated by the charge made in order to secure it.

As to saving in working expenses, Captain Galton remarked that it could not possibly exceed some 500,000*l.* or 600,000*l.* out of a gross expenditure of 34,000,000*l.* sterling. It has yet to be shown that any saving whatever would be effected by the change. The only direct experience bearing on the question is that of the French, Belgian, and Italian railways, and that is to the effect that Government management is at the same time the most costly and the least efficient. Some paid chairmen and directors would, no doubt, disappear; but it is not to be thought that these gentlemen are paid for doing nothing; and how far their duties, whatever they may be, would be more cheaply and efficiently discharged by Government officials, has to be shown. As far as our own knowledge extends, we should say that the railway servants of the United Kingdom are as industrious, efficient, and as far from over-paid a body of men as can be found anywhere in the world, and we think there is every reason to expect that the substitution of Government management for that of the representatives of shareholders, interested in the cheap working of their lines, would be a steady and notable rise in the wages of every department of the great system, as compared with the work done.

At the same time, we would be the last persons to throw cold water on any serious discussion of the subject of the ultimate freedom of our railways. It is only when the question is approached without a full view of the magnitude of the difficulties that attend it that we have anything to say as a protest. For the State to purchase the property of the railway companies we hold would be a ruinous mistake. And this opinion we share with those French and Belgian statesmen who have studied the subject with clear and impartial intelligence, and at the same time with a knowledge and command of statistics that are not attainable as to English railways. But the prospect of the continuance of the English railway system as a source of mercantile profit to the capitalists who have found the money for making the lines is one that is attended by grave menace to the country. Within a short time the manufacturers of France and of Belgium will be able to command water-carriage at cost price, and railway carriage at very little more than cost price. To pay the modest 4½ per cent., which is only the net earning of our railway capital,—double freights and fares,—how will our manufacturers hold their own against those of the Continent who have only half as much to pay for transport as they have? This is a question not theoretic, but practical; not a long way off, but at the door; not to be brushed aside with the policy of the ostrich, but to be looked in the face.

Take one example, to show how the matter comes home. The value of copperas is less than 30s. per ton. Large works for the manufacture of alum and of copperas exist at Manchester. The rate charged by the railway companies for conveying this cheap undamageable material, in large quantities, from Manchester to Liverpool, or to Garston, is 7s. 6d. per ton,—more than a fourth of the selling price! But for conveying it to Glasgow, it is no less than 21s. 8d. per ton; while at the same time sugar, which is worth 20*l.* per ton, is conveyed for the same distance for 13s. 4d.! The distance is 225¼ miles. The cost of conveyance by canal would be about 6s. 3d., if a line of canal existed; and the cost by canal to the Mersey, and thence by sea to Glasgow, would probably be less. We think it probable that if the railway charges were based on the two elements of actual cost of transport and proportionate profit, from 16s. to 19s. per ton would be a fair charge to Glasgow, and something under 3s. a ton to Liverpool, as against 1s. by canal. The manufacturers in this case naturally complained before the Select Committee on Railways (Rates and Fares) as to inequality of charge. But there is something even more serious, as far as the country is concerned, than this inequality. It is the fact that the railway companies have closed the old routes from Manchester to Liverpool and from Manchester to Birmingham by water, while at the same time they cannot themselves (with justice to their shareholders) carry the material in question for the longer distance at a price that it can afford. To stop water-carriage from Manchester to Glasgow is to shut up chemical works at the former spot, in so far as sale at the latter spot is concerned. It is this injury done to the manufacturers, without any corresponding benefit

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to themselves, that forms the real nut which the English public has to crack with the English railway companies.

Not a week passes without some fresh indication of the vivid interest which this question of the cost of transport is exciting among all branches of industry. As to its intimate connexion with the welfare of the building trade we have already spoken on former occasions, and also of that displacement of the centres of activity of this trade which has been shown in consequence of the improvement of the free waterways of the Clyde, the Tyne, and the Wear. On the other hand, we hear from one of the Conservators of the Thames that the transport on that river above the Thames now amounts to little more than one-tenth of what it was twenty years ago; and that notwithstanding the outlay of 100,000*l.* by the Conservators on that part of the river. How far continued activity of the Conservators is called for, the destructive floods that have devastated this fair valley not so very long ago bear witness. But the income of the Conservators depends on the traffic. The traffic has been strangled by cutting off the through communication, which was formerly afforded by the Oxford, the Coventry, and the Birmingham canals, between the Thames, the Trent, and the Mersey. The control obtained by the London and North-Western Railway over the once rich and active Birmingham Canal, and the purchase of the Ashby-de-la-Zouch Canal by the Midland Railway, have blocked the connexion between these rivers. The income of the two former canals has fallen, in consequence, to about one-fourth of what it was in 1830. The Thames itself is a fellow-sufferer. And of the enormous increase which we lately chronicled of building on the banks of the northern rivers, how much, let us ask, has been driven by the obstruction of the waterway from the valley of the Thames?

The physical advantages which England offers to the manufacturer are, first, her mineral wealth, in which she is not unrivalled; and secondly, the easy maritime access to her numerous ports, in which she is without a competitor,—speaking, of course, of the whole United Kingdom. For inland railway carriage England is, and probably always will be, at a disadvantage as compared with many parts of the Continent. Her railways have cost half as much again to make, and cost considerably more to work than most of the Continental lines. Thus, as far as railway carriage is relied on, the Continent has the advantage. But in so far as we can bring the sea inland, make our rivers and canals free, or carry the imports from our coasts inland at the least expense,—in so far do we strengthen the natural economical defences of the kingdom, and fortify a position which is in some respects unique.

Most unfortunately the railway managers have taken a view of the mode of working their lines which is diametrically opposite to the idea that her maritime facilities are the great stronghold of England. When coasting trade exists between two points also connected by railway, the companies carry between such points at fares calculated to compete with the sea passage, although it is certain that little if any profit can be thus obtained. But where a town is some little way inland, and is dependent on railway communication, then they strain their charges to the utmost legal limit. It may be questioned whether this is really a paying policy for the railways. It is certain that it is a losing policy for the country.

To meet this great difficulty by the purchase, on the part of the State, of from seven to eight hundred millions worth of railway capital, is, we hold, quite out of the question. But there is another step which is within our power, and to which we think that the efforts of reformers might be successfully directed. Eight hundred millions would not be enough to purchase our railways. But twenty millions would be enough to purchase our canals, and, when the key lines are held by railway companies as before indicated, that sum would also provide for the construction of new links of water-way, in lieu of the obstructed lines of junction. The construction of from thirty to forty miles of new canals would at once put in connexion the Thames, the Severn, the Nene, and the Trent. A return to former prosperity would at once commence. So certain is this, that we do not doubt that it will be before long taken in hand. But what we are anxious to see cared for, is not the canal interest (except as a means to an end), but the productive interest. We want to see the canals not only navigable, but free. The present is the moment at which to take this in hand. If the canal companies, aided as they will be by the Chambers of Commerce through the country, fight the battle high-handed, there will be the spoils of the victory. When dividends rise from 2½ to 25 per cent., there will be all the stronger disinclination on the part of the canal companies to part with a property of such enhanced value. It is now that the bargain is to be made. It could be made by the assent of the parties interested, instead of, as in the case of the railways, by compulsory purchase. Let a great central committee, with a large guarantee fund, be formed for the purpose of opening our inland navigation free for ever to the public. The success of such a body in removing the obstructions now caused by the railway companies might be delayed, but must be ultimately certain. The Railway Commission, if the recommendations of Mr. Ashley's committee be carried out, will have power to enforce it. There will be the alternative of the new canal lines, if the contest be unduly obstinate. But as a part of the bargain, let the canal owners fix *now* the price at which they will sell the property. The influx of traffic will be certain to provide the means of purchase, on the behalf of the committee, for the purpose of free navigation. But if the bargain be deferred till the canals are actually open, the nation will have to pay five times as much to obtain the permanent freedom of its water-ways as would now be joyfully accepted by the proprietors of our canals.

The main question between ourselves and those railway managers and advocates who have come forward in defence of the present system, including low mineral freightage, and low rates wherever sea passage competes with railway passage, lies in a nutshell. They say, a little profit is better than none. We say, that entirely depends on what is the preliminary expenditure incurred for the purpose of securing this little profit. Take a line which has cost 26,000*l.* a mile, and which has a gross traffic in passengers and goods of 2,900*l.* per mile per annum. Such was the case of the French railways in 1877. Bring upon that line an extra traffic of 800*l.* per mile, earning a net sum of only 80*l.* per annum. It cannot be done if it consists of a traffic running at a much slower rate than the existing traffic. The passenger and goods traffic, no doubt, might be increased by 800*l.* per mile per annum, earning 400*l.* per mile net profit, to the manifest advantage of the proprietors. But that is not the question. The question is the introduction of another kind of traffic, conveyed under different conditions, and earning a low return. This can only be done, either by driving off a part of the existing traffic, paying its 50 per cent., or by increasing the accommodation and the capital cost of the line. This latter course we have taken. In 1877 our passenger and mineral earnings were just 2,900*l.* per mile per annum. But we carried besides this 800*l.* of slow mineral traffic. And what was the result? Perhaps,—it is not sure,—we carried 80*l.* per mile net profit more. But it is certain that our railways cost 39,500*l.* a mile instead of 26,000*l.* per mile. That is an indisputable fact. Is there any rational doubt as to its real import?

The growth of railway capital has long been made a subject of complaint and of alarm by many writers. The subject should be looked at with proper discrimination; a growth of capital that brings with it an increased volume of paying traffic, and an increased percentage on the same, as in the case of the French railways, is a growth of both public and private wealth. A growth of capital to the amount of 20 per cent. in cost per mile in nine years, accompanied by a decline in net earning power of capital from 5·56 to 4·67 per cent., which has taken place on the aggregate of seven of the great English trunk lines, is a loss of property, public and private. Any compulsory transfer of railway property would increase the capital (or the annual dividend) by at least 16 per cent., or to 856,000,000*l.* up to the end of 1881. But any operation, involving the transfer of perhaps 20,000,000*l.* of property, that tended to provide England with free inland waterways, would not only allow of the transport of minerals and heavy goods at cost price,—which it is the true point to secure,—but, by arresting the unprofitable growth of railway capital, would afford the only hope that is conceivable of a future reduction of fares and freights. To open our canals will be to cheapen railway transport, as well as to provide means of transport with which railways only compete to their own disastrous loss.

THE SELECTED DESIGN FOR THE GERMAN IMPERIAL PARLIAMENT HOUSE.

THE design of Herr Paul Wallot has been selected by the almost unanimous vote of the jury from among those of 189 competitors, who sent in upwards of 2,000 sheets of drawings. Such is the information as to the result of this great competition which has already been recorded in the *Builder*; there also it has been read that the best German critics agree that in point of originality of character the design of Herr Wallot surpasses all that were placed in competition with it, and that the whole evinced satisfactory national progress since a previous contest in 1872. If the Germans themselves are satisfied, what other nationalities, it may be said, are so far concerned in the matter as to have a right to complain? Perhaps we may reply, most other nationalities, if there is reason for complaint at all. A structure which must needs be imposing by combined magnitude and dignity of purpose in the imperial city of United Germany is an object which will attract the attention and interest of all students and lovers of art, who will always be drawn sooner or later to Berlin by the accumulated treasures of the national museums. It is by no means matter of indifference to such visitors whether a prominent work of architecture which cannot be escaped from is a constant cause of irritation, an offensive obtrusion, or as constant a source of delight. It is a still more serious consideration whether the success in competition of a faulty design may not blind to its demerits in too many cases, and misdirect emulation in other instances, even when it does not vitiate taste. We cannot conceal from ourselves that the authority of success has an influence which is constantly independent of any particularly cautious appreciation or analysis of its conditions. It marks the direction of fashion, at least, if not of good taste; and if good taste will ever survive in the long run, the shorter period of an individual career may seem more prudentially adjusted to the shorter career of even whims of which the vogue will last its time. The services of Germany to science, to learning, to at least the archæology of the arts, have been so preeminent that it becomes a duty to be jealously watchful lest a not very unnatural assumption of consequent superiority in the practice of the arts should be admitted with the tameness which, we believe, has ascribed too liberal a value to German criticism, not only in the arts, but in literature, ancient and modern.

These observations will not read like an introduction to a very highly-pitched note of appreciation of the design which is at present in question; nor are they meant to be such. Sooth to say, with every desire to welcome a great achievement,—"Trojan or Tyrian,"—with an earnest anxiety, indeed, for an opportunity to greet with disinterested applause the successful improvement of still one more of the great national opportunities that within a generation can scarcely count up beyond the place of units, this accepted design for a structure which should be the symbol of some of the mightiest aspirations, — of the progressive achievements of our time,—seems (must the word be said?) unsatisfactory in the last degree; crude and commonplace when it does not deviate into originality to become hopelessly incongruous.

It is, perhaps, right that it should be understood that the present enunciation is purely from the point of view of the architectural critic,—of the devotee of admirable architecture,—so far, at least, a representative of the most numerous class whom architecture concerns. As regards the distribution and assignment of apartments on the chief floor for particular purposes, various apparent anomalies have already received notice; some of these may have their justification in peculiar national habits, and others are open to easy correction, and may be expected to receive it. The separation of reading and writing rooms from the library at the greatest distance possible from each other, appears strange; and scarcely less so the remoteness of the *restaurant* from the hall of session and cloak-rooms for the sake of interpolation between the two most spacious

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committee-rooms. Its position also as ranging with the Hall of Session, Ceremonial Hall, grand staircase, and state entrance upon the transverse axis of the plan, and occupying the very centre of the chief front on the principal floor, is a little suggestive of bathos. Full allowance, however, must doubtless be made for the conditions imposed by the form and limitation of the area at command, and criticism must be content to attach to particulars in respect to which the architect could exercise unshackled judgment and taste.

We are scarcely in the position to form a definite opinion respecting what should naturally be the principal aspect of the building from comparison of the plan with the elevation from the point of view provided. The western front, which is not shown, should be the true façade, though the eastern, of like magnificent extent, has also a claim to be treated with special if subordinate dignity. Central on the west, and facing the site of the future Imperial palace, is the entrance of state, which admits to the grand staircase, and thence on the transverse axis of the building to the Hall of Ceremony and galleries of the Hall of Session. The predominant importance of this axis is manifestly emphasised by the cupola over the Sessions Hall, and then by two other ornamental erections surmounted by colossal sculpture, the least and lowest being central. It is very difficult to understand how these could tell effectually, even at an oblique view from the front,—how they could compose harmoniously with each other, and then with the violently-contrasted square towers at the angles. In what manner appropriate dignity is given to the main entrance, opposite to the palace, and blended with exceptional treatment of the windows which light the *restaurant* above it, is not to be deduced from the materials before us.

As regards the general design, a degree of solidity is given to it by the continuous lines of the basement, only broken by the interruption of carriage-entrances, and this expression is strengthened by the continuous bands between the two lower stories and the channelled masonry of both. But we must demur most strongly to the meanness of the square windows of the ground-floor, which seem utterly inadequate to light the wide intervals between them, and to be not only confined but crushed. They give offence, or, rather, perhaps, challenge pity in the curtain between the towers; but what shall be said of the suggestion of cellar-like obscurity within, which is intimated by the single opening of these distressing proportions in the full breadth of the angle towers, which are indulged above with exaggerated provision for illumination?

The long eastern front of the building has a projecting centre equal to half its entire length; it is marked sufficiently as not being the true or principal façade by the absence of a central gateway or entrance, in which respect, indeed, it is marked, intentionally or not, as subordinated to the composition of the two ends. In perfect consistency with the internal arrangements two large and co-ordinate portals indicate provision for admission of the outer world in two distinct streams to communicate with diverse classes of the necessarily multifarious offices. We are therefore plainly at the back of the building, and only at the back could the dead flank walls of a projecting centre be otherwise than repugnant to our sensibilities. And yet does this projecting centre receive such exceptional treatment as to imply an anxiety and an endeavour to mark it with distinguished emphasis. The line of general cornice of the building is broken for once to introduce columns flanking a large window opening, rising as high as its corona, and sustaining an independent entablature and thereon a pediment. This feature,—a pedimental form,—unknown on other sides of the building, is introduced again over the window below, and also over each of the side portals. Variety, at least, is proffered to us by segmental pediments attached to the *quasi*-cupola above, which comes most closely into composition with this front. Finally, at each angle of the plan of this cupola rise piers of channelled masonry, which certainly claim kindred in distribution with the great angle towers, but they are surmounted by pinnacles or pyramidions or obelisks, which neither in function nor outline manifest analogy to any other feature whatever in the entire building.

The general cornice which, but for one surprising interruption, seems to run entirely round the building, does its very best, and certainly contributes importantly to promote a semblance of true structural coherence, but not without provocation of a protest. It shows consistent relation to the lofty windows of the towers and intermediate centre as expressing a well-proportioned height of the apartments so liberally lighted; but as it is continued it throws us upon a perplexing doubt as to what can be the interior application of the dead interval above the smaller windows which far more than equals them in height. Does it really represent the height given to the rooms between top of window and ceiling? If so, they will be of very anomalous proportions indeed. If this incongruity is avoided, how else is the space disposed of? Let it be disposed of as usefully and ingeniously as it may, the offence to the spectator from without remains the same; the design fails to explain itself to him lucidly and satisfactorily. This is an aggravation of a general failure in harmony of composition or something more,—of a violent breach of that well-ordered gradation which is as essential to dignity as to grace,—most of all indispensable when, as in the present case, the requirement is for dignity to assert itself under the conditions of gracefulness and sympathetic combination.

Free columns will always dominate pilasters with which they range, but surely they might be more happily introduced than as we see them on either side of the large windows of the angle towers, raised upon advanced rustic piers, then mounted on pedestals and surmounted by a segment of entablature, and owing an excuse for their existence after all to a statue at top, some 70 ft. above the eye.

The side fronts of the building, so to call them, on its longer axis, are treated so similarly, and in themselves so symmetrically, as to present themselves as proper fronts composed of centre and uniform wings; they give, in consequence, no intimation whether the true front of the great structure is to be sought to the right of the spectator or the left, or whether, indeed, the true front may not be already before him.

The wide and lofty windows of the towers at the angles range and correspond in proportions with those of the central division of the intermediate curtain over the gateway, an agreement which inevitably suggests a certain correlation,—but a suggestion that is as immediately baulked. The quoins and channelled courses of the towers which are continued from the basement to the general cornice give an appearance of a solidity which is not greater than demanded by the extraordinary superstructure, but which oppresses and threatens to reduce to triviality the intermediate screen,—the central compartment included.

The four smaller windows on either side of this are in such sudden contrast in respect of size, that, whatever their sufficient absolute dimensions, they seem only worthy to light passages of communication between such apartments as the three great windows imply,—apartments which, it must be said, even so present an appearance of unsocial isolation. When we refer to the plan of the chief story, we find that the two small windows to right and left of the centre do, in fact, belong to the apartment which is lighted by the large window, and the suppression of any intimation of that fact on the exterior seems gratuitous sacrifice of an opportunity for expressive composition. On the north front three of the four windows on either side combine with the large central window to light the library, but apparently their treatment is the same as on the south.

It cannot be said that the range of smaller windows possesses any dignity that would be materially affected by reduction of multitude. Each series of four has an allowance of only three pilasters, with the result that a terminal window at either end seems crowded into its corner against the angle of a returned wall to the great impediment,—real or apparent, it matters little,—of its function of illumination. The omission of a pilaster also in this position,—the open avowal that it may be dispensed with,—conveys an imputation on the member of worthlessness, if we should not say, is a simple confession of fictitiousness in its employment throughout. It is but rarely, indeed, that the pilaster is employed, or capable of being employed, externally with true artistic effect, and of all its forms the pilaster on a pedestal is surely the most obnoxious. A pedestal so employed is the high-heeled shoe of architecture; as derived from the most unlucky innovations of the Roman architects, it pairs off with their broken architraves, which we shall meet with here also before we have gone far. An isolated pedestal has inevitably the appearance of coming to the assistance of a short column that would have done without it if it could. It is interesting to observe in the churches at Cologne, and on the Rhine generally, how the better taste of the Romanesque architects dealt with these sophistications before handing them on for still further modification by the masters of proper Gothic. It is not difficult to trace, by comparison of examples, how a set of mouldings which seem to constitute a super-abacus are, in fact, the remnants of the all but suppressed segment of the Roman entablature. The pedestal is less drastically dealt with, but no less effectively; it is unceremoniously shorn of its cornice, and instead of being admitted as a contrivance to eke out or lift up a column, it is made part of it,—is taken into its proportions and finished with base mouldings, which happily repeat those of the proper base on another scale. The transformed pedestal is thus, as the evolutionists would say, *differentiated* to constitute a fully-developed base, which is peculiarly effective as the dignified support of a cluster of columns or a compound pier.

So little, then, does this design appear to us to be worthy of a noble,—it may be said a secular,—opportunity, that we should be unwilling to accept it as the best that the contemporary German architect is capable of; we would willingly ascribe its selection rather to a previous error in the selection of a committee of judges. Opinions with which we have nothing to do here are at variance as to the position and the promise of the constitutional system of which a German Imperial Parliament house is a natural symbol,—whether it is already in the vigour of youth or scarcely beyond the precarious stage of a hopeful but still imperilled germ. But there can be no difference of opinion as to the momentous historical importance of the events which have culminated in the requirement, to whatever ultimate end, of a seat of concentrated legislation for Germany. It is not, however, as a monumental reminder of the proceedings and sacrifices and achievements by which the union of Germany was brought about that their Parliament House will ever appeal to Germans; far more reverentially will it be regarded as the sacred hearth of those aspirations and energies which realise, by due adjustment of self-assertion and self-control, "the act of order in a peopled kingdom." It is, no doubt, much to demand of an architect that in his conceptions for a work prescribed he should not merely bear in mind the past and present, but even anticipate history, and so provide a structure which shall appear to future generations to have been designed under a consciousness of the diversity yet consistency, the detail yet comprehensiveness, the intellectual vigour, and the moral dignity of the work that was to be carrried on to happy completion within it; and yet it is possible in architecture, as in other arts, for "old experience to attain to something like prophetic vein." Reluctantly, we must confess that our hope for the harmonious consolidation of Germany by Parliamentary action would be but weak if the design before us is to be accepted in any degree as a worthy symbolical embodiment of the self-consistent energy and harmony to be expected from it.

The Lime Process of Getting Coal.—At a monthly meeting of the South Staffordshire Institute of mining Engineers, held at Dudley, on the 5th inst., Mr. W. Farnworth, who presided, explained that the Council of the Institute had been that day to Cannock Chase and witnessed some experiments with the new lime process of getting coal. Mr. Sopwith, of the Cannock Chase Colliery, said the men in the employ of the patentee had been down the pit, and had offered to them the shallow seam to experiment upon. They chose a fair specimen, and, without going into details, he might say that after the lime cartridges had been put in, and the expansion had taken place, some 40 or 50 tons had come down in a solid block. So far as he was able then to say, the trials had been as successful as could be desired. The cost of drilling, &c., would have to be carefully worked out in reference to gunpowder. The coal came down so quietly that the only slack to be made would be that in breaking up the coal for the tubs.

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FURTHER MUSINGS ON THE MERITS OF SOME STYLES OF ARCHITECTURE.

FINDING it impracticable within the limits of one evening to say at the recent meeting of the Architectural Association all that was wished on the above subject, and having in consequence left out some matter which I had written and intended to then bring forward, I have been tempted to supply the following additional observations in your journal.*

Before proceeding with the consideration of any individual style, let me say a few words generally. Mediæval architecture has such a wonderful versatility, that it is difficult to trace to the end the many ramifications into which the several European styles spread in the Middle Ages. To instance only one of its leading features,—groining, the outcome of the parent,—the plain, ribless, quadripartite Roman vault, a form of construction which was carried on into the Anglo-Norman,—this alone is remarkable to contemplate. The children of its maturity may be called the ribbed quadri-partite and sex-partite vaults, and, ultimately, the intricate liernes of the Late Decorated period, culminating (as far as mere elaboration went) in the magnificent fan-vaulting of Henry VII. In the South of France the early barrel and domical vaulting, though thoroughly harmonising with the architectural surroundings, lacked the finish of the late developments.

In Italian architecture there is much variety in the surface of the vaulting, whether in relief or colour, as, for example, in the celebrated stanze of Raffaelle in the Loggia of the Vatican. But, short of the domical and barrel forms, there is not much else to choose from.

Turning to the Gothic treatment of vaulting, there is the indescribable charm of the play of light and shadow, caused by the various sharply-expressed angles of the groining. The style can be most legitimately treated with such freedom as to suit every want, and to adapt itself to circumstances. In another feature the mutability of Mediæval architecture is found,—in wall arcades, sometimes one behind another, sometimes trefoil-cusped, sometimes cinquefoil-cusped, or in other examples with plain well-moulded arches, or in arches of ornamentally-curved forms, practically in one order, but not cusped, as at Durham, Wells, &c.

Or, again, in a window, doorway, a capping to a tower, or a wall diaper, observe the large number of changes each of these features undergoes. It is not only a variation in surface ornament, or a little alteration in the mouldings, but is equally shown in outline, form, and construction.

Mere caprice or eccentricity I except. The Mediæval men were too faithful to the true principles underlying all that wondrous manipulation of the vernacular architecture, as I may truly call it, to often diverge into such paths. And this versatility extends through those great English Mediæval styles which may broadly be called the Early English, Decorated, and Perpendicular, though the latter of these three has more sameness than the architecture of the two earlier periods.

In the timber roofs is another great charm of the Gothic era; first, the rude tie-beam construction, then the trussed rafters, the king-post, the magnificent hammer-beam treatment, or the moulded and cambered tie-beams with rich perforated panelling over, or the cradle ceilings of Somerset and Devon. I cannot but just mention a few other details in which a like beautiful variety exists: the fonts and pulpits, for example, particularly noticeable in the former, of which so many interesting specimens have fortunately been handed down to us, after having been the appointed means of inducting so many babes into the Christian fold; or in the tabernacle work of shrines, tombs, and niches; in canopies to stalls; in the plan of piers; in that beautiful Gothic feature, the flying buttress, with its useful as well as elegant pinnacles; the carved spurs in Norman and Transitional bases; the crocket and finial exquisitely carved; the gable crosses, the barge-boards, the pierced parapets of many a different design, the corbel tables, the brick moulded chimney-shafts. All these features present to us many beautiful changes, but yet do not represent a tithe of the wealth of resource in Mediæval work.

In the smaller, though none the less important, details, such as, in churches, the sedilia, the aumbry, the credence, the piscina, it is rare to see one like another. In our modern work, probably owing to less time being bestowed on it, there is much more sameness.

Although, as that sagacious authority, Mrs. Malaprop, has remarked, "Comparisons are odorous," I cannot resist jotting down some few notes on the idiosyncrasies of Classic architecture. I have not yet mentioned window tracery in the foregoing remarks on Mediæval architecture, undoubtedly one of the finest characteristics of its best period, where the Italian style is notoriously at a disadvantage. But, of course, in the Veneto-Italian style, to be presently noticed, some of the palaces exhibit the yearning after this lovely feature, which, however, never developed further than the simple principle of two semicircular-headed lights under a semicircular arched window carrying a circle. The Piccadilly front of the Museum of Economic Geology is a good example of this; in fact, the whole building is an illustration of chaste Veneto-Italian design, severe possibly to a fault, but how superior to much of the bastard stuff foisted on the public (who, I fear, like it only too well) nowadays as "Free Classic," of which the reputed mother, which produced a Michelangelo, a Palladio, a Scamozzi, would have felt ashamed!

There is an elegant feature in Italian architecture, if skilfully treated, — the Venetian window. But supposing the same idea were attempted to be carried out in a Gothic mullioned window, the effect could scarcely be satisfactory,—that is to say, in Domestic work. In fact, I hardly remember a Mediæval example where the centre light is wider than the others, though in ecclesiastical architecture, in the case of traceried windows, it is not so unusual, and is sometimes of advantage for the working in of the tracery design of the head.

In the more severe phases of Italian work there is not much variety in the balustrades. There seem to be about three species:—(1), the ordinary bulbous form; (2), the double-bellied baluster; (3), the baluster square on plan, though bulbous in elevation. But in Renaissance work a little more play of fancy in this particular respect is found. There are miniature pilasters in the place of balusters, or geometrical devices consisting of circles, lozenges, frets, &c.; but, like window tracery, the mutations are very limited as compared with those of the great Gothic field. The rustication of the basement or lower stories of a building is one of those details of Classic architecture for which we search in vain among Mediæval examples,—it does not seem to exist, the parallel is wanting. The courses of masonry may be deeper, the surface less finished, the reveals of windows and doorways more profound, the openings narrower and smaller, the mouldings plainer,—in a word, the whole construction more massive. But in other respects the distinction of treatment between the lower and upper portions is not so great.

There is one detail in the later developments of Italian architecture in which it is difficult to see any force or any object,—far less beauty. I mean the box-like blocks of stone, sometimes vermiculated, "hung," so to speak, round detached columns. To a man who reverences Mediæval architecture the notion is given of the work being half done and left unfinished, or as if a square block, called in the euphemistic language of Chambers "a rustic cincture," had had a round hole cut in it, and the attempt made to slide it over the cylinder, but with so little effect that it stuck half way. How it ever can have been considered a recognised and legitimate feature in the style seems a puzzle. The Gothic zone or band has, in this respect, a great superiority. In Italian and Gothic architecture it is remarkable how very different in proportion are the columns. In the more severe Italian their height is "cut and dried," and it is only in the Renaissance and Elizabethan times that less rigour came to be observed. Consequently, bands or zones were never actually required, though sometimes added, and then the length of the column beneath them fluted, or decorated with sculpture. But it is not my intention to traverse the whole ground of Classic detail, and I must briefly conclude this branch of the subject. There is a certain coldness and stateliness in Italian architecture which seems naturally to appertain to its symmetrical order of things. Whereas Mediæval work is warmer, less formal, on account of its not infrequent irregularity, though when occasion demands it, it can, as we know, don very stately robes, and be a match to its severe elder sister. Mediæval architecture is home-like, as may be well illustrated by studying the effect of a labourer's cottage carried out in this style. In Italian architecture it is difficult to conceive any building less humble than the entrance-lodge to some gentleman's park.

The many beauties of the Italian-Gothic style have been ably treated of in the "Brick and Marble Architecture of North Italy," as well as in Ruskin's well-known works. Yet, happily, there still remains much that might be said about that style. Among its conspicuous merits I may certainly instance the natural treatment of terra-cotta and brickwork; the extensive use of various beautiful native marbles in decorative features; and last, not least, the glorious enrichments in mosaic and fresco. The employment of alternate bands of warm-tinted stone and brick, and a like treatment continued in arch voussoirs, gives much variety of tone and colour to Italian-Gothic work, having a special charm to the traveller from a less sunny land. So, when the passion for this style was raging a few years back, this characteristic of North Italian was translated, only too frequently with but indifferent success. For the colours of the two materials ought, to a great extent, to be assimilated and so brought into harmony, and thus prevent a "bizarre" look. In these Mediæval examples, too, the gentle hand of Time has done much to bring into tone the diverse tints, not only in Italy but in many other countries. If a creamy yellowish-looking stone is used, with a good deep red brick (not bright red), the effect is good and harmonious. The contrast must not be only in one place, but spread over a large area, so as to give "breadth of effect" and avoid "spottiness." It is unfortunate the English language does not contain better words to express what is meant in this respect, so I have no resource but to explain myself by the usual cant phraseology.

The same principle prevailed in Italy as existed in our Late Perpendicular period, where large surfaces are monotonously, whilst ornamentally, panelled. Yet this great repetition of panelling actually looked less fussy than in other buildings, where there was abundance of plain wall surface, but no judicious manner of utilising it. While on the subject of panelling as a means to sometimes break up and greatly enrich a plain surface of wall (a thing often desirable, as at the east end of a church), I would instance, as very suggestive, the effective treatment that exists in the apse of the Duomo, and also at San Fermo, Verona. In this case diaper-work would have been too rich, and the long narrow pilasters of shallow projection which occur are scarcely further apart than the width of each pilaster. These support semicircular arches, but it is almost needless to say that the pointed arch is as equally applicable as the round for such features. There is a beautiful object in North Italian Gothic work which does not exist in old English architecture, the stone balcony supported on boldly-moulded corbels or cantilevers. The balcony exists in many modern Gothic examples, as in the new buildings, Christchurch, Oxford, the style of which, however, is decidedly very suggestive of Italian Gothic. It is difficult to understand why, in Mediæval times, the balcony was not adopted. Though our climate is unfavourable for sitting or standing out of doors for any length of time, there are yet days when it would be a pleasure to thus make use of a balcony, especially to those who like a whiff of the fragrant weed. At any rate, flowers or shrubs, with an æsthetic blue pot or two, could be put here with excellent effect, both pictorially and architecturally. When the sun shines an agreeable shadow would be cast, giving a sparkle and crispness of effect to the elevation or façade, preventing any appearance of tameness or flatness. It is easy to guard against undue shadow to the windows beneath by making them rather larger, or, perhaps, by obtaining a greater amount of light in other walls. Such an adjunct suggested by North Italian architecture could be very suitably made use of without any misgivings.

The Certosa, near Pavia, is one of those buildings which an architectural purist might, in cold blood, condemn, if he only judged of it from illustrations. But let him see the wonderful façade and general *ensemble* under a deep blue Italian sky, with all the beautiful variety of different coloured marbles, delicate arabesques, and decorative sculpture.* What, then,

* See vol. xlii., pp. 510 and 559.

* See view published in the *Builder*, p. 208, *ante*.

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becomes of his strictures? Judging from my own experience, I can speak feelingly, and opine that one's condemnation is very prone to vanish! Nevertheless, it cannot be denied that a cardinal rule of true composition has been transgressed in the principal façade, where the lower stages are more ornamental than the upper. The Englishman, accustomed to the greater ruggedness of our Northern architecture, and finding the surroundings of the Southern clime so different, is very apt to treat as a matter of course this and other divergences from the rules laid down as proper in architecture, forgetting that such axioms are equally applicable in every country, and that it is dangerous to give way to licence. History is said to repeat itself, and one of the worst blemishes in Italian Gothic is continually now being introduced in another very different but, alas! debased style, the so-called "Queen Anne." I allude to the way in which architectural features, whether constructional or ornamental, are stuck on to a building, instead of being bonded into it. Late Pependicular work was bad enough in this respect, as can sometimes be seen even in counties like Somerset, where splendid building stone was to be had almost at the door. But in those localities where freestone was scarce, there is, but too often, hardly any bond at all, and a width of only 2 in. or 3 in. at most between the termination of the mouldings and the end of the face of the stone. In the Perpendicular period, however, the further enormity, now so common in the "Free Classic" style, of projecting architraves and other members attached to a building just like joiner's work, was rarely perpetrated.

The use of coupled shafts is not peculiar to North Italy, but is, perhaps, a more characteristic feature there than in any other country. There are two modes in which they are arranged, *i.e.*, either side by side, their axis parallel with the face of the wall; or with the axis at right angles with the thickness of the wall. The west façade of San Zenone, Verona, contains, in the curious "wheel-of-fortune" window, a good specimen of the first named treatment. It appears to me that in those instances where a substantial wall is desired, and the walls, perhaps, are thin, owing to want of funds, the former treatment answers well, and takes away any semblance of poverty-stricken architecture.

In the interesting Church of Santa Eufemia, Pavia, there is a pretty though not very common feature, that of the shafts set at the angles of the octagon turret or tower, which in effect help to carry the corbel course, thus pleasingly and most appropriately connecting it with the substructure. The shafts in this instance project, the rest of the turret wall between each shaft constituting the panels, as at San Gottardo, Milan. In the latter instance, however, column rests on column, but there are corbels between the upper range. The columns in the second range (counting from the top) rest on a set-off. The angle shafts are detached, but need not necessarily have been so.

Another very characteristic North Italian, as well as German Romanesque, feature is, of course, the arcade following the rake of the gable. In Milan and its neighbourhood, it is a feature of the tile-covered spires to be elongated cones, or circular in plan. From a practical point of view, this has the advantage of having no angles, or weak points for rain to get in; but, on the other hand, the octagonal spire, or the square-planned pyramidal capping, has much more vigour, and certainly better suits our climate. How fortunate that during the rage for Italian Gothic architecture, no enthusiast ever thought of transporting this to our country!

There is a peculiar detail in this same style of architecture which also, curiously enough, exists in another very different country,—Ireland,—the return of the jamb mouldings round the window-cill: an irresistible reminder, as it appears to me, of an Italian (Classic) door or window panel. For many reasons it is advantageous to have a deeply-splayed, or at least a flat-weathered, cill, to throw off the wet, something which shall not harbour dust, or water to be frozen up,—something firm and substantial, on which the jamb mouldings can plant themselves. There is yet another advantage in the plain splay,—the pretty way in which the mouldings die into it, and elongate their sections,—a feature which is also effective in jambs where the arch-mould stops on it in what is termed a "discontinuous" manner.

In concluding this short review of this particular style, I must not forget to mention the remarkable intarsia woodwork of the latter part of the fifteenth century, which is of great beauty. There really seems no reason why such a species of ornamentation should not be more used in England, as has been essayed with much success by the late Mr. Burges in Worcester College Chapel, Oxford. But great care must be taken not to introduce this parti-coloured ornamentation into a building where the walls are left uncoloured, the roof or ceiling undecorated. In such case the inlaid woods would appear out of place, out of harmony and tone with the surroundings. I believe that the variety of different colours in Tunbridge ware is from the tints of various naturally-coloured woods found in that neighbourhood. Owing, however, to their generally being squares, the effect has neither the variety of mosaic tesseræ, with their irregular cubes and thick joints of cement, nor that of the intarsia work of North Italy, where the inlay is in all varieties of curved, straight, or other forms, and of every size.

Since the use of distemper, mosaic, or tiles has become so usual in England, while the ceilings are coloured by artistic hands, and while Roman mosaic or handsome encaustic tile pavements cover floors, why should we be content with only oak or walnut fittings,—I speak more particularly of churches?

By no means let the characteristic features of well-moulded bench-ends, &c., be abandoned. Let them remain so, with the addition of employing different coloured woods, or inlay, as the case may be. Such examples exist among us, but might, I venture to think, become more common.

The last style which I propose to treat of may be said to be almost the mother of Gothic architecture. In the East, where the sun rises, and where true believers consider the very earliest historical memories spring, from near the garden of Eden, from the East, appears to have sprung the germ of that grand style which, apparently founding itself on Classic models, stayed not there, but went to an earlier source, and with such nurture produced the magnificent and never-to-be-eclipsed works of the Middle Ages.

Fergusson* has drawn attention to the remarkable Gothic feeling of some of the work in Hindostan, which he attributes to the fact of the natives, some time after the Mahometan conquest, imitating the architecture of their conquerors. Few architects, however, have been able to travel there and investigate the matter for themselves, and their judgment has probably been formed by having seen some of the fine photographs published by the Government, or by other illustrations. There is, however, a very good substitute for a journey to India, and that is a journey to South Kensington, to the India Museum. The magnificent and extensive collection there is apparently not so much frequented as its very interesting contents deserve. At present the unpromising makeshift appearance of the exterior rather deters people from going in; and when one enters at the so-called principal entrance, such a series of tortuous passages, some almost underground, and so many twists-about, make a visit to the collection a tiring one, as the objects to be looked at are so far away to reach. No doubt, in time, when some grand building springs up to shelter it, the public will find out the Museum more easily. Casts, though not giving the time-worn colour and texture of the original details, have yet the merit of affording an absolutely faithful reproduction of the contour of the actual work. A drawing may not be truthful; a photograph, owing to the particular light or focus in which the view was taken, may not exactly give a right impression; and in either a photograph or drawing, *scale*, with the exact relief, cannot be represented. Casts have none of these disadvantages, and both in the Architectural Court at the South Kensington Museum and at the India Museum they exhibit exact copies of some of the largest details. The "bracket" capital, which is considered to be of a very early period, far before the development of the generally-recognised capital, is a great feature in Hindoo architecture. There are some good specimens of it in this Museum. A large part of the ornamentation is barbarous and overlaid, with scarcely an inch of plain flat surface, so that much is frittered away in crowded detail, giving the tired eye no rest. A characteristic specimen of this kind of thing exists in the magnificent entrance archway to the great tope at Sanchi. There is no attempt, apparently, at any real architectural composition, but only an array of superimposed detail, in which, by-the-bye, the relatives of Jumbo figure very largely in all kinds of attitudes, the elephant being in the East one of the most important animals for many purposes, whether for regal state or other uses. On the other hand, as has been not infrequently remarked, how much exquisite refinement and delicacy is found in this Indian architecture and sculpture! The ornamentation of the Runic, the Romanesque, and the Norman is foreshadowed when we examine some specimens from the Amburath Temple, for example. Of the latter type there are some very beautiful examples in the temples at Bhuvanesvara (commencing with the seventh century A.D.) of ornament designed in a serpentine manner, teeming with animals and birds. In fact, in these temples there is much most worthy of attention, if one can form an opinion from these excellent casts. In the ruined city of Saitu is some foliated ornament (of about A.D. 1100) which is quite Renaissance in character, while some of its detail more resembles Flamboyant work. In specimens of Hindoo architecture of the tenth century, the characteristic ornament of our English Decorated style, the four-leaved flower, occurs most unmistakably; and in examples of the eighth century, the Tudor rose, four-leaved or petalled, has been anticipated. One wonders how it came to pass that, while the ornamentation is frequently barbarous and rude, there is never any vulgarity. I suppose the best reply is that the Oriental imagination had an innate spirit of greater refinement in architecture or art than that of the inhabitants of Europe. The female figure, always draped, is very frequent in these Indian sculptures, posed in attitudes which are apparently meant to be very attractive.

At the ruined city of Saitron Rajpootana is a freely-treated example of an ornamental arch, sept-foil cusped, of about 1100 A.D. Fergusson, I may say, remarks on the trefoil arch in Hindostan, and appears to think it was indigenous, not copied from elsewhere. There are also some casts from the Amburath Temple, Bombay, which are extremely Mediæval-looking,—a patera or boss, for example. In the architecture of Cashmere there is a strong Greek feeling, so that we seem to find characteristics of many styles in India. The magnificent topes and tombs of Indian potentates are proverbially famous. As happens in hot climates, where water is so grateful and precious, much attention was paid to conduits, wells, and baths. There is an extraordinary model in the India Museum, to a large scale, of the grand staircase, or rather series of flights of steps, leading down to a well, which is quite a magnificent architectural feature, most unlike anything existing in Europe. In pavements, the encaustic and glazed tiles are, in texture and general appearance, much like Mediæval ones, though in the general tone of colour green is more predominant, rather than red and buff.* B. EDMUND FERREY.

* I shall have occasion more than once to refer to this great authority on Hindoo art, but will just premise that what I write was not suggested by Fergusson's work, but is merely the opinion of one who has not made this style a study. So I can only pretend to lightly skim over its surface. Indian architecture is certainly distinct and widely different from other styles.

PROGRESS OF THE MINOR ARTS IN ENGLAND.

WRITING upon the subject of the progress of the so-called minor arts in England of late years, Herr Zimmern, a German critic, gives, upon the whole, a very favourable report. He is more particularly struck with the changes that have been taking place in the style of fitting up of the ordinary sitting-rooms of English dwelling-houses. It is, he says, an undeniable fact that, within the past fifteen to twenty years, a lively interest has been awakened in this country in all the arts contributing to the adornment of our living-rooms. Upon this subject many books and treatises have been written, many lectures have been delivered, and numerous models published to the world within that period. The rooms of English dwelling-houses, almost without exception, show a total change, and on the whole it cannot be denied that their interior has been

* To be concluded.

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considerably improved. Not so very long ago there was no room left for free choice in the character of our internal fittings and ornamentation, but now it is quite within our power to indulge our personal tastes, to carry out new practical ideas, and to gratify our desire for variety. The walls of our rooms are no longer, as formerly, pasted over their entire surface with one and the same pattern of paper. Who does not remember the unpleasant effect that used constantly to be produced by the repetition of the same glaring or tasteless wall-paper perpetually forcing itself upon the eye,—a pattern which had been known ever since paperhangings had come into existence, and which had to be endured from the difficulty of obtaining anything better? This, which was formerly a necessary evil, is so no longer. In England we have at length arrived at the conviction that wall-paper ought to be regarded simply as background. Hence we have softened its tones; we have made the figures upon it less distinct and less prominent, and we avoid the mistake of making the colours of the ground and of the figures different or inharmonious. Patterns with a white ground have almost disappeared, and dark-toned blue and green are more and more coming into vogue. But this is not all. A new arrangement is now made with the surfaces of walls,—they are divided into two divisions horizontally, and the lower portion is decorated differently from the upper. The original idea in this division appears to be that of the old panel,—that is, a protective covering for the lower parts of the wall by wood or some other material not easily injured,—and such, in fact, is the object the new arrangement is calculated to attain. For this purpose, matting of various patterns and colours, consisting of plaited straw or cocoa-nut fibre, is very popular. Another frequent material is pressed leather and various imitations of it. If these imitations only prove durable, they may be regarded as perfectly adapted to their purpose. If they turn out to be, not simply in appearance, but also in wear and quality, at all comparable to leather, they will be sure to gain ground. This material, which is a kind of oil-cloth, avoids the ordinary defects of oil-cloth, and is not covered with mosaic or carpet-like patterns of figures. It is produced in simple colours, quiet and pleasing to the eye, and deserves to be more generally used. However, with regard to the lower portion of room walls, it is commonly the fashion, although many artistic authorities place their veto upon the practice, to cover it only with paper of a pattern different from that on the upper half. It is still a matter of dispute whether such an imitation of a panel or dado in a dark tint does not offer a practical advantage, and whether, apart from this consideration, it is not artistically defensible on the ground that it serves to break the monotony of a large surface of wall. With regard to walls of small dimensions, however, it cannot be disputed that they would be better without any such break or division. Unfortunately, the builders and decorators of small houses are precisely those who are most inclined to a slavish imitation of the prevailing fashions, and so the panel-like divided walls are seen almost everywhere in small rooms.

With respect to the woodwork in the interior of houses, a considerable improvement is to be reported. Instead, as formerly, of endeavouring to impart to it a painfully-elaborated similarity to some more valuable kind of wood, woodwork is now either painted so as to harmonise with the wall-paper, or it is simply stained and varnished. The mouldings and surroundings of the fireplace are now almost always in wood, and in many houses are also painted or stained. The fashion of staining wood instead of painting it is gradually leading to the adoption of better kinds of wood, while formerly deal was exclusively used. The beauty of the natural grain of different kinds of timber is being more and more recognised. It is certainly a sign of progress that the practice is on the decrease of painting one kind of wood so as to resemble another, of making mortar look like marble and oil-cloth like mosaic work. Still the change is only going on so gradually that the observer, when he sees the odious old patterns constantly turning up again, often feels tempted to believe that their supposed decrease is only imaginary.

The custom of covering floors with fixed carpets, which was formerly universal in England, is now no longer invariable. The innovation, to which an exaggerated importance is attributed by the writer, as contributing to health and cleanliness, has, of course, necessitated greater attention being paid to the quality and appearance of the wood of floors. Carpets are now being employed of designs adapted to the apartment, and the English eye is becoming accustomed to the patterns prevailing in Oriental carpets. This improvement in taste is also producing its effect in the carpet factories of the country, and the harsh and glaring contrasts which once prevailed are giving way to more harmonious patterns and more appropriate combinations of colour. Although, as part of the wooden flooring is now allowed to be visible, more attention is paid to the timber employed, yet oaken and inlaid floorings are still rare. The ordinary deal planks, of course, look poor, and they are accordingly being stained, and inlaid work is being introduced, of elegant and durable workmanship.

The changes which have of late taken place with regard to fireplaces and mantelpieces are even greater than those in the floors and walls. Low square grates, a covering of glazed tiles, and a low simple fender, are now used in place of the old high round grates, with black or black-leaded sides and high fenders. The glazed tiles are in every way to be recommended. They are, or might be, pretty. They are easily cleansed, and they throw the heat back into the room. Like everything made by the hand of man, however, this form of decoration can easily be made ugly. Not a few of the so-called artistic tiles used in new houses might serve as examples of what ought to be avoided in this department. The low and simple fender is worthy of all praise, whether it consists of brasswork or of a stone border. The reintroduction of wood as the material for the chimneypiece has produced a sort of revolution in large houses. Artistic decorations, often models of the fifteenth and sixteenth centuries, are everywhere to be seen, and they are often of such dimensions as to reach many feet above the chimneypiece itself. Of course, the value of these productions is very various. Very recently they have begun to be overloaded with ornamentation, a fact that is not altogether satisfactory.

In the case of curtains and blinds, the same change of taste is making itself felt as we find in the carpets and paperhangings. The figures are less prominent, the tones of the colours are less glaring or definite. Pale green or brownish nuances have taken the place of white. This replacing of the glaring white by other and softer tones in the new fabrics is a characteristic mark of the change of taste in the decoration of rooms. The furniture in the English living-rooms that have been thus revolutionised likewise exhibits a different character. What is most noticeable in it is its greater simplicity, a larger variety, and a departure from the rigid symmetry of former days. The heavy table that used to occupy the middle of the room was first pushed to the side, and finally got rid of altogether. The return to old forms, and a suddenly awakened interest in the products of Japanese art, have resulted in producing an immense multiplicity in the forms of chairs and tables. Wooden chairs are now straight and square. Arm-chairs, or easy-chairs, are now formed of every conceivable shape. Basket work is increasingly patronised, and *chaises longues* and small work-tables and tea-tables are becoming more numerous. Instead of the unavoidable old chiffonier, elegant bookcases and cupboards are now to be found. In their chief lines they are mostly simple, but if, as frequently happens, they are imitations of Japanese original work, their two sides are often dissimilar. The panels are sometimes adorned with paintings, but the latter are subject to a modification or transformation, which is likewise attributable to Japanese influence. The idea hitherto prevailing in Europe of a regular pattern placed in the middle, which has been handed down to us, not from Greece, to which it is often attributed, but from the Byzantine style, which, of course, itself sprang originally from Greece, is diametrically opposed to the Japanese principle. The art of Japan shows an aversion to symmetry and repetition. For example, instead of decorating a plate or tea-cup with the traditional wreath of flowers round the edge, and with a single flower placed uniformly in the centre, it will ornament such articles with an irregular end of a twig or branch running across from the circumference on one side to the other, and suddenly breaking off at the boundary line. This new idea has been taken up with avidity, and there are few branches of English art in which its influence is not be traced. Fortunately it has not extended to the carpets and paperhangings, for, as these are naturally only background, figures of the kind we have described would be entirely out of place in them. Upon the whole, the Japanese influence has been most salutary, particularly from the fact that it has diminished the inclination to constant mechanical reproduction,—a tendency which has been fostered by the high estimation of symmetrical form, coupled with the development of machine work. Japanese taste, however, like Byzantine, has its dangers, and the English artist and artworkman, although subject to both influences, has not yet attained to the well-proportioned achievements of the Greeks, whose products observe the due mean between total disregard of all symmetry, on the one hand, and a mechanical uniformity on the other.

The cause of this interest in everything Japanese which has been awakened in England simultaneously with the revival of fashions prevalent here a century ago is to be found in the introduction of the Japanese wall-screens. This, perhaps, more than all the other changes, has contributed to give the new character to our dwellings. By help of a high movable screen we can produce numerous changes in the appearance of a room. The form of it, the light, and its fitting up may all be modified by a change in the position of the screen. The monotonous quadrangular form of most modern rooms is advantageously broken up by these intervening walls. They offer the charm of snug and cozy corners. Next to the banishment of the large central table that used to take up far too much space, nothing has so greatly contributed to render reception-rooms comfortable as the introduction of these wall-screens. Moreover, their own surface affords room for tasteful decoration, which in importance is hardly second to that of the room-walls themselves. In most cases the screen surface is made of some textile fabric, but sometimes of paper. Very recently the fields have been occasionally formed of wood-carvings in open-work designs. This latter species, which re-reminds us of Moorish wood and stone work, is often very effective in appearance, but the object of the screen to protect from the heat or draught cannot, of course, fail to suffer much under this style of ornamentation. For small screens, coloured glass has often been employed of late. With appropriate colours, like the deep blue of peacock feathers, which is mostly chosen, these screens look very well, but their weight tells against their general adoption. The prettiest, and at the same time in every way the most handy, screens are those consisting of a bamboo, cane, or some other light frame hung with Turkish silk. Few articles would, ten years ago, have filled an ordinary decorator with greater astonishment.

Considerable as has been the deviation from the old paths in regard to the furniture and fittings of our living-rooms, the new tendency is everywhere far more observable in the case of objects of a purely ornamental character. Pottery in particular has developed itself in England to a degree never yet attained in Germany. The Lambeth firm of Doulton has founded a new branch of this industry. In this pottery-ware articles of all degrees of quality are represented, from the commonest stone jugs to the finest and most splendid vases. The articles for which the firm in question are celebrated consist of a finely-glazed earthenware, whose ground colour is blue or brown, which in most cases is not uniform, but in various shades. This ground is ornamented either with figures incised, or in relief, and sometimes with a combination of both. The forms are exceptionally pure and classical, and the lines of the ornamentation are mostly worthy of the form. Amongst the most charming are the outlines of animals on a brown ground. As we hear, they are from the hand of Miss Barlow. The elevated ornamentation consists frequently of lines formed of fine pearls, which describe exceedingly pleasing arches and patterns. Sometimes the reliefs represent shells, flowers, or animals. Some of the larger articles decorated in this way remind one, though with important variations, of the strange Japanese vases only recently imported into England, upon which birds and flowers are represented in the strongest high relief with the most perfect fidelity. The art products of Messrs. Doulton are by no means limited to the earthenware articles bearing their name. Glazed tiles are

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also manufactured at Lambeth, and some of them are very beautiful models. Paintings on porcelain and tombstones are also among their productions. The plates of the latter, painted by hand, are not up to the level of the other art products of the establishment. The generally high standard it has attained is in no small degree attributable to the influence of the Lambeth School of Art, where many of the artists employed by Messrs. Doulton were educated. This firm, on principle, allows the greatest practicable freedom to the individual taste of those who furnish the drawings, some of whom, like Miss Barlow and Mr. Tinworth, have acquired a well-deserved reputation of their own. Their terra-cotta tablets in high relief have for several years taken a place in the exhibitions of the Royal Academy. Terra cottas form an important branch of the manufacture carried on at Lambeth. The distinguished place held by these products of the potter's art is in the main due to the Doulton ware, and their most characteristic quality is their colour. Nevertheless, that which forms their strength, threatens also to constitute their weakness. The defects of the Doulton ware result simply from the tendency to overdo the ornamentation and colouring; that is, they arise from an absence of repose. All these objects, however, are marvellous examples of artistic skill; but as works of art those are the most admirable which are least marvellous or surprising.

Porcelain-painting has for a number of years past acquired in England the character of a fashionable amusement, and many ladies devote their leisure to it. It cannot yet be affirmed that the efforts of the *dilettanti* in porcelain-painting have produced many works of great artistic value, a fact which is probably attributable to the general ignorance of the fundamental principles of art prevailing amongst the ladies taking up this amusement. But where, as has been increasingly the case of late, this branch of art has been taken up by genuine students of art, the results have often been excellent, and articles have been produced which have been extensively purchased and have contributed to that improvement in porcelain-painting which is everywhere making itself felt.

The artistic products of the needle in England have likewise undergone a similar improvement. There is a special school for this branch at South Kensington, where the work of the ladies there engaged is constantly exhibited. Many of these samples will compare advantageously with the best of the older class of articles. In some cases the strict limits of art have been transgressed, but such instances are rare. The achievements of the special school for needlework show best upon screens and curtains, but it is beyond the field of an exhibition that they celebrate their greatest triumphs. This triumph arises from the fact that they have completely extirpated that barbaric kind of wool-working which was formerly the pride of English women. To the influence of this Institute we must attribute both an improvement in the material and in the colours employed in artistic embroidery. We also owe to it the preparation of copies of extraordinary design.

Another branch of ladies' work which has of late begun to be cultivated in England is the Gobelins painting. At first it aimed at copying the Gobelins work with the brush. But to copy at second hand the pictures after which the original Gobelins were executed appears a very unfavourable course of procedure. However, it has already been abandoned, and in place of copying the worked tapestry a sort of durable painting on rough fabrics for curtains, &c., has been substituted. Whether this young branch of art has a future before it, it is impossible as yet to predict. Such, then, are some of the fields in which art has in England made astonishing progress in recent years.

Building in Leyton and Leytonstone.—About three months ago we had occasion to complain of the bad building in this district. We are now informed that a great change has occurred, owing to the action taken by the Local Board and their surveyor. The Model By-laws of the Local Government Board, we are told by those who know, are being strictly carried out. All private connexions to sewers are now made by the Board's contractor, under efficient inspection. Certificates are granted on completion, and the building materials, with few exceptions, are of good quality.

FORTIFIED CHURCHES ON THE NORTHUMBRIAN BORDER.

ALONG the Northumbrian border, at intervals of a few miles' distance from each other, are several ancient churches that possess strong, stalwart stone towers, evidently intended for defence in Mediæval warfare, or as places of refuge for the inhabitants of the districts in which they are situated when alarmed by enemies. They are not always of the same date as the rest of the structures of which they form part; for, in some cases, they have been added after the rest of the fabrics have been in use for two or three centuries. Nor are they lofty, like landmarks; but low, square, sturdy, and inscrutable. There are also a few instances in which churches have been fortified in a similar manner in Cumberland, facing the same borderland, notably at Great Salkeld, Dearham, Newton Arlosh, and Burgh-by-Sands. The abbey church at Holme Cultram, also, in a plea for its maintenance in old times, was alleged to be the only place of defence for the inhabitants against the marauding Scots. The examples in Northumberland are more numerous.

One of the most interesting examples of a Northumbrian church thus constituted, "half-house of God, half-castle 'gainst the Scot," is at Ancroft. This village is about midway between "Norham's castled steep" and Holy Island. In the old days, when there was a monastery on Holy Island, Ancroft was one of the five chapelries on the mainland that belonged to that establishment, and which were served by priests appointed and paid by the priors. The little church has the same characteristics, in miniature, that the remains of the famed monastic buildings on the island still possess, including the low semicircular arches to doorways and windows that denote Norman workmanship. The accustomed eye can see it was, at first, a small Norman building consisting of a nave and chancel, lighted by small Norman window-openings, and entered by a small doorway, which still exhibits the low soft curve of the old Norman builders. The masonry consists of rows of small stones as nearly as possible of the same size, which, as time and weather have softened down their edges and left interstices between them, have a beadlike regularity. On the western end of this little ancient edifice Plantagenet masons built a strong tower. They took off as much as was necessary of the roof, and, on the Norman walls, raised two upper stories, firm, square, and compact. The manner of building with small regular stones in even courses had passed away, perhaps because there were then cleverer contrivances for lifting, and better appliances for removing, larger stones from the quarry; and we may see the Edwardian builders used larger stones in a more irregular manner. Here and there, when they found a stone was too small to keep the level of a course, they filled in the space with a smaller one, thus giving two to make up the height of one, in some places; although they preserved a general aspect, as well as certainty, of massive strength. Worn with sea-fret and the storms of five hundred winters, their work still stands intact and upright, though much of the rest of the original building has been taken down and removed to make way for modern enlargements. A Plantagenet tower has also been built on the west end of a Norman church at Ponteland, nearer the Tyne.

There is another warlike Edwardian tower at the west end of Ingram church. This stands in a wild country on a bend of the flat pebble-paved shore of the river Breamish, in the hilly district of the Cheviot range. There are hills in every direction, with their sloping sides strewn with great grey lichen-spotted boulders, and bright with heather and mosses; but between these hills there are valleys that must have afforded every facility for the operations of moss-troopers. The builders of Ingram Church, therefore, bethought themselves of a strong tower. "Go to," they may have said, "we will build us a tower." If there ever was a more ancient building on the site, but little use was made of it, for this fabric is built from beginning to end in the lighter manner that was in vogue after the Norman style was discontinued. Every arch is lofty as well as light; every window is long, narrow, and acutely pointed like a lancet. The chancel arch has the same delicate and venerable beauty, and at the west end rises the evidence of the insecurity of the district at the time of its erection. The plan of this tower is square. It has three stages, whereof the lowermost is lighted only by arrow-slits, the second by small square-headed openings, and the uppermost by double lancets of similar dimensions. It has a double chamfered base, and midway between it and the projecting parapet there is a "set-off," or sloping line of masonry, marking a slight reduction in the size of the topmost stage.

These fine old towers have another comrade at Ilderton. Only two stages of this one are left. The third has been rebuilt, with large window openings and a flimsy embattled parapet. All the rest of the church has been likewise rebuilt in the same poor unsubstantial fashion. But we can see there was originally Norman work in the edifice, for the masons who have rebuilt it have used up rows and rows of the Norman stones they found ready to their hands. They dealt in a very rough-handed way with the Plantagenet tower, as we have seen. Further, they broke an arched doorway through it, which is now the only entrance for the congregation. This tower is but 18 ft. square. In the south-west angle of it there is a winding stair in the thickness of the wall.

The tower of Eglingham Church has about the same dimensions as that at Ilderton, but it has not been so ill-used. It still stands its full height, looking across the wide sweep of country extending from the Cheviots on the one hand to Alnwick on the other, with its masonry intact. It is lighted with double lancets, just as the barbican of Alnwick Castle is lighted, and the only entrance to it is from the interior of the church. The second, or central, stage bears traces of having been used as a chamber. There is a small opening in the east side of it through which the services in the church could be observed, and on the north side is an aumbry or cupboard. The church suffered in the seventeenth century, when a Scottish army, under General Leslie, left it in ruins; but this tower must have looked down upon the war-wasted building comparatively uninjured, and, sentry-like, guarded the site till better times came round, and masons were set to work to repair the dilapidations. Within the last few years a chieftain among the antiquaries of the North has been at the cost of capping it with a high pyramidal roof, and causing careful repairs to be given to it.

Midway among the heathery and mossy moors that stretch from Alnwick to Rothbury, and close to Edlingham Castle, stands Edlingham Church. The castle does not date much further back than the Restoration, therefore the inhabitants of this district, remote from towns and help, fortified their church in earlier times. It was a small ancient Saxon edifice, one of the first built in the days of the Saxon Evangelists. A sombre tower was added to the west end of it in Plantagenet days, with no external entrance, and no windows below the height of a man. There were plenty of stones at hand on the surrounding moors; they only required fashioning. We may note the long quoins made to suit them. We may note, too, that the doorway, which opens from the interior of the nave, is furnished with receptacles for a strong bar on the outer side, as though persons had sometimes been prisoned in this tower.

Every Northumbrian church-tower is not of this military character, it must be observed. Some have great doorways into them, easily forced; some are capped with spires; and the lovely lantern of St. Nicholas, Newcastle, is an architectural feature with which most people are familiar. There is a very fine tower, for instance, at the west end of St. Michael's Church, Alnwick; but it has not the warder-like features of those just described. It has not been built for defence, for it has grand bold step-buttresses at each angle, from its base to its parapet, whereby a nimble man may easily climb to the top of its three stages; and wide traceried window-openings of the same ornamental fifteenth-century workmanship as the rest of its masonry. At the east end of the same church, however, there is a peculiar turret that has evidently served some purpose in Border warfare. It is on the south-east angle of the chancel. It has a winding stair in it, and an embattled parapet, and gives access to the roof, upon which are traces of a small chamber. Here may have been lodged a sentinel, or guard, when extra danger called for extra vigilance. The turret may have held a beacon-light, or it may have protected the guard whilst displaying signals and taking observations. Below the embattled parapet is a moulded stringcourse, and below this again, here and

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there, are tiny slits to give light to the stone stair within. Now only used as a means of access to the leads upon the roofs, it stands basking in the sunshine of its southern aspect, acquiring with each summer's sun a deeper richness to the tints of its amber masonry.

One of these old Border church-towers has been nearly lost by fire within memory. The conflagration in question occurred in the Church of St. Peter, at Long Houghton, and was so considerable as to involve rebuilding the uppermost stage of the tower. It was then observed that the walls of it are 4 ft. thick, and 23 ft. long by a width of 22 ft. Its stalwart, sturdy comrades are not always quite so large. There is something more about Long Houghton tower worthy of note. It stands on the site of an old Saxon tower, and has the original Saxon tower arch incorporated in it. We can gather from the evidence of the stones that the church built by the first Saxon teachers consisted of chancel, nave, and tower. After standing 300, or, perhaps, 400 years, it was rebuilt all but the chancel arch (which must have been considered sound enough to be retained), and the arch and piers of the tower, which were also deemed sufficiently strong to serve as the beginning of a fortress that Scottish raids and moss-trooping customs rendered necessary for the safety of the surrounding population.

There is another of these towers, sea-bleached and wind-worn, at Newbiggen, yet with its fine strength apparent in every line of its honest masonry. The great sea comes almost up to the churchyard sward on which it stands, lazily lapping the sands, or raging and beating upon them, ever changing, but the gloomy grey tower, unscathed, unmarred, stands, an unvarying testimony to the needs of the troubled days of old. It is now surmounted by a spire.

A grand grave tower, with corbelled-out parapet, still stands at the west end of the Church of St. Mary Lesbury. This is very stern and rigid-looking. Lesbury was once the ecclesiastical centre of a large district, for in the twelfth century there were three chapelries attached to it,—Alnwick, Long Houghton, and Alnmonk. As time passed by, changes were effected that made the head-quarters of the Percies, Alnwick, of more consequence than the parent church, and the sufficient safety of the district was secured by the erection of the strong tower in question attached to the church.

There is historical testimony to the fact that Warkworth Church was the scene of a great slaughter when the Danes landed in its neighbourhood, and finding the inhabitants had taken shelter in the little Saxon church, surrounded it, and massacred them every one. About 100 persons are thought to have been slain on this occasion. A century after this outrage, one of these martial towers, 23 ft. square, was built at the west end. In a later century, probably after Warkworth Castle was built, when the tower would not be required to defend the inhabitants any longer, a spire was placed on the top of it, which still ornaments the structure.

There is a fine tower to Bolam Church, still more ancient than those before mentioned. It stands on the ridge of a slope looking over the wide domains of the warriors who held Belsay, Bolam, Meldon, and Mitford in the days of yore. Like the rest, it has three stages, and is only to be entered from the interior of the nave, as it has no external doorway; but it has the additional interest of a great antiquity, for close up to the parapet is a course of herring-bone masonry, marking its Saxon origin. Through the intervening centuries, when Norman masons took down the rest of the Saxon building, and Plantagenet masons afterwards took down nearly all the work they substituted for it, and wind and weather so wrought with this newer work, with its elegant detached columns and dog-tooth ornament, that it became old and grey and worn in its turn, this tower has held its own. The lowermost window openings have been tampered with and enlarged, but the uppermost stage still preserves in their integrity the Saxon openings, with the massy recessed baluster that divides each into two lights. Whittingham Church, in a neighbouring vale, still preserves the two lowermost stages of a fine Saxon tower. At Long Houghton there was probably a tower similar to these, but, as indicated, the Norman masons did not spare it, but took all of it down except the tower-arch. It is possible, too, there was a Saxon tower at Ingram, and that the arch still stands in the present Edwardian structure. Woodhorn Church, also, has preserved a Saxon tower arch. The Saxon towers appear to have been about 12 ft. square, and those of the Plantagenet period about 20 ft., more or less.

We learn, therefore, that on the Northumbrian border, in Saxon and in Plantagenet days, the parish church was not only the scene of the baptism, marriage, and burial service of the parishioners, and the centre to which they all gathered for worship on the Sabbath, but the literal stronghold to which they resorted when menaced by their enemies, and in which they placed their wives and children for safety when alarmed by the approach of enemies. After the great catastrophe of the Norman Conquest we may conclude there were fewer apprehensions, for the small Norman churches or chapels in the district have no towers. As time passed by, and the strength of the new strong hand relaxed, aggressions grew. The Scots became rivals, and towers were again in request.

Just as every nobleman had his castle, and every gentleman his pele, or tower, in this border country, when Edward was marching his great armies Scotlandwards, many parish priests likewise lived in towers within a stone's-throw or so of their churches. In some parishes there is still a tower to the church, as well as a tower in the vicarage-house, as at Embleton and Ponteland, whilst in others where there is a tower in the "mansion of the vicarage," to use the old phraseology, there is none to the church, as at Elsdon and Shilbotell. In fine, clergy, noble, gentle, and simple, from Plantagenet times down to the days of the Tudors, alike acted upon the impulse of the prophet, "I will stand upon my watch, and set me upon the tower, and will watch to see." We may assume a system of correspondence by signals was maintained from tower to tower, which increased their utility, and reduced the necessity for patrol.

THE INTERNATIONAL SANITARY CONGRESS.

A BRILLIANT assembly gathered in the Aula of the Geneva University to witness the opening of the Sanitary Congress.* The room, small in size, yet with its three galleries capable of holding a great many persons, was admirably adapted to the purpose. The feeblest voice could make itself heard. Every sanitary reformer is not of necessity gifted with powerful lungs.

Dr. Lombard, of Geneva, occupied the chair, and enthusiastic applause broke forth when Dr. Pasteur took a seat by his side. The speeches of welcome were, of course, pronounced by the Swiss local authorities, the first to speak being the Councillor-General, M. Schenck. He remarked that Switzerland was the country of all countries for international congresses, especially if their motives were calculated to be of general benefit to humanity. The preference which Geneva enjoyed was due not merely to her geographical situation, but to the ready sympathy of her population, and the ardent champions any good cause would find amid the Swiss people. It was to Geneva that the honour of the International Treaty for the succour of the wounded in war belonged; and at Geneva a great war had been prevented by the arbitration with respect to the Alabama claims. Switzerland having much to learn was particularly eager to welcome the Sanitary Congress. Her death-rate was not 17, but rather 25 per 1,000, and, therefore, the country was eager to accept good advice.

The delegate of the Council of State of Geneva, M. Hiridier, urged that hygiene would tend to do away with war, as the Red Cross Convention had already mitigated many of its horrors. Its strength rested on the spread of education, and Jean Jacques Rousseau, a citizen of Geneva, had been one of the foremost promoters of the cause of education. In ancient Greece, Rome, and Egypt hygiene held a high position. The ignorance of the Middle Ages alone caused its tenets to be neglected, and Europe was punished by appalling outbreaks of the plague.

M. Le Cointe, of the Geneva Municipal Council, insisted that the Town Corporation would be the first to benefit by the good advice of the congress, and invited a frank exposition of all local defects. The Swiss were a proud people, but they wanted light everywhere, and on everything, knowing that progress was always possible.

* See p. 349, *ante*.

Dr. H. C. Lombard, as president of the Committee of Organisation for the Congress, in offering his welcome, remarked that the members, though they could not expect a royal reception, might count on a cordial greeting. He then described the improvements already realised at Geneva. It was not the present generation but their ancestors, who were to blame for the narrow streets. Formerly the one large street used to be crowded with the stalls of a permanent market. Now this had been swept away, and rachitism was no longer constantly visible amid the population. To an American, named Church, they were indebted for the introduction of the first steamer on the lake, and when navigation became popular they were obliged to improve the unsightly water-side. The unwholesome sewers emptying from nondescript hovels into the lake were now removed, and beautiful embankments constructed in their stead. Afterwards, and as a more important improvement, came the destruction of the city walls, which hid air and light from the town. The handsome building where the congress was now united stood on the site of the ancient city moat. The population was not half so crowded, and there were large gardens both inside and outside the town. Geneva was built on an amphitheatre freely swept by the prevailing winds, notably the cold north wind. This might tend to increase inflammatory systems, but it carried away the germs of disease, and to this cold wind was attributed the cessation of the great cholera epidemic. The water drunk in the town was also remarkably pure,—one of the purest water-supplies of Europe, according to Professor Tyndall. The workmen of Geneva eat abundantly of meat, soup, and vegetables, and this contributes greatly to maintain the health of the population. Further, the visitors will have seen that the schools are built like palaces,—palaces not for the dwelling of kings, but for the education of the youths who are to become the sovereign people. Yet, if much has been done, still more remains to be accomplished.

The Secretary-General, Dr. P. L. Dunand, then read his report, from which it appeared that the Governments of France, Italy, Spain, Roumania, Hungary, Holland, Servia, Sweden, Mexico, Portugal, Prussia, Bulgaria, Canada, Switzerland, and Belgium had sent special delegates. Further delegates were sent by the municipalities of Rheims, Bucharest, Geneva, Paris, Lausanne, Neuchâtel, Rath, Seville, Lisbon, Nancy, Turin, and many other towns. A number of societies and academies from all these towns and countries had also sent official delegates.

Dr. Pacchiotti, Senator, president of the Turin University, and of the Third International Congress of Hygiene, which was held two years ago at Turin, then delivered a most eloquent speech, proposing that Dr. Lombard should be president of the present congress. We wish we had space to reproduce the poetic charms of this discourse. It was the most telling speech of the inaugural sitting, but an abbreviation would not do justice to this passionate exordium. Switzerland was the holiday land of all Europe. Here overworked and broken constitutions came to seek health, recreation, and happiness. It was the land of those who loved, and of those who had loved too well. Both gained strength in the contemplation of its beauties, and became wiser and happier. While war was raging in Egypt, and all Europe was arming, the Swiss were discussing hygiene. They were a truly happy people, and if Europe could follow their example it would become a vast Switzerland.

This allusion to Victor Hugo's dream of the United States of Europe was greeted with enthusiastic applause.

After some formal business, the first sitting of the congress was closed, and the members went home to prepare for the official reception held the same evening at the theatre by the town authorities.

The Trades Union Congress will be opened on the 18th of this month at Manchester. The principal business brought before it will most likely have reference to the amendment of the Employers' Liability Act. On this subject the trade unions and the miners' organisations of the country may be said to have fairly made up their minds. A Bill to carry out their wishes was, it will be remembered, introduced at the beginning of this year by Mr. Burt.

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FROM GERMANY.

New Astronomical Observatory at Bamberg.—Dr. Carl Remeis, of Bamberg (Bavaria), lately bequeathed to his native city a sum of 20,000*l.* for the erection and maintenance of an observatory. The amount devoted to the erection of the structure will be 9,000*l.* A sum of 7,500*l.* will be invested to form an endowment fund for the payment of the astronomer who will be appointed to the observatory, and of the other officials, as well as for keeping it in repair. The remainder of the amount will be devoted to the purchase of instruments. The testator has, however, left the observatory a number of instruments as well as the money referred to.

The Munich Electrical Exhibition.—Following in the track of France and England (whose displays at Paris and Sydenham opened a new era in the development of electrical science), Germany has been preparing at Munich an exhibition of a similar character, the opening of which has been fixed for September 16th. In addition to numerous examples illustrative of the progress of electricity in various branches of technical research, its practical application to public and private uses will be shown upon a scale of importance commensurate with the position this branch of the subject now occupies in domestic and industrial economy. Amongst the features of the exhibition are the following:—

1. Free lectures by eminent men of science.
2. A free library, containing technical works as well as periodical scientific literature.
3. A well-arranged catalogue and a guide to the exhibition written in a popular style.
4. *Viva voce* explanations of the objects exhibited by a number of young scientific men, who will take it in turn to attend at the building, and will give the visitors all needed explanations.

The exhibition will be open until October 16th, according to the arrangements made in the first instance. Doubtless the object of limiting the time has been the probable difficulty of attracting many visitors from a distance at a late period of the autumn.

New Bridges at Berlin.—The Berlin Municipal loan of 1878 placed at the disposal of the authorities a sum of 4,000,000 marks (200,000*l.*) for the building of new bridges of a solid character, and designed to accommodate the present increased traffic. The works already executed and still in progress represent an expenditure of nearly 300,000*l.* To meet the deficiency and to provide for further works of the same kind, a second loan of 200,000*l.* is being raised. Should the deepening of the bed of the Spree take place (according to the present intention of the Prussian Government), the bridges still to be built can be on a level with the thoroughfares adjoining, or at a slightly higher level, without the navigation of the river being impeded. This would allow of the estimated cost of the new bridges still proposed (varying from 23,000*l.* to 45,000*l.* each) being materially reduced, the approaches having hitherto formed an important proportion of the total cost in each case.

Pavements in Berlin.—The Berlin police authorities, in their decennial report, speak unfavourably of asphalte pavement as compared with good granite pavement, so far as the safety of traffic is concerned. In addition to the numerous cases of horses falling, it is remarked that it is difficult to stop or turn horses quickly on the asphalte. Wood pavement is also found inferior to granite in this respect. It is stated that even on the worst stone pavement, fewer horses fall than on wood or asphalte. These assertions are based on actual observations.

The Berlin Hygienic Exhibition.—The active co-operation of the German Government in the exhibition is considered in well-informed circles as being rendered certain by the fact that the director of the Imperial Sanitary Department has recently joined the committee. The competition for the building of the new structure is confined to six firms. Twenty-two leading firms were invited to tender, but sixteen of them declined to do so on account of the multiplicity of their present engagements.

Gothic Architecture in Hungary.—According to a recent treatise from the pen of Abbate Lublich (custodian of the Agram Museum), there is in Hungary an older monument of Gothic architecture than any existing in Germany. The instance to which he refers is that of the church at Topuzsko (or Toplica), the ruins of which point to its having been designed in a pure Gothic style. The date assigned to it is about 1205, and the site would seem, by records still in existence, to have been granted by King Andrew II. to the Cistercian order, some members of which had come from the French Abbey of Clairvaux towards the close of the twelfth century, and settled in Hungary. The clergy were in those days their own architects in many cases, and the fact of the Gothic style having been adopted in this instance, goes to prove (according to the arguments adduced) that France was the home of Gothic architecture at an earlier date than Germany.

AN OCTOGENARIAN ENGINEER.

THE *Army and Navy Journal* of New York, of the 19th of August last, contains a reference to the fact that in that month the venerable Nestor of the profession of civil engineers, Captain John Ericsson, K.V., entered on the eightieth year of his age. We claim, on behalf of the civil and mechanical engineers of England, an interest in the health, wealth, and fame of Captain Ericsson. It is only due to one of those minor events,—accidents, as we ignorantly call them,—on which the turning point of human life so often depends, that we have not had to congratulate the father of the ironclad on keeping his eightieth birthday in London, or in Manchester. On the Liverpool competition in 1828 there is no doubt that Ericsson's engine, the "Novelty," was the best on the ground as regarded design. It was not of such stout and sturdy workmanship as the "Rocket" of Stephenson, and, breaking down more than once, the prize was adjudged to the latter. But no one who stood, on that memorable day, beside Ericsson on the foot-plate of the "Novelty," and saw the change that came over the face of Mr. Stephenson as the competing locomotive shot by his own on a parallel pair of rails, would ever forget it. As it was, Stephenson knew how to hold the lead that he had worthily acquired as a workman, rather than as an inventor, and Ericsson, thus failing to become the first man in the profession here, went a few years after to America,—without prejudice to his being regarded by those who knew him as the first engineer in the world. Now that age has put its silver crown upon him he is that, and without a second.

The *Army and Navy Journal* refers with appropriate respect to the labours of Captain Ericsson during the last two years. These comprise (1), the reconstruction of his original caloric engine (which was completed about 1834), and its application to pumping. The success that has attended this reconstruction is attested by the sale of upwards of a thousand of the engines by the Delamater Works within the last two years. Second, we place a high-speed steam engine for electric machinery, with a single steam cylinder of 5 in. diameter, and 3 in. stroke, making twenty-one revolutions per second, under steam of 55 lb. pressure on the valve; the Prony friction brake shows that a 12-horse-power is obtained. Thirdly, a solar pumping engine applies, by a method long since perfected by Ericsson, the rays of the sun to heat atmospheric air, and thus replaces such contrivances as the old windmills of the fens by a costless and mighty, if somewhat variable source of power. The fourth invention is the application of hydraulic training gear for changing the direction of the torpedo boat, the *Destroyer*, as to which we reserve any further remark. And the last is one which, although called forth only for the service of this last of the ocean children of the inventor of the *Monitor*, is capable of very wide application in war no less than in peace. It is the application of a reflector to the wooden backing of the *Destroyer*. By means of this, the helmsman and commanding officer, while standing on a grating placed so low in the vessel that their heads are 2 ft. below the top of the armour plates, are able to see both sea and sky forward of the vessel, and thus to approach the enemy while protected from his guns.

When we consider how small an elevation gives a commanding view over the flat level country, especially when the air is dry and clear, we cannot but think that a very small balloon, by no means adequate to carry an aëronaut, might be fitted with reflectors, and so managed by silken cords as to give to our look-out in Egypt very precious information as to what is going on behind the sand rampart of the enemy.

SELF-SUPPORTING RESEARCH.

HOWEVER successfully the scientific men may be able to combine, as they certainly seem to do in the present day, their well-directed studies with the principles of lucrative commerce, it can scarcely be said that the archæologist has as yet turned his delightful pursuit to any pecuniary profit. Happy student! like Agassiz the naturalist, he has no time to make money. It is alone his dependence on those sinews to carry on his war with the action of time, which are so requisite in every struggle that ever leads him to disturb a public who unfortunately he only too often finds indifferent to his appeals. His demands are never exorbitant. Of the millions ungrudgingly voted to be squandered on costly and not unfrequently useless experiments he would shrink from demanding even a tithe for his use. A few hundreds he finds the utmost difficulty in raising in a country where private fortunes are enormous. We are afraid the chief interest he finds awakened by his appeals in favour of his pursuit is,—as we remember to have heard the American sculptor, Horatio Greenough, say of his artistic appeals to the Senate of his country,—chiefly an antagonistic one. Subscription slowly supplies the sums requisite. It is sad to think how many are the directions in which the researches of the archæologist might be pursued were it not for the monetary difficulties that invariably hinder all consecutive study.

The plan of making antiquarian excavations self-supporting is admirable, and has been wisely adopted by the Italian Government. For some years past the system has been found to work well. It is true that in Italy there exists, as in France, a commission that watches over the historic monuments of the country. In spite of the efforts made in this direction, we seem almost as far off as ever from this consummation in our country.

The Italian Government derives a very considerable income from the admission of visitors to the national historic monuments, among which are numbered the museums. The traveller now is admitted through a turnstile, on the payment of a franc, to the Uffizi Gallery at Florence, the Brera at Milan, the Museo Borbonico at Naples, the Vatican at Rome, the local museums, such as those at Siena, and elsewhere; in fact, all the art galleries of the principal cities; and, greatest surprise of all (to those who remember Italy in the past), one enters Pompeii as one would the Crystal Palace or the South Kensington Museum.

By means of the funds thus collected, the Italian Government is able yearly to devote a handsome sum to the purchase, the restoration, the protection, and maintenance of existing historic monuments, and to continue its archæological researches, foremost among which come, of course, those in the buried cities at the foot of Vesuvius. All the old system of uncertain fees to *custodi* is abolished, and an agreeable branch of the Government administration has been organised throughout the country.

We have been reminded of this skilful settlement by the Italians of the monetary difficulties that so constantly beset archæological research, by the adoption of the system of self-support in the interesting Roman villa discovered now two years since at Brading, in the Isle of Wight. As we announced in these pages not long since, the ground on which (or, perhaps, rather, under which) the villa lies, has now, after having belonged to two separate owners, become the sole property of Lady Oglander. The tiresome difficulties which for some time had hindered any further research, having been now arranged, a turnstile has been set up, and the funds having accumulated,—thanks, also, to the aid of some generous subscribers,—work has just been resumed on the eastern side of the villa. Whether, however, the present proprietors are justified or not in their belief that still greater treasures are likely to be unearthed, we ourselves have some doubt, but that they are certain to discover other portions of buildings there can be no question whatever, numerous Roman remains having, it would appear, been found in the neighbourhood.

The discoveries so far made have been of such importance and exceptional beauty that it is alone the most sanguine who could hope to find any further work of equal merit to that already laid bare. What is at present placed before the public is of sufficient interest to hold out to the proprietors ample promise of a positively remunerative return for their efforts,

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We foresee the villa near Brading becoming in time as much frequented as Pompeii. Not only the antiquaries, but the excursionists from the remotest parts, are paying Brading and its Roman villa a visit, and well may they do so, for, although the British Museum is filled with treasures of the greatest periods of antique art, there is no spot within four hours of London where may be seen, as they have been reposing now for hard on 2,000 years, such specimens of the art of antiquity as are to be seen in the Brading mosaics. It is not until the traveller should reach Pompeii that he would be able to see, apart from the interest attached to the residence of a refined Roman, a piece of mosaic work so grandly conceived and composed as that which covers the floor of the largest chamber in the villa.

Roman villas are no rarities, but villas containing works of art such as the pavements of the Brading villa are indeed rare. Those who in their visit to the Isle of Wight have the opportunity of comparing with this treasure the villa which has long been one of the attractions of Carisbrooke, where the few interesting remains of the home of a former Roman resident nestle under the walls of the famous old castle, can see at a glance, without requiring the erudition of the antiquary, the value, artistic and archæological, of the villa discovered at Brading.

IMPORTED IRON.

ALMOST unnoticed, a startling change has during the last few years, taken place in the metallurgical world. The iron manufacturers of Great Britain have come to depend in very great degree upon foreign nations for a large part of their raw materials. If we look back twenty years we shall find that the iron that was made in Great Britain was made almost exclusively of that smelted from our own ores; but this is far from being the case now. A few figures will show how great has been the growth of the demand for iron ore from other parts. In 1861 we imported 23,408 tons of iron ore, all, except a few hundred tons, being brought from Spain. Taking the importations in the total for periods of five years from that date, we find that by the year 1866 the importation had risen to 49,360 tons, and by the year 1871 to 335,033 tons. Again, in 1876 it was 673,235 tons, and in 1881 it was 2,450,696 tons; so that, roughly speaking, it doubled itself in every year named, except that in the last of the periods there was an increase much more than threefold. And it is worthy of note that Spain still supplies the great bulk of the ore thus brought in, for last year 2,227,486 tons were imported from that country, Italy and Algiers sending in the bulk of the remainder. Sweden used to send us large quantities of iron ore, but for the last seven or eight years it has sent us none; and Norway, once a large source of supply, sent us only 118 tons last year; so that it is from the countries of Southern Europe and Spain that our supplies are drawn.

This growth of the use of imported ores is due to one cause,—the increase of steel-production. Until the basic process was commenced it was tolerably clear that the great bulk of the iron ores of Britain were not suitable for use in the steel manufacture; and thus as the use of steel grew, there was an inevitable use of ores that were so fit. The rich districts of Furness and that of West Cumberland had ores that were so usable, and there was a continuous growth of the production of these; but there was a call beyond that that they could supply. And, moreover, many of the works that were on the coast could bring ores from Spain by sea cheaper than they could bring those by land, so that there arose the vast demand for ore that has caused the swelling of the imports shown in the figures above given, and that seems likely to continue, though probably not with such rapidity. There is now a systematic attempt to utilise our own ores by the basic process, and this will allow a portion of the steel that we use to be smelted from our own iron, and thus will at least lessen the rapidity of the growth of the imports of iron. But the fact that we use about 2,500,000 tons of ore from other nations, and that they cost with the carriage probably 1,500,000*l.*, is one that should be a very great inducement towards the further development of any and every system that will allow of the increasing use of our own resources, and that would retain a very large amount of money in this country. It is not to be expected that any such change will be very rapid. The imported ore and its product has made itself well known; that made by the basic process from our own ores has yet to win its way in many quarters. But whilst there has been only one large extension, that of Eston, where the process has been in use, there is now in course of construction one that will be equally large, and that will, in the course of a very few months, materially add to the production, whilst in the Shropshire and Staffordshire districts new works are in course of construction or in contemplation, and by these the basic process of steel production will be much extended, and the use of our own ores in the steel manufacture will be extended. It remains to be seen what effect the extension will have on the importation of ores; in the past that importation has been affected by political events in Spain, and that cause alone should induce as much as possible the substitution of our own ores for those the continuance of the supply of which has been broken at times.

COURTS AND COURTS: A REVERIE.

THE Long Vacation is drawing to a close, and we fall a-thinking in this wise:—The probabilities of a visit to London by Macaulay's New Zealander are yearly growing less; but, if in A.D. 2060* a single aboriginal should be left between Cape Maria Van Diemen and Port Pegasus, and, prompted by curiosity, he should take a trip to the Thames and wander along the Strand, his attention will doubtless be arrested by the Courts of Justice, and he may criticise the design as sharply as has already been done, and may continue to be done even to the time of his arrival.

How few of the million passers-by,—home-born or strangers,—as they look up to arch and spire, will, or can, picture to themselves the thirty-three streets, lanes, courts, and alleys that formerly covered the seven-and-a-half acre site of the new building. In a short time the Majesty of Justice will occupy her new palace, and law reign over the spot where but lately lawlessness was rampant. Never were courts and alleys inhabited by a motlier set. At the Punch Bowl, in Hemlock-court, the original Jack Ketch refreshed himself after his dreary work at Tyburn, or in the Strand, or wherever duty might call him. At the Bear and Harrow tavern, which stood close to the Strand entrance to Clement's Inn, died Nathaniel Lee,—"Mad Nat," the dramatist. The Assembly Rooms were in Star-court, and thither, two centuries ago, flocked the gay lords and knights and their ladies from Lincoln's Inn-fields, the Strand, and the streets around Clare Market. In Crown-court the Crown Tavern occupied the site of the palace of the Bishop of Bath and Wells; and Gully, who overcame Cribb in a pugilistic encounter for the "Championship," and represented Pontefract in Parliament, was host of the Plough Tavern, in Plough-court. From Boswell House, Boswell-court, in 1589, Gilbert Talbot wrote a letter of London gossip to his father,—Queen Elizabeth's doughty Earl of Shrewsbury. In this same court for a few years abode Lady Raleigh, widow of the famous Sir Walter. Hither also came Sir Richard and Lady Fanshawe. "In his absence," she writes, "I took a house in Boswell-court, near Temple Bar, for two years." In Ship-yard lingered a dreamy memory of Admiral Sir Francis Drake. In 1654 were published the banns of marriage, "in Newgate Market, upon three several market days, between William Faythorne, stationer, and Judith Grant, daughter of Henry Grant, of Michael's, Cornhill." Not long after the wedding the pair moved into Ship-yard.† But of all the vanished network of buildings Shire-lane was the most remarkable. It was so named, says Stow, because it divided the City from the Shire. It was the birthplace of Sir Charles Sedley, who sang to please an audience that did not place purity high among the virtues. Here at the Griffin Sir John Denham, another poet, while a student of Lincoln's Inn, would madden himself with drink and rush into the Strand to annoy and terrify the passengers. On May 1st, 1670, Antony à Wood, antiquary and biographer of famous antiquaries, writes, "Dined with Mr. Ashmole,"—a brother in ancient lore,—"at his house in Sheer-lane, near Temple Bar." Rocque, in his map (1736), names it Sheer-lane. Sometime previously to 1678, Andrew Marvell, in writing of a boaster, said "he sounds another trumpet than that in Sheer-lane." The Trumpet tavern, which stood half-way up the lane from the Strand, had under the first-floor window a small sign-board, on which was depicted a trumpet, and was one of the oldest licensed houses in the metropolis. The "Tatler" frequently "marched down Sheer-lane at the top of which I lodge," to the Trumpet, and from it he dated many of his papers, and it had for its landlord Christopher Katt, in whose parlour Tonson, Steele, Addison, Walpole, and other bright spirits were wont to assemble. But who knows not the story of the Kit Katt Club? Not far from the Trumpet lived Hoole, the translator of Tasso, who had for almost daily visitors Dr. Johnson and Dr. Warton. These are pleasant scenes in the tragi-comedy enacted on this stage of seven and a half acres, but there were others, alas! in which the woman lost to shame, the thief, and the murderer played their parts. In every court and alley there was a larger percentage of poverty and vice than could be found in any similar amount of space in London. Newcastle-court, up to the day of its demolition, was a synonym for all that is blackest in the schedule of crime. Strange anomaly that the Bible public-house in Shire-lane should have been the rendezvous of the unlovely families of the Jack Sheppards and Moll Flagons.

Over this tragi-comedy the curtain has fallen to rise on a new drama, in which the misery and suffering of hope deferred and the law's delay may flit across the scene, but no parts shall be assigned to loathsomeness and horror.

* See *Builder*, vol. xxix., p. 470.
† Ibid., vol. xliii., p. 219.

SURVEYORSHIP ITEMS.

Congleton.—On the 4th inst., a meeting of most of the members of the Congleton Town Council and of the Borough Bench was held in the Council Chamber of that town for the purpose of presenting a silver tea and coffee service to Mr. W. Blackshaw, the Borough Surveyor, on the occasion of his leaving Congleton for Stafford, to which town he has been appointed Borough Surveyor. The presentation was made by the Mayor (Mr. T. G. Sheldon), who, on behalf of the subscribers and the Council, expressed their sense of the value of Mr. Blackshaw's services and their best wishes for the success of his future career.

Darlington.—At a meeting of the Darlington Town Council on the 7th inst., the first business on the agenda was a motion of Mr. Wharton, "That three months' notice be given to Mr. Smith, the Borough Surveyor, and his staff; also to Mr. Armitage, Borough Accountant, and his staff; and that a General Purposes Committee be called by the Mayor within one month to take the question of the salaries into consideration, and to re-arrange the above staffs." The motion found no supporters. Mr. Smith's salary is 350*l.* per annum, and he has three assistants.

BUILDING IN PARIS.

ACCORDING to recent statistics, the number of houses in Paris is 82,352, against 71,873 in 1876. It appears, therefore, that within five years 10,479 new houses have been built. In 1876, the average number of inhabitants per house was 26; it has since risen to 27, a greater increase of the population having taken place than in house accommodation. Over-building does not seem to be in progress in Paris.

The Great Eastern Railway Company's New Quay at Parkeston.—Owing to the enormous increase in their Continental goods traffic, the Great Eastern Railway Company have opened their new quay at Parkeston for the landing and shipment of merchandise somewhat earlier than they contemplated. The quay is so far completed that three berths are available, with a depth of water alongside of from 16 ft. to 27 ft., according to tide. One of the warehouses on the quay is also completed, and part of the station-building. During the past week two extra vessels,—one from Antwerp and one from Rotterdam,—with full cargoes, have been discharged and loaded at Parkeston. The company intend running two extra boats a week from Rotterdam, and extra boats as required from Antwerp during the present pressure of traffic.

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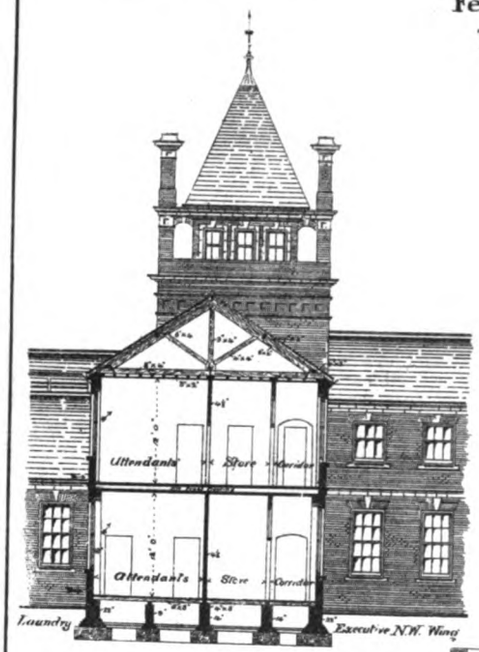
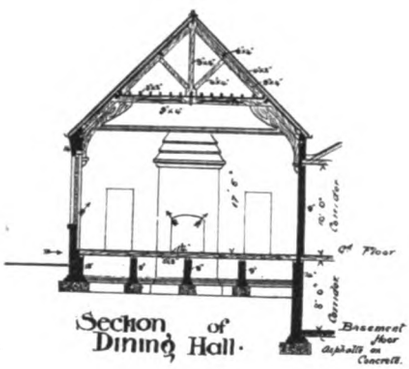
City of
Lunatic

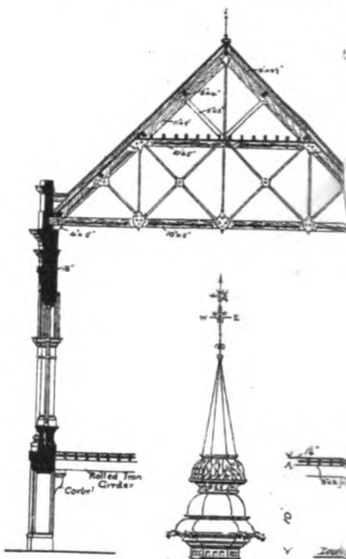
Front Eleva



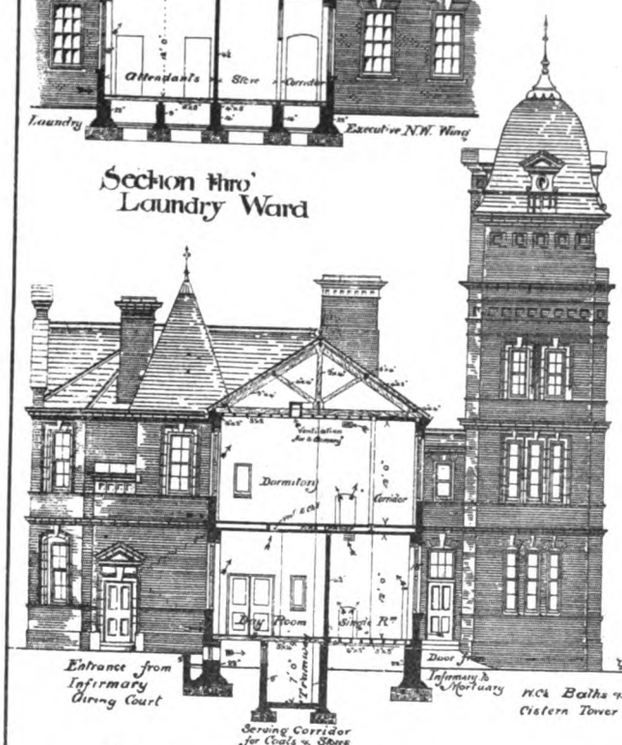
Section thro'
Laundry Ward



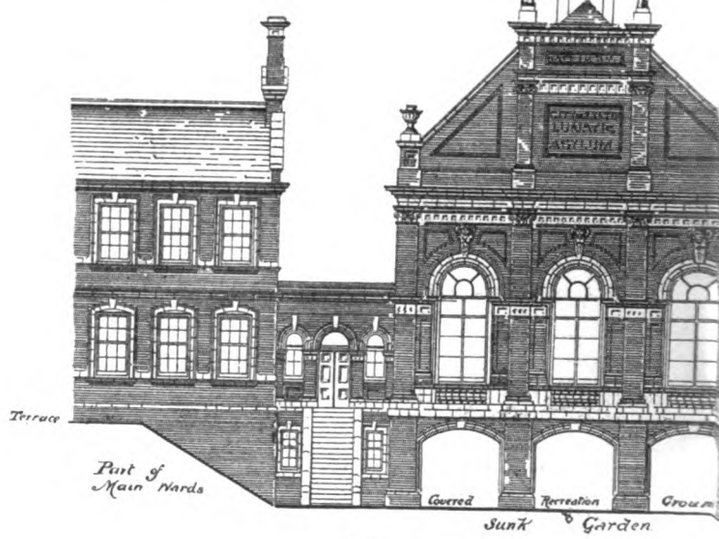
Section of
Dining Hall.



Section thro' Recre



Section & Elevation looking West
thro Main Wards



Elevation of Recreation

Whiteman & Bass, Photo-Litho 236, High Holborn

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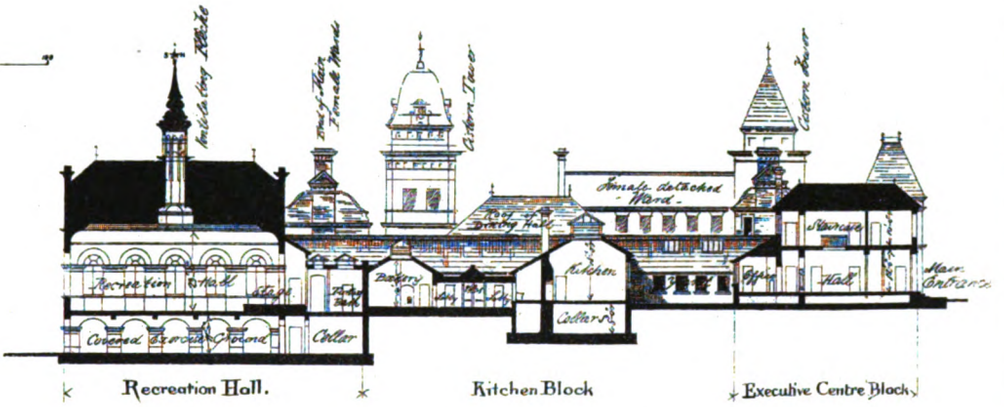
Exeter.
Asylum.

Male Side.

TOTAL 138 PATIENTS.

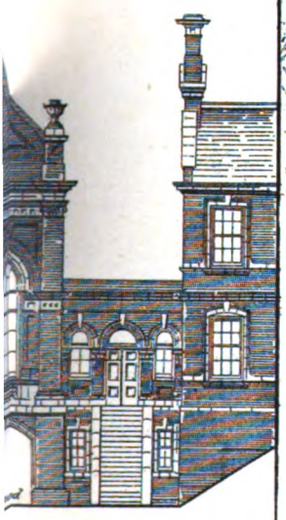
tion *facing S.E.*



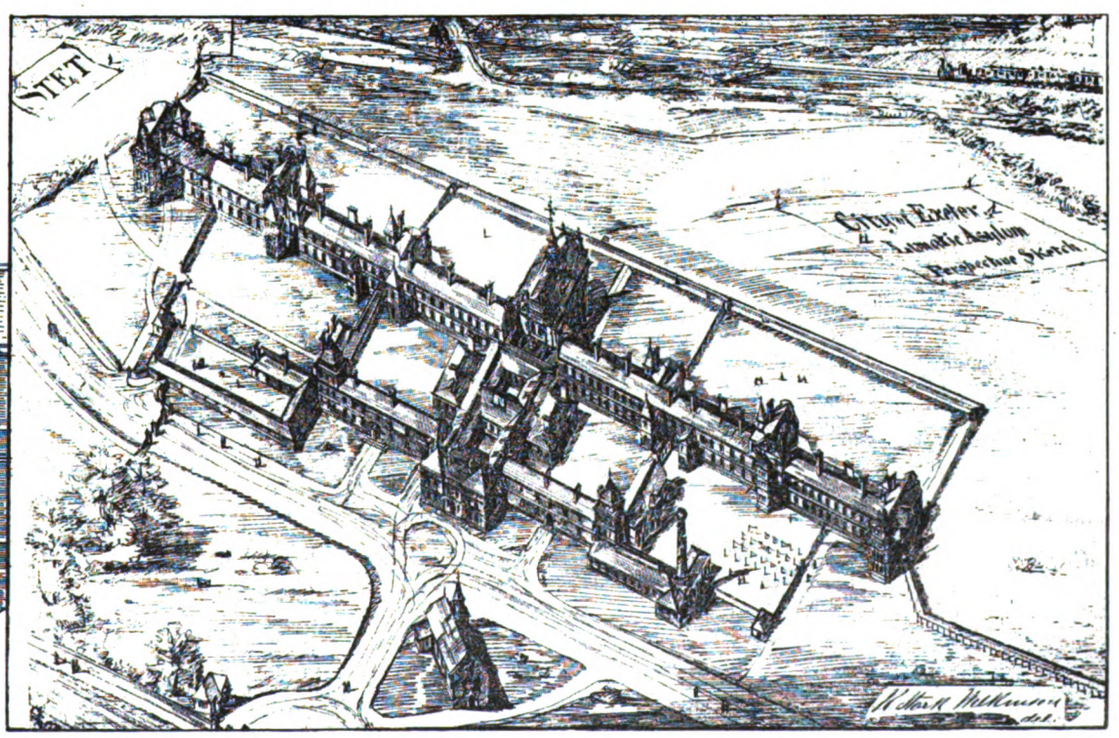
Transverse Section thro' Centre of Buildings
(ON LINE C.D.)

Recreation Ground.

cation Room



Hall:



Wyman & Sons, Printers, 74 Queen St.

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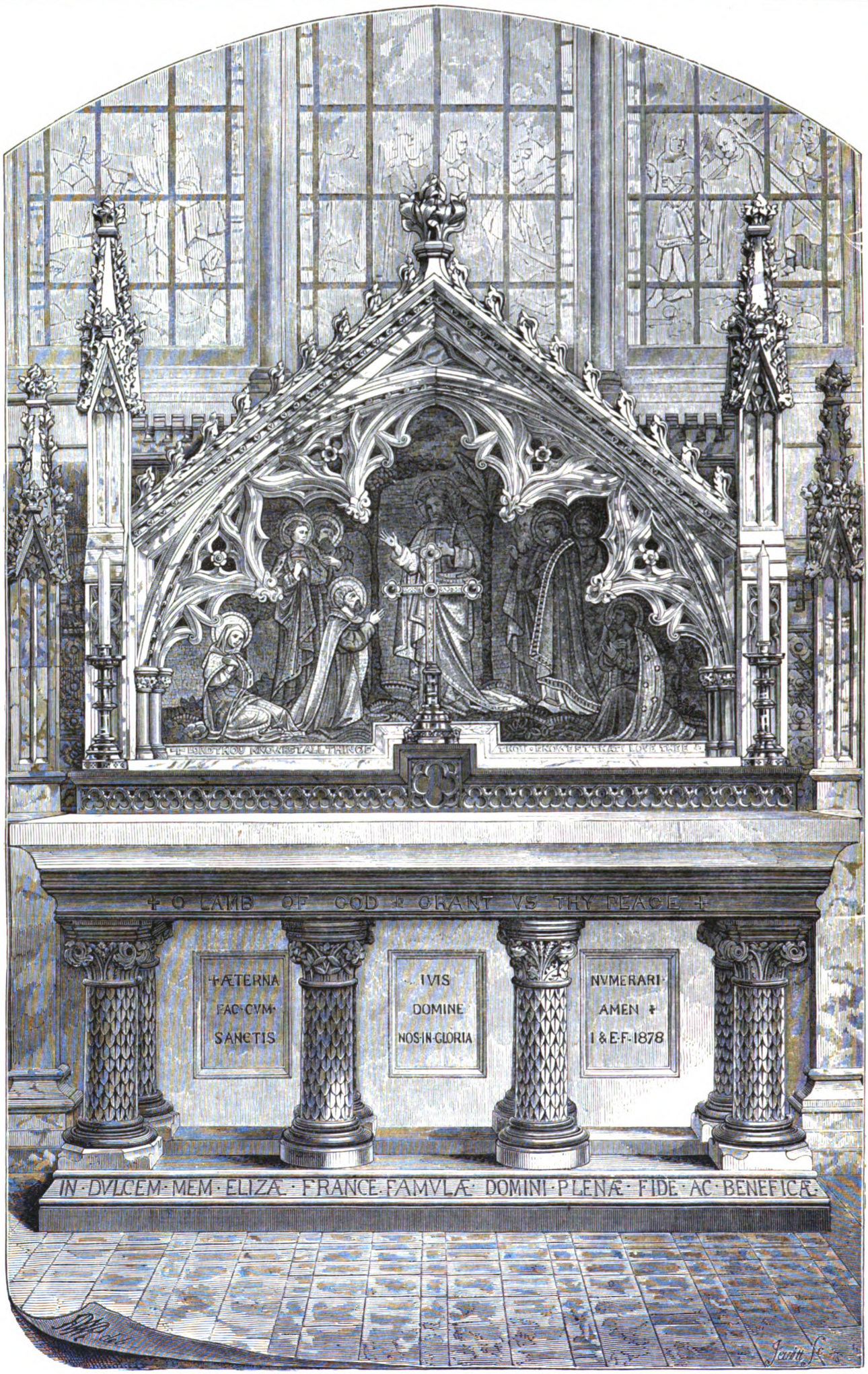

MEMORIAL REREDOS IN LADY CHAPEL, CHICHESTER CATHEDRAL.

MR. CARPENTER AND MR. INGELOW, ARCHITECTS.

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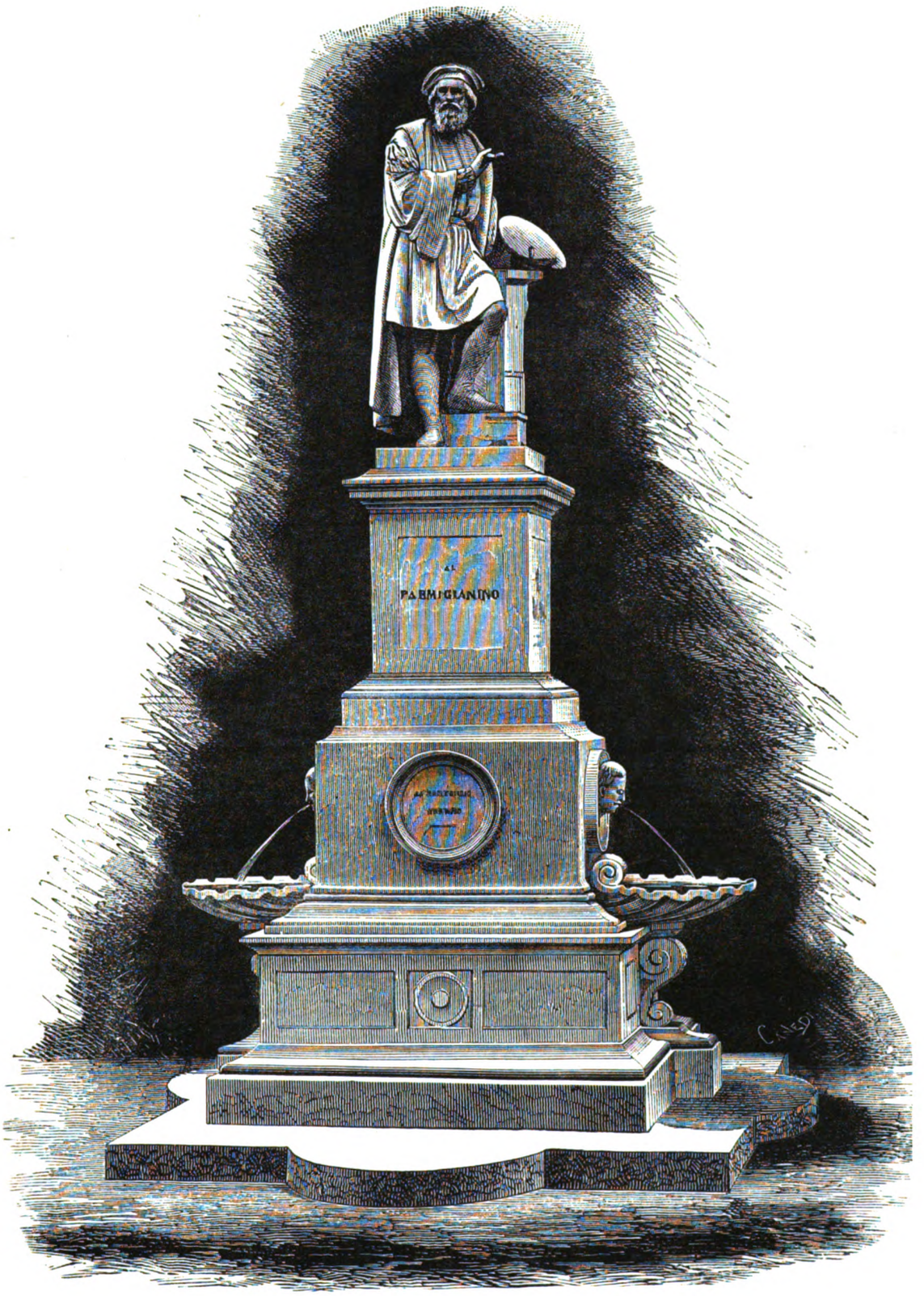

MONUMENT TO PARMIGIANINO, PARMA.—PROFESSOR GIOVANNI CHIERICI, SCULPTOR.

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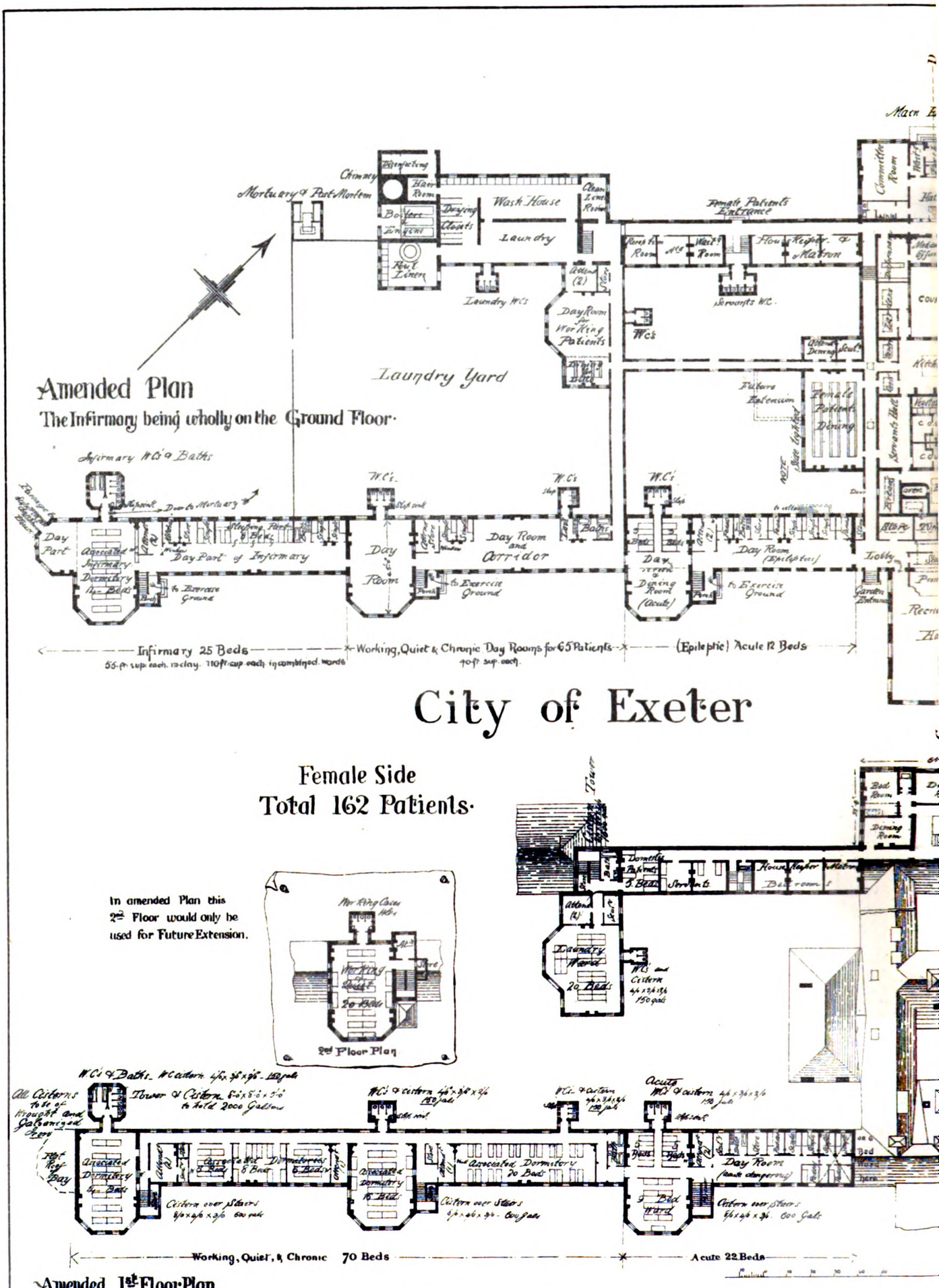

Whiteman & Bass, Photo-Litho 236 High Holborn.

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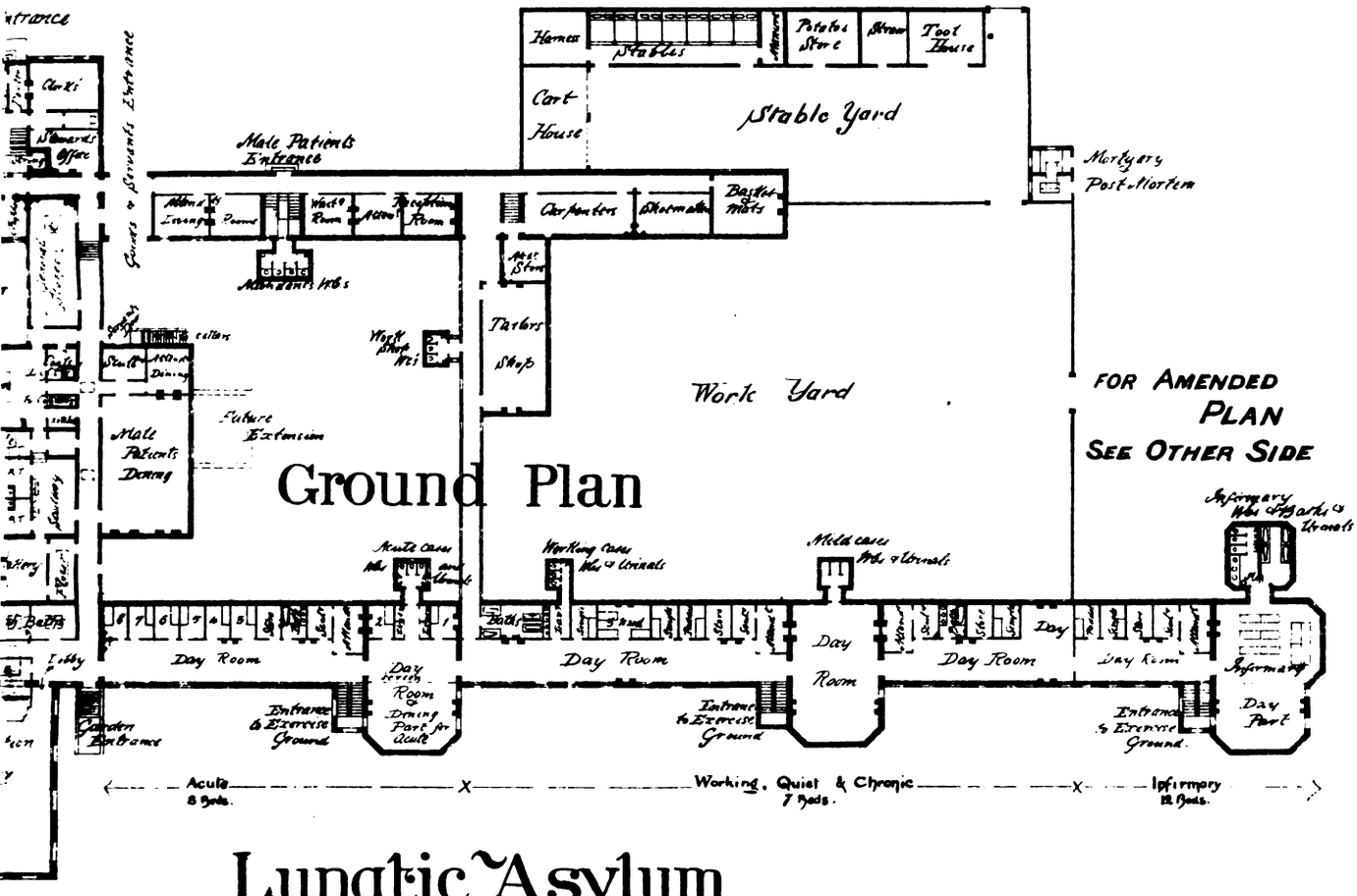
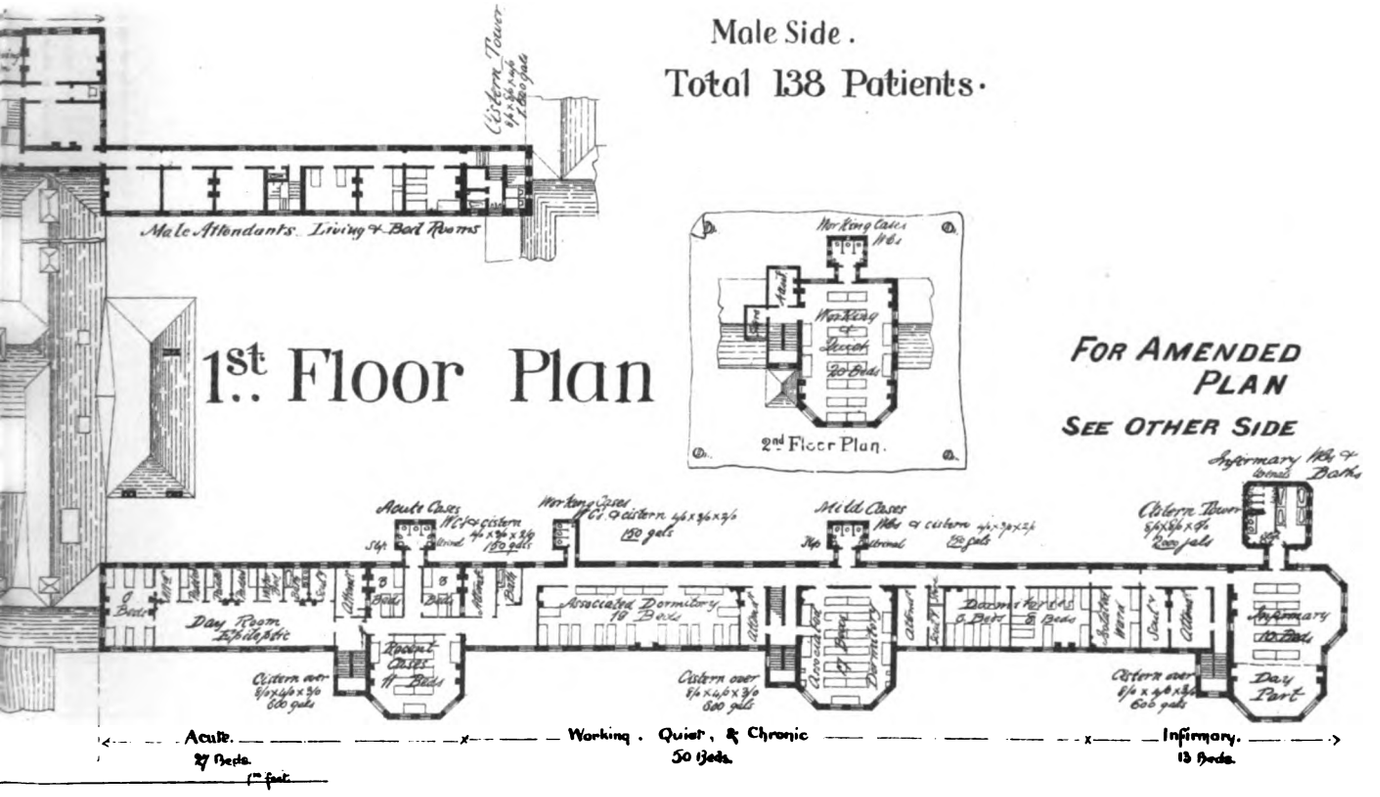


Lunatic Asylum



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NSON, ARCHITECT.

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REREDOS, LADY CHAPEL, CHICHESTER CATHEDRAL.

THE reredos and altar-table we illustrate in our present number were set up in the Lady Chapel of Chichester Cathedral as a memorial of Miss France, Messrs. Carpenter & Ingelow being the architects. The reredos includes some very good carving.

PROPOSED NEW LUNATIC ASYLUM FOR THE CITY OF EXETER.

FOR some years the Corporation of Exeter have had in view the erection of an asylum for pauper patients, to obviate the trouble of sending them to the Fisherton Asylum at Salisbury, and to provide a certain amount of accommodation for the surrounding parishes. At length they secured a fine estate near Heavitree, about two miles and a half from Exeter, overlooking the estuary of the Exe towards Exmouth, which, being approved by Her Majesty's Commissioners of Lunacy, conditions of a competition were issued on the 31st of January, 1881, by the City Corporation, for an asylum for the reception of 300 pauper lunatics, with facilities for enlarging the same at some future time.

The competition was to be divided into two stages, viz., a preliminary one of sketch designs, and a final one with elaborated drawings. In the first one, plans of each floor, an elevation, transverse and longitudinal section, all to a scale of 20 ft. to an inch, were asked for, and a perspective view taken upon a picture-line indicated upon the block plan, in which the building should occupy about 1 ft. in length of a drawing to be 18 in. by 12 in. in pen and ink without colours, but etched or tinted in Indian ink. The geometrical drawings were to be tinted to indicate the various dormitories, day-rooms, infirmaries, kitchen and washing departments, and medical officers' rooms, and premiums of 100*l*., 50*l*., and four of 25*l*. each, were offered. On the 12th of April, thirty-three sets of designs were sent in, and Professor Hayter Lewis (who was retained by the Corporation) adjudicated on the designs, and after having put aside such as were exceptionally extravagant, or more especially worked out in disregard of the Commissioners' instructions, and after carefully weighing the merits and defects of the remainder, he reserved fourteen as being superior to others. Of these he returned eight for the second competition (for which additional instructions were issued), and further detailed drawings and specifications were made and sent in on the 12th of May.

In this final competition the original sketch-plans were allowed to be again submitted, with amendments, if any, made on "flies," and the plans now illustrated were treated in this way. Therefore, the one half differs from the other, the one being the amended plan shown in the final competition, the other being the plan sent in the first competition. Additional elevations and sections were drawn in detail to a scale of 8 ft. to an inch, illustrations of which are shown to a larger scale than the general drawings, and some ½ in. scale sections were also required showing details and the system of ventilation. Professor Hayter Lewis again examined the eight sets finally sent, and reported to the Corporation on the 22nd of June, 1882, that "after carefully reconsidering the prominent features of the several designs, I have no hesitation in recommending the design of 'Stet' for the first premium."

This design, which was prepared by Mr. R. Stark Wilkinson, A.R.I.B.A., of 14, Furnival's-inn, London, who has been appointed to carry out the same by the Corporation of Exeter, we this week illustrate, giving in fac-simile portions of the various sheets of drawings sent in. The general plans, elevation, and section have been treated by the author in the full spirit of the conditions of competition as sketches sufficient to show his intentions to a professional assessor, the larger detailed drawings being more carefully worked out for the second competition.

In his report, the author states that "the designs were prepared so as to fulfil the recommendations of the Commissioners as set forth in their published pamphlets, and with a view to the convenient placing of the executive department, of sufficient size for future accommodation, and to the proper arrangement of day-rooms and dormitories, so as to ensure facility in the overlooking and visiting of the wards by the medical officers with the introduction of as few corridors as possible. The plans, as arranged, give all the day-rooms and dormitories the full advantage of a good south-east aspect, and are capable of extension at the ends in the same line, or by returns.

The day-rooms combine the wide corridors which, at intervals, extend into rooms having through light and ventilation, and attendants' and single rooms as required are arranged at the back of the corridor; while on the first floor, the corridor of access to the dormitories (which are placed out to the front) runs along the back wall over the single rooms. Corridors and staircases are of fireproof construction, as is the whole of the first floor. All w.c.s are entirely isolated from the wards by ventilated lobbies. The recreation-hall is placed centrally, and projecting from the front, divides the male from the female airing-courts, which are all placed in the front of the building on gently sloping ground. A covered recreation-ground is provided under the hall, advantage having been taken of a dip on the site for the formation of the same and of terraces in front of the wings. Seen in perspective, the projection of the hall will obviate the seeming depression in the centre of the principal façade.

The patients enter by separate entrances on either side of the executive block, and are passed from a reception-room into the wards by a corridor, at the end of which is a general bath-room adjoining the wards. The general excess of female over male patients is provided for in a detached building, consisting of day and attendants' rooms and dormitory, water-closet, &c., which adjoins the laundry-yard, and which would accommodate the patients employed in the laundry. A corridor (shown in the amended second plan) connects this with the kitchen departments, and can be used by quiet patients on their way to the dining-room, without passing through the acute ward.

Separate dining-rooms are shown well lighted by side windows, and conveniently placed for serving from the kitchen; but if economy is desired, the recreation-hall can be used as a common dining-room, though the author recommends that it be kept solely for recreation purposes.

Workshops for male patients are provided in the rear of their wing, and adjoining a yard and sheds, which will be planned in connexion with an existing farm and outbuildings now proposed to be incorporated for the use of the asylum.

In the basement a corridor traverses the length of the wards, in which is a small tramway for supplying the wards with coals and stores from the central executive block.

The general stores adjoin the kitchen-block, and close to them is placed the steward's office, and a goods entrance from the roadway. A Turkish bath is arranged next the bakery. The chapel is detached, and is placed near the principal entrance.

The medical superintendent's residence is also detached, and is placed to the west of the building, with a covered corridor of communication. An assistant medical officer has living-rooms on the first floor of the entrance-block.

In the amended plan for the second competition, as shown on the half-plan on the female side, the infirmaries are arranged entirely on the ground-floor, the dormitories having large day-spaces embodied for the use of infirm patients just able to leave their beds for a few hours."

In the original plan, shown on the half-plan on the male side, the infirmaries are arranged on both ground and first floors; the first-floor ward being for those patients entirely unable to go out of their room, and an isolated ward is shown adjoining the infirmary for the reception of cases which might prove contagious, and the author states it is open to discussion whether the original or the amended plan is the better. A detached mortuary for each infirmary is provided at a little distance from them, adjoining the yards.

Water-towers are provided at the ends of the executive block and of the principal wings, of sufficient height to dominate the roofs in case of fire.

The rain-water is collected and stored in underground tanks, and the drainage is kept separate and carried to sewage-irrigation tanks at the lower part of the farm.

The warming of the wards will be chiefly by open fireplaces, protected where necessary with strong wrought-iron projecting cages.

The corridors will have hot-water coils at intervals. Tobin inlet-tubes will be fixed in all rooms. Wards and dormitories and extract-shafts will be arranged from the ceilings and upper parts of walls, carried thence by separate flues into the chimney-shafts. Certain large extract-flues will have gas-rings burning in them.

The water and gas supply will be brought from existing mains to the asylum buildings.

It is proposed to build this asylum of red bricks, with terra-cotta dressings and green slate roofs. The elevations have been kept plain and free from useless detail, and economy of construction has been studied throughout.

The estimated cost of the whole of the buildings is 44,000*l*.; for the asylum buildings proper (as shown on the accompanying engravings), 33,711*l*.

MONUMENT TO PARMIGIANINO.

THIS small but graceful monument, which has been erected to Francesco Mazzola, known by the name of Parmigianino, at Parma, and which we illustrate in our present number, has been raised in the centre of the Piazzale della Steccata. The statue of the celebrated painter stands upon a square pedestal of three tiers resting upon a plinth, and adorned by cornices and mouldings, the highest one of which serves as the base for the statue, while the lower two form a public fountain. The plinth, which is a square, measures 9 ft. 9 inches on each side. At the eastern and western faces, just above the first tier, are supported two light and elegant basins, in the form of shells, for receiving the water flowing from the mouths of two female heads, sculptured in half-relief. The other two faces bear, in similar plans, the following inscriptions: — the north side, "Il comune cresse"; the south side, "Contribuì alla spesa l'Ord. Costantiniano." The arms of the municipality of Parma are sculptured upon the eastern face of the pedestal; those of the Order Constantiniano di San Giorgio, who contributed towards the erection of the monument, on the western face. Upon the northern side of the pedestal is carved the inscription, "Al Parmigianino"; upon the southern, MDCCCLXX1X.

The statue of Parmigianino, 7 ft. 3 in. high, rises from the pedestal at an elevation of 12 ft. 6 in. from the base. The figure of the painter is in the attitude in which we illustrate it. The left foot rests on the step of a kneeling-stool (known in Italy by the name of *genuflessorio*), upon the outer face of which is sculptured the winged head of an angel. The painter holds in his right hand a brush, in his left the palette; the latter arm rests upon the top of the kneeling-stool. He is dressed in the costume of his time (Mazzola was born 1503, and died 1540),—long stockings, under-waistcoat, and wide and long robe (*zimarra*). The expression of the face is reproduced with great fidelity in our illustration. The design of the monument is by Professor Giovanni Chierici, a Parmese sculptor. The monument is in Carrara marble and granite, the latter being chiefly employed for the fountain arrangement. The cost of its erection was ridiculously low, only 9,000 lire (360*l*.); but this is explained by the fact that the marble was gratuitously supplied by the Accademia di Belle Arti of Parma, with the exception, however, of that for the statue, which was provided by the sculptor at his own expense.

LEEDS ARCHITECTURAL SOCIETY.

ON Saturday afternoon last the visit of the society was to Halifax. The party were met at the station by Mr. John Leeming, of the firm of Leeming & Leeming, architects, &c., Halifax, and conducted over the principal parts of the town.

Amongst the buildings visited were the parish church, recently restored by the Messrs. Scott at a cost of about 20,000*l*.; Square-road Congregational Chapel, recently restored by Messrs. Leeming; the Higher Board School, Prescot-street, erected at a cost of about 6,000*l*., from plans by Mr. R. Horsfall, of Halifax; Heath Grammar School, erected at a cost of about 10,000*l*., by Messrs. Leeming; Haugh Shaw Board School, also by Messrs. Leeming, and which cost about 6,800*l*.

The town-hall was the last building visited, when the opportunity was taken on the part of the visitors to express their thanks to Mr. Leeming. It is the intention of the society to again visit Halifax, as many buildings were necessarily left unseen, owing to the shortness of the visit.

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NEW SCHOOLS AT ST. ALBAN'S.

THE new school buildings erected by the School Board here are now in use; they afford accommodation for 250 boys and 300 girls and infants. The new boys' school is in the Hatfield-road, and is about 60 ft. north of the old school belonging to St. Peter's parish, which was handed over to the School Board when the latter was formed. A playground extends on the north of the new structure up to St. Peter's Churchyard,—the average size of this ground being 110 ft. by 130 ft. The plan of the school is so arranged that accommodation for an additional 100 children (making 350 in all) can be provided at a future time without disturbing the present buildings to any extent. The site not being a prominent one, the architects were instructed to make the building of good outline, but very simple in detail. The walls externally are faced with a greyish-coloured brick obtained from Pepperstock; the roofs are covered with red plain tiles. A shelter-porch, under which the children may assemble before school-hours in bad weather, gives access to the school-porch, from which the schoolroom and the class-rooms are reached. The schoolroom is 62 ft. by 22 ft., 14 ft. high at the eaves, and about 20 ft. from the centre. There are also large recesses for cupboards, &c. This room will accommodate 130 children. The principal lighting is by a range of windows in the north wall, and there are also windows to the east and south. This arrangement, by which the principal lighting is derived from the north, applies to the main rooms in all the three schools. Each class-room is intended for sixty children, and is 29 ft. 4 in. by 22 ft., and of the same height as the schoolroom. The entrance to the building can be reached from each of the rooms without it being necessary to pass through any other room. The cloak-room and lavatory are sufficiently large to provide for the total number of 350. Wood-block floors, laid herringbone-wise, have been used for the school and class rooms of all the schools, both for upper and lower floors. In the upper floors the blocks are 20 in. long, so as to suit the joists, and bedded on dry pugging and fine sand. On the lower floors they are laid on cement concrete, finished with a floated face of cement. The latrines consist of six water-closets for the boys and one for the master, and a range of urinals with rubbed slab slate channels, foot paces, divisions, and wall linings. The closets have louvres in the front enclosures, and are covered with skylights, and in them Messrs. Bowes Scott & Read's patents have been applied,—the glazed earthenware tubes being jointed with Stanford's patent joints. Flushing is arranged for by means of Field's self-acting annular syphon, each flush being 100 gallons. None of the floors in the school and class rooms are graded, but the desks are of different heights. The "Invincible" school-desks, made by Messrs. Philp, of Atlas Works, Liverpool, have been used in this school.

A site on the west side of the Alma-road was purchased in order to erect schools for girls and infants, much wanted in the large neighbourhood which has grown up between the Marlborough-road and Midland Railway Station. As the surface of the ground was considerably below the level of the Alma-road, the infants' school was put at the lower level and a girls' school over it. Both the playgrounds are reached by sloping ways, so that there are no external steps. The houses in the Alma-road are of a good class, and the Board, therefore, directed that a good-looking building should be erected, which would be an ornament to the neighbourhood. Box-ground Bath stone has been used for stone sills, mullions, and lintels to the windows. There are also moulded stone string-courses, water-tables, &c. The bricks are of a dull red. Plain tiles cover the roof, with barge tiles and finials. The playground for infants, in the northern portion of the site, is about 35 ft. by 100 ft. At the west end of the building is a play-shed for infants, 20 ft. by 22 ft., which will also serve as a shelter-porch. The schoolroom for infants is 44 ft. by 19 ft., and 14 ft. high. It is fitted with a gallery of raised seats at the west end, providing accommodation for sixty children; there are also desks for the elder children. South of the schoolroom is a babies' room, 17 ft. by 16 ft. On the upper floor is the girls' school, the schoolroom being 68 ft. by 19 ft. 9 in. There are also large recesses for cupboards, desks, &c. It is 14 ft. high at the eaves and 19 ft. in the centre. The class-room is on the south of the schoolroom, over the babies' room. This school is reached from the playground level by a stone staircase constructed in the most approved manner with short flights of easy steps, half-landings, and solid walls between the flights. The girls' playground is on the south of the buildings, and is about 40 ft. by 120 ft. It is reached from the Alma-road by an inclined path. The sanitary arrangements of these schools are especially adapted to their requirements, but are in principle much the same as those in the Hatfield-road school.

The heating in all the schools and class-rooms is by Shorland's Manchester grates. Fresh air is also supplied to the rooms by what are known as Tobin's ventilators, fitted with perforated zinc, and with valves and lids for regulating and shutting off the supply. The spaces above the collars of the roofs form ventilating chambers. There are also extraction-flues in the chimneys, Boyd's iron flute plates being built in next the smoke-flues. All the rooms, staircases, &c., are lighted with gas.

The accepted tender for the Hatfield-road school amounted to 2,210*l.*, and that for the Alma-road school to 2,483*l.* The Board, however, have incurred further outlay in order to secure greater perfection in regard to the heating, ventilating, and sanitary arrangements, &c. There have besides been the fittings to provide for.

The contractor for the Hatfield-road School is Mr. D. Ireson, of Waterloo, Northampton, his representative on the works being Mr. F. W. Austen, and the foreman Mr. Samuel Bayes. For the Alma-road School the contract of Mr. C. Miskin, of St. Alban's, was accepted, his foreman on the works being Mr. Henry Hilliard. All the buildings have been designed and superintended by Messrs. John & S. Flint Clarkson, of London and St. Alban's, the architects to the School Board.

EAST SUSSEX, HASTINGS, AND ST. LEONARD'S INFIRMARY ARCHITECTURAL COMPETITION.

QUESTIONS open to serious consideration relating to the above competition resolve themselves into grave and complicated difficulties, some of which cannot too soon be made public to restore the confidence to so many able and generous minds who have placed a host of wealth and genius into the hands of the committee of management in good faith that justice and merit would be the reward.

The conditions given, or rather sold, out to the competitors or those who desired to take up the invitation, were clear and pointed in their requirements, with certain equally clear and prominent stipulations as to the way such drawings were to be prepared and to be received in competition; with equally precise and strict points which should disqualify any transgressions being made or attempted. Such being the case, no doubts could exist in the intentions put forth to regulate the order and comparative character of the works when submitted.

Any one acquainted with the conditions could not fail observing at the first glance into the convenient rooms and looking at the magnitude of drawings sent in and exhibited, that a grave breach of faith had crept into them,—I allude to the colours on the plans and sections as violating the conditions which alone should disqualify those who took such liberties.

The conditions state:—"The geometrical elevations to be without colour or shading of any kind, except a flat tint of Indian ink to the door and window openings, and on the roofs if desired. *The walls, &c., of plans and sections to be shown in Indian ink.*"

The words italicised, in justice to the many competitors who sent in untinted plans, should be a safeguard that they alone could be dealt with in the competition. See 7th section, schedule B, of the conditions. The above is clear and decisive, and should be a protection, not a snare; for there cannot be the slightest doubt a plan deftly tinted puts those not tinted at a discount, and, though equally worthy, they do not get so carefully looked into, nor are they so readily impressed upon the minds of others. This should have been so treated by the assessor beyond a doubt, or otherwise his judgment is null and void.

The competitors may have been advised that such liberties would be allowed, but in the name of love of justice, with such conditions in print, who has the power to say ay or nay to such a privilege without the full knowledge of all concerned? They have acted, presumably, upon the slender, though courted, compliance, for I cannot believe any one would run the risk on his own responsibility. By such acts they rightly deserve exclusion for taking such advantage, well knowing it must be to their gain and attraction if passed over. I venture to think the faithful ones should have the protection which I hope it is not too late to give.

I will next refer to the premiated designs 1, 2, and 3, all of which should be out of the competition for "violation of conditions" on the first ground alone, but I will go further as to their merits, looking into their fitness for such an institution, and I am sure it will be clearly seen that the assessor must have treated the conditions as waste paper, and overlooked the special requirements of a hospital for sick and infirm patients. All of the three premiated designs have the out-patients' department in the basement. As one accustomed to hospital work for twenty years, I know such an arrangement is fatal to any proper working of such a department. What proportion of patients are able and fitted to go up and down stairs? It is as much as many can do to crawl, if I may use the expression, and many others have to be supported or carried.

Another defect in No. 1. The children's wards have no water-closets but by crossing a wide main corridor, leaving their wards, of course, and thus being exposed. There are only two bath-rooms on each floor, and those very small, to accommodate thirty-eight patients, mixed together,—that is, adult, children, and dirty cases; this should be enough to condemn the plans at once. The wards are fairly well arranged, but at the sacrifice of the working part. There are but two nurses' rooms to six wards, one on each side, which have to serve all purposes,—quite insufficient. There are some good points in the plan, but the bad are sufficient to condemn it.

Premium No. 2 goes to a very industrious aspirant, who actually sends in no less than three complete sets of designs, all tinted, but without much else to recommend them, as they contain a mixture of bad points. The rise of the ground 19 ft. appears to have been forgotten, and not seen, as there are numerous windows on the ground-floor opening into *earth*, from which there is no possible chance of gaining any light, as the ground would be 5 ft. above the first-floor level. Where was the assessor? Could he have been prompted by charity at others' expense? The areas at the back are all close and confined, making, as it were, dark wells for the admission of light and air. The kitchen arrangements are absurdly small. The *post-mortem* and dead house are placed in the front, next to White Rock-place, exposed to the full sun and public gaze, and obliging all bodies to be conveyed into and through the basement. The arrangement of wards is incomplete, having no water-closets connected with them, and only four to thirty-nine patients, without any separation, except the sexes, for each ward and children, and to get to them the patients must leave their wards, cross main corridors, and then have some distance to traverse before they reach them. This is most painful to contemplate, and more so when it is qualified with the second premium. The baths are equally small, two to thirty-nine patients, all mixed,—that is, for general use to adults, children, dirty, and contagious cases. Nurses' rooms,—small and inconvenient, I think,—one to four wards. Staircases poor and cramped.

Premium No. 3.—The out-patients' department is in the basement; the patients have to get down stairs, and after treatment perambulate a circuitous route upstairs into the hospital for medicines. This is a violation; the "out-patients were not to enter the main building." It could never work, as not eight patients in ten could do it. Wards, baths, and water-closets are badly arranged. Dark corridors, ventilated through water-closet,—lobbies at each end. *Post-mortem* in the basement, and very dark approaches. This plan is a shade better than Premium No. 2, but has much the same character of faults.

Finally, their cost, which must not exceed a stipulated sum more than 10 per cent.,—a very ready test, you will say, and I to that agree.

First premium estimate, 25,000*l.*: a modest sum, considering that at 9d. per foot cube, for

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which possibly it might be built, but not for less.

Second and third premiums, both very low, 15,000*l.* and 17,000*l.* thereabouts: a startling difference, even with the 10 per cent added, and the buildings themselves are more pretentious than in the first design, and certainly quite as expensive.

All these points, faulty and unjust as they are, are combined in the three premiated designs. What about the others?

They comprise a wealth of ingenuity not met with in the foregoing, though I regret that many, which have some excellent points, utterly fail in making a building fit for sickness and infirmities. I, however, believe there are some few most worthy designs to choose from, and which will be found nearly approaching the acme of the conditions, and should not be overlooked. I allude to untinted plans of the highest merits, embodying most of the best features of a modern hospital.

I will not venture to direct attention to these, for if the conditions are regarded they can be readily seen; but merely for the love of fair play and justice to those who are so unfortunate as to be shifted, but not beaten, I make known the facts, in the hope that it will be followed by restitution of rights to those more worthy.

FAIR PLAY.

THE NICHOLSON INSTITUTE, LEEK.

THE site of this building, which is quite central, lies upon the north side of Stockwell-street, and comprises a ground area of more than 10,000 ft., including the space occupied by an interesting stone house of the seventeenth century, which it was fortunately found possible to retain without detriment to the convenience and utility of the new edifice.

A quadrangle is thus formed between the edifice and the street, in which the hum and rattle of the outer world will lose the track of the tormented student seeking sanctuary in the Institute. This space may receive, too, such treasures of hoary vestiges and wrecks and waifs of time as cannot well be offered "logement à pied ou à cheval." By taking down a portion of an adjoining modern block of buildings ground is obtained for a spacious entrance with foot and carriage gates of wrought iron, supported by massive stone piers.

The plans of the Nicholson Institute promise a building of a severe Classic Renaissance character. The materials adopted by the architects are thin hard-fired local bricks and red Roche and Aston stone, with brown Broseley tiling upon the roofs. All the floors will be of wrought-iron girders and cement concrete (covered with wood block paving), quite impervious to fire, noise, or other risks.

The leading feature of the principal front, which faces south into the quadrangle, is the tower, containing the portico and staircase, and rising to a height of 100 ft. from the street. Its domed roof will be entirely covered with copper. In the upper stage it has large oval windows, enclosed by carved pilasters and swags of foliage, and the lower stage is filled by the richly-carved entrance-doorcase and the pedimented window upon it, together 40 ft. high. To the left of this front we have the main gable, 70 ft. high, curved in outline, and with a carved pediment, in harmony with the tower decorations, flanked by two small turrets, terminating in stone domes. At the foot of this gable is the large bay-window of the committee-room and rooms beneath. The remainder of this façade, between the tower and the gable, contains large windows lighting the hall, &c., and bearing upon four large medallions under a carved pediment the effigies of eminent writers or painters. The eaves are finished by an open balustrade surmounted by urns.

The windows are of ample size, transomed and mullioned, and glazed with clear glass in lead quarries. The other fronts are simply treated to follow the general lines of the south front.

Internally the building has three floors, the central one being some 9 ft. above the street; the ascent is made partly by steps and partly in the incline of the approach.

On the lower floor is placed the school-of-art accommodation, entered separately from the east side; also the library basement and the stokeries, storage, lavatories, &c. Sloping north lights are secured for the art class-rooms.

The central floor comprises the entrance-hall, &c., reading and news rooms and committee-room, and the library, which runs up through both stories, and is lighted entirely by a large domed glass roof. The manifest advantages of this position for the library are that none but the attendants have actual access to the book-shelves and presses, which are carried upon open iron galleries round this lofty room; the attendants' and readers' respective occupations do not clash; and the books themselves are isolated and preserved from the damage caused by the vitiated air which must accumulate near ceilings before it can be drawn off by ventilation. Mr. Conell (the Liverpool librarian) stated at the annual meeting last week of the Library Association that "the money value of replacing bindings of books,—attributable to the effects of gas,—was enormous." The library, with its contents, can be fully seen from the other portions of the building through lofty openings, fitted with glazed screens.

On the upper floor are the picture-galleries and museum, with landing and cloak-room. The major picture-gallery is to have a platform for chamber concerts or lectures, upon which occasions chairs will be sent up to the room from the storage by a lift. All this floor will be lighted by clearstories at a suitable height, to obviate any danger of glitter on the pictures from the incidence of the light, this method of lighting being regarded as more comfortable and substantial in appearance than the glass shed roofs frequently make use of.

The following is a list of the accommodation and its extent:—

	Width.	Length.	Height.	Area.
Large picture-gallery	25 ft.	66 ft.	32 ft.	1,650 ft.
Two smaller galleries	16 ft.	19 ft.	22 ft.	608 ft.
Museum, &c	25 ft.	56 ft.	32 ft.	1,400 ft.
Reading-room	25 ft.	50 ft.	15 ft.	1,250 ft.
Newsroom	25 ft.	40 ft.	15 ft.	1,000 ft.
Library	20 ft.	40 ft.	45 ft.	800 ft.
Committee-room	18 ft.	25 ft.	15 ft.	450 ft.
Hall	17 ft.	52 ft.	15 ft.	884 ft.
Elementary art-school	25 ft.	37 ft.	13 ft.	925 ft.
Second ditto and master's stores	20 ft.	37 ft.	13 ft.	740 ft.
Advanced art-school	24 ft.	25 ft.	13 ft.	600 ft.
Entrances, lavatories, library basement, storage, &c.				2,000 ft.
			Total super.	11,707 ft.

The works are being carried out to the plans, &c., of Messrs. W. Sugden & Son, architects, of Leek, and under their superintendence, by Messrs. Inskip, builders, Longton; Mr. Philips, plumber, Leek; and Messrs. Haden, engineers, Manchester.

The amount of Messrs. Inskip and Philips's contracts (exclusive of cost of site, heating, and ventilation, and all fittings) is 8,683*l.*

RESTORATION OF THE MANOR HOUSE, EVERLEIGH, WILTS.

THE Manor House, Everleigh, the ancestral home of the Dugdale Astleys, and traditionally a residence of the old Saxon king Ina, whose hunting-lodge is said to have stood near the Sidbury encampment, was totally destroyed by fire at Christmas last. Fortunately, the billiard-room, ballroom, orangery, conservatory, and an extensive range of servants' offices and stables were saved, although considerably damaged. This mansion (for the original Manor House is now a comfortable hostelry and hunting quarters) is supposed to have been built by Sir Ralph Sadlier, to whom the lordship was granted by Henry VIII. Sir Ralph was afterwards falconer to Queen Elizabeth. His portrait and all the family pictures, with one exception, were preserved, and will have a place in the new building. The old drawing-room,—a handsome and spacious chamber, with carved oak panelling, and a decorated ceiling in the style of the period,—was totally destroyed. The romantic and picturesque surroundings of the house, which nestles in a well-sheltered and secluded spot in the vicinity of Stonehenge, Tedworth, and Savernake Forest, invest the place with charms which but few possess.

The work of restoration was commenced in February last. The new building presents a façade of about 110 ft. by 56 ft. in depth. The reception-rooms, which are all on the ground-floor, are spacious and conveniently placed on each side of a corridor, 8 ft. wide, extending the full length of the building, and comprise dining-room, large and small drawing-rooms, library, morning-room, study, business-room, lavatory and gentlemen's water-closet, housekeeper's-room, butler's pantry, back stairs, brushing-room, lamp-room, &c. The entrance-hall is in the centre of the façade; it is entered from a portico, having an inner lobby and screen, and is shut off from the corridor by an elliptic-headed screen, in three bays, the side bays being filled in with panelled and moulded framing to agree with that in the hall. The principal staircase, which is of oak, having a panelled oak dado and soffits, with carved and moulded newels, is in the rear of the entrance-hall. The hall is open to the roof, is finished with a richly-panelled and coved ceiling, and is lighted from the roof, in addition to windows on the landings. The principal rooms, corridor, and staircase have panelled and moulded dados, and the large bay windows in the dining and drawing rooms are finished with pilasters and panelled and moulded elliptic arches. The chimney-pieces are specially designed, those for the principal rooms being of an elaborate character, and the ornamental ceilings of these rooms are being executed in fibrous plaster by Messrs. Jackson. The family and guests' bed-rooms, bath-rooms, water-closets, housemaids' closets, upper servants' rooms, &c., are on the first-floor, and the bachelors' bed-rooms are placed in the attics. The works have been carried out with great energy and despatch by Mr. Stanley G. Bird, of Upper George-street, Edgware-road, under the direction of Mr. John Birch, architect, of John-street, Adelphi.

UNIVERSITY COLLEGE, BRISTOL

WE would direct the attention of our readers to the prospectus of this college, which has been published in our advertising columns. It will be seen that, like the similar colleges at Manchester, Leeds, Birmingham, &c., the lectures comprise all the branches of a liberal and scientific education. The erection of new buildings, which will be completed before the close of the current year, will give increased facilities for the study of science. The chemical department now contains accommodation for nearly fifty students, and is thoroughly equipped with the latest improvements for teaching which are in use in this country or on the Continent. Lectures are delivered on pure chemistry, as well as on certain branches of applied chemistry. The physical and engineering departments are also provided with facilities for laboratory work. A special feature of the engineering department is the arrangement by which students attending lectures at the college during the six winter months are enabled to gain practical experience during the summer months, when they work as pupils in the offices and workshops of leading engineering firms in the neighbourhood. The instruction in experimental physics is kept abreast of the rapidly-increasing requirements of the age, and arrangements are now perfected for the thorough training of students as electric engineers,—a profession for which the recent development of electric discovery opens good prospects.

CASES UNDER BUILDING ACT.

FLUES.

AT Hammersmith, Frederick Davis, a bellhanger, was summoned by Mr. Knightley, the District Surveyor of Hammersmith, for cutting away a portion of a flue contrary to the rules of the Building Act. Mr. Knightley said that on the 25th ult. he went to Bute House, Brook-green, and found, on removing the skirting-board near the chimney-piece, that a vertical chase had been cut in the plaster to admit the tube for the wire for the bell. It was a very important matter, as he found that workmen often destroyed the plaster and so endangered the safety of the fabric. He would be satisfied with a nominal penalty, in order to show workmen that it could not be done with impunity. In the present case the external "rendering" or plastering had been cut down to the brickwork, which was left exposed. In the event of the sweep's brush passing through the flue and rubbing off the mortar, the house would be endangered. The defendant denied interfering with the plaster, and said it was all right when he left it.

Mr. T. Chamberlain, the builder, was called by the defendant, and he stated that Mr. Knightley was correct to a certain extent, but he submitted that the Act did not apply to the case, and that he ought to have proceeded in another way.

Mr. Knightley referred to the rules, and contended that the act done amounted to the cutting away of a portion of the flue, which the Act prohibited.

Mr. Paget thought the Act did apply, and fined the defendant 5*s.*, with 2*s.* costs.

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VARIATIONS IN DEATH-RATE OF CERTAIN LARGE TOWNS.

	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1870 to 1875.	1875 to 1881.	Difference.
Birmingham	97·0	105·5	97·5	105·1	113·5	112·0	95·8	101·7	107·6	93·3	87·3	84·4	105·1	94·9	10·2
Brighton ...	116·7	110·5	102·4	91·7	97·1	107·3	96·1	92·2	104·4	93·7	97·1	93·1	104·3	95·7	8·6
Liverpool ...	114·9	122·6	94·8	90·2	111·8	95·8	90·2	91·6	101·7	93·7	94·4	93·0	105·0	95·0	10·0
Manchester	103·1	107·9	99·0	103·8	105·2	103·4	100·7	98·3	100·7	97·6	92·8	87·9	103·7	96·3	7·4
Salford	94·3	111·4	92·4	101·9	100·8	104·8	116·5	96·5	99·0	97·6	102·3	82·6	100·9	99·1	1·8
Sheffield ...	106·2	113·3	104·2	103·0	107·3	99·4	97·0	92·2	106·2	91·4	91·4	84·4	105·5	94·5	11·0

SIR,—In reference to the recent discussion as to the death-rate of certain English towns, I was led to calculate the above table.

The mean death-rate of each town by itself for the whole period is put equal to 100, and the yearly death-rate then calculated as a percentage on that basis.

The table would, therefore, read thus:—In 1870 the Birmingham rate was 97 per cent. of the twelve years' mean, but next year it rose to 105·5 per cent., falling again in 1873 to about the rate of 1870. At the end of the table the years are grouped in two periods of six years each, and we find, taking the average of the first period, the Birmingham rate was exactly the same as it had been in 1873; when the second period is, however, taken, the average of the six years is less than at any time during the first period. The difference between the two periods is expressed in the last column, showing that the rate has been reduced in every case; the amount, however, varying considerably, the basis of calculation being throughout the twelve years' mean of each town by itself.

The population of these towns varies so much, and with regard to Manchester an actual decrease has taken place in the time covered by the table, that in the following table the population of the smallest town and its "difference" are each put equal to 100, and the others reckoned as percentages:—

	Population. 1871.	Population. 1881.	Improvement.
Birmingham	371·8	371·9	118·6
Brighton	100·0	100·0	100·0
Liverpool ..	423·8	513·6	116·3
Manchester	379·8	317·6	86·0
Salford	135·0	167·1	20·9
Sheffield.....	259·5	264·5	127·9

Thus we see that Liverpool, though containing more than five times the population of Brighton, shows a rate of improvement somewhat higher, and not much less than six times the rate of improvement in Salford.

OWEN ROE.

COMPETITIONS.

Walsall Public Buildings, Bloxwich.—At a meeting of the Walsall Town Council on the 4th inst., out of the plans submitted by four architects for the proposed public buildings at Bloxwich, comprising police-station, reading-room, and stabling and cart-sheds for the sanitary department, the General Purposes Committee submitted for the decision of the council those prepared by Mr. S. Loxton and Mr. F. E. F. Bailey respectively, each set being within the settled cost of 1,200*l.* Alderman Lindop proposed, and Councillor Beebee seconded, the adoption of Mr. Loxton's plans. Alderman Brewer expressed his preference for Mr. Bailey's, but declined to move an amendment, and eventually the proposition was carried, ten members voting in its favour.

The Wallace and Bruce Memorial, Edinburgh.—The members of the Treasurer's Sub-Committee on Properties, of the Edinburgh Town Council, met on the 8th inst., in the Waverley-market, for the purpose of inspecting a number of competitive designs for the memorial to Wallace and Bruce, proposed to be erected with a sum of money bequeathed to the Corporation by the late Captain Hugh Reid for the purpose. Captain Reid's will (according to the *Scotsman*) provided that 1,000*l.* should be placed at interest in the Royal Bank of Scotland, which interest was to be paid to the testator's widow during her lifetime, after which the principal and interest should accumulate as a fund for twenty-five years, to assist in erecting some memorial to the two national heroes. The will further suggested that the monument should take the shape of "an ornamental piece of water in the North Loch, with a fountain in the centre, and colossal statues in bronze of each hero in conference." The stipulated twenty-five years posterior to Mrs. Reid's death having elapsed, the Corporation intimated that they desired to receive, in open competition, designs of the figures for the memorial, and among the conditions imposed on the competitors were the following:—That the sum to be allowed for the completed work shall be 2,000*l.*; that the competitors whose designs are second and third in order of merit shall receive, out of the city's common good, premiums of 30*l.* and 15*l.* respectively; but in the event of no design being accepted, no premium will be awarded; that the figures of the memorial shall be colossal, not less than 12 ft. in height, and that those in the competitive models shall be of the uniform height of 3 ft.; and that, while following generally the indications given by Captain Hugh Reid as to the site and character of the memorial, the treatment of the designs in detail, as well as the suggestion of the most suitable site within the locality indicated by the terms of the bequest, shall be left to the discretion of the competitors. Seven sets of figures have been put forward for competition, and, while varying considerably in style and in merit, the majority are creditable pieces of sculpture. In most cases the warriors are represented as clad in mail and armed, the Knight of Elderslie with his famous double-handed sword, and his compatriot with the short battle-axe wielded with such deadly effect against the English knight at Bannockburn. Meanwhile, the names of the respective artists have not been disclosed, the models being merely distinguished by numbers and mottoes. After the committee had inspected the designs, it was decided to adjourn the meeting without coming to a decision, and to invite the members of the Council to make an inspection and express an opinion regarding the merit of the several designs.

The West Cumberland Liberal Association, Workington Branch.—The committee having advertised for plans for buildings comprising a large hall to seat 2,500 people, a club-house, a post-office, shop, and offices, the designs sent in by Mr. T. Lewis Banks, of 23, Finsbury-circus, London, and Whitehaven, have been selected.

STONE-DRESSING BY STEAM POWER.

ACCORDING to the *Baugewerkszeitung*, the use of facing stones of terra-cotta will, in future, experience the competition of natural stone dressed by steam power. The new invention of Herr Schmidt has apparently been proved by trials to combine simplicity of mechanical arrangement with economical and rapid working. Former attempts in this direction have been based on the idea of imitating stone-dressing by hand, and the machinery has been devised for the purpose of producing a smooth surface by the removal of all uneven portions; but Herr Schmidt has worked on a different plan. He has applied the principle of a saw with as great a power as can be obtained, to the production, at the same time, of two surfaces ready for use. The inventor seems to have been, to some extent, influenced by the stone-boring machine, which was the means of accomplishing the gigantic tunnelling works of St. Gothard and Mont Cenis. He seems to have reasoned, that by the judicious application of the principle of this machine it ought to be a matter of no insuperable difficulty to produce a stone-dressing machine able to supersede manual labour.

A provisional machine, of limited size, was constructed, in which a small steam cylinder imparted a vertical striking motion to a pair of steel chisels of equal width. A stream of water was used in conjunction with this appliance, and as the chisels penetrated the block of stone, two regular and even surfaces were produced. This trial was made with the hardest syenite granite.

An ordinary stone-dresser, working with a hand saw, can produce in a day of eleven hours, according to the journal named:—

Square feet of cut surface.	
4·30 to 6·45	in sandstone.
1·82 to 2·15	in marble.
0·21 to 0·32	in granite.

The smallest machine on Herr Schmidt's principle, with one small steam cylinder, can produce in the same time 43 to 65 square feet of cut surface of granite, and, therefore, represents the daily labour of 200 workmen. It is the same thing to the machine whether hard granite or soft sandstone is given to it to cut, but the quantity of work done varies, of course, according to the hardness of the material. The machine is, therefore, a reliable test of the exact comparative hardness of various descriptions of stone.

The piston only requires a limited stroke of 1½ in. to 2 in., and gives about 1,000 blows per minute without the chisels heating, as a continuous stream of water serves the double purpose of keeping them cool and of carrying away the minute particles of stone, &c., which are constantly accumulating. This is a considerable gain to the workmen from a sanitary point of view, as there is no stone dust thrown off. There is provision made for the stone dust being deposited by the water which flows away, in such a manner that it can be easily removed. It is used in the ceramic industry, and is, therefore, of some value.

The inventor delayed bringing his machine in a prominent manner before the industrial public until it had been subjected to the most difficult tests.

SEWERAGE AND DRAINAGE WORKS.

Nottingham.—At the meeting of the Nottingham Town Council on the 4th inst., the Beck Valley Sewer Joint Committee reported to the council as to the scheme for dealing with the storm waters in the Beck Valley district as follows:—The committee report that, pursuant to the order of the Town Council made on the 3rd day of April, 1882, they have again seriously considered the question of providing for the carrying away of the storm waters in the above district. The committee having had before them the particulars of the rainfalls which have occurred during the past summer, are compelled to come to the conclusion that some scheme for dealing with the floods should be carried out without further delay. Your committee refer the council to their previous report on this matter, dated March 1st, 1882, in which it was stated that a scheme for dealing with 1 in. of rainfall per hour would cost about 32,000*l.*, and that a scheme for dealing with 2·8 in. per hour would necessitate an additional outlay of only 9,000*l.* Considering that by the expenditure of the extra 9,000*l.* nearly three times the amount of rainfall would be carried off, your committee feel bound to recommend the council to carry out the scheme capable of dealing with the largest recorded rainfall of the district, which is estimated to cost about 41,000*l.* During the illness of the borough engineer, your committee called in the advice of Mr. Tarbotton, and asked him to report generally on the whole scheme. He has reported to your committee, and has also made a thorough inspection of the line of route in company with the borough engineer. Your committee, having fully considered the matter, recommend the council to adopt the scheme drawn up by the borough engineer, the plans of which are now laid before the council, and that your committee be authorised to carry out such scheme at a cost of 41,000*l.* The report was adopted.

Burton-on-Trent.—At a meeting of the Burton Town Council on the 6th inst., the Highways and Sewers Committee recommended that the giving of notices to treat for the land scheduled in the provisional order for the works of sewage disposal be deferred for the present, and that Mr. E. Daniels, of Needwood-street, should be appointed clerk of works in respect of the construction of the engines, boilers, &c., for the sewage works. In moving the adoption of the report, the Mayor referred to the question of the drainage of Stapenhill and Winshill. The matter had not been neglected since the last meeting, but the committee had given it consideration, and had devoted considerable time to the inspection of the most difficult places. As to the lands required for sewage works, the committee recommended that the Estates and General Purposes Committee should proceed

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with the purchase of the 300 acres for which they obtained an Act of Parliament, and that the purchase of the additional land for which they obtained a provisional order should stand over for a time. From a letter which they had received from Mr. Mansergh, the engineer, it appeared that 300 acres would be as much as he could deal with for some time, and they thought it was desirable they should wait to see how things turned out before they proceeded further. Alderman Wardle said he could not vote in favour of the report as it stood with reference to the taking of land for sewage works. The committee had come to the determination that some 450 acres (he forgot the exact figures) were absolutely necessary for the work, and he argued that it would be more economical to secure the whole of that area at once. The report was, however, agreed to.

Shirley (near Southampton).—At the meeting of the Shirley and Freemantle Local Board of Health, on the 6th inst., a letter was read stating that Lady Mill would not sell the land required by the Board for the proposed sewerage works on any terms, and that every means would be taken to oppose the acquisition. The chairman (Major-General Lewis) said the only way, then, to get possession of the land was by exercising compulsory powers. They could not do anything yet until they had plans of the proposed works, and until the scheme was sanctioned by the Local Government Board, and then they could take the necessary steps to get possession of the land. Subsequently the Chairman stated that Dr. Sampson and himself, who were appointed as a deputation to Hertford to see the sewage works, went there on the 19th ult., and they had drawn up a report which had been submitted to the Sewage Scheme Committee. He might mention that they were of opinion that the process in use there was an efficient one, the chemical agents being crude sulphate of alumina, copperas, and lime. Whether the system would be adapted to the Shirley and Freemantle district would be dependent upon the cost at which these materials could be procured. With Dr. Sampson, he (the chairman) was of opinion, provided they could procure them at a reasonable cost,—and they would require at Shirley a lower degree of purity than at Hertford,—that the process would suit the Board very well. On the proposition of Mr. Stewart, seconded by Mr. Inder, it was decided to leave the matter in the hands of the Sewage Committee to find out the cost of the alumina, and to get the Engineer to the Rivers Purification Association to report on the subject.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

4,219. J. B. Shaw, Tunstall. Decorating bricks, &c. Sept. 5, 1882.

4,232. J. Hudson, Bolton. Apparatus for holding and releasing cords for venetian blinds, &c. Sept. 6, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named:—

Sept. 5, 1882.

2,097. R. Guelton, Brighton. Producing artificial marbles, &c. May 4, 1882.

2,120. W. McGill, London. Urinals, &c. May 5, 1882.

Sept. 8, 1882.

2,121. T. W. Helliwell, Brighouse. Water-closet basins and means of flushing the same. May 5, 1882.

2,209. L. J. J. Kelly, London, and C. B. Lindsay, Blackheath. Graining and ornamenting surfaces. May 10, 1882.

3,614. T. Hyatt, London. Illuminating gratings, &c. July 31, 1882.

ABRIDGMENTS OF SPECIFICATIONS.

Published during the Week ending Sept. 9, 1882.

424. M. Ingram, Manchester. Apparatus for preventing waste of water from lavatories and baths. Jan. 27, 1882. Price 2d.

A three-way tap is used on the water-supply pipe, which first fills a receiver of the required size, and when the tap is turned to fill the bath, &c., no more water will enter the receiver. (*Pro. Pro.*)

437. J. Imray, London. Effecting fireproof separation of the stage and proscenium in theatres. (Com. by K. Pfaff, Vienna.) Jan. 28, 1882. Price 4d.

The curtain consists of horizontal strips of sheet iron bent to a curved shape, the concave sides of which are towards the proscenium. These are riveted together, and the lateral edges are supported by vertical bands. This curtain travels in a wide groove. (*Pro. Pro.*)

468. E. Wilkins, London. Apparatus for sustaining sliding window-sashes, &c. Jan. 31, 1882. Price 2d.

In each side of the frame is a recess, in which is pivoted a tongue-piece kept projecting towards the sash by an indiarubber pad. Above this is a roller which, when the sash commences to fall, jams in between the tongue and the side of the sash, which is thereby sustained. (*Pro. Pro.*)

469. J. Parkinson, Caton. Boilers and furnaces for heating greenhouses, &c. Jan. 31, 1882. Price 6d.

These have water-spaces all round, both sides, front, back, and top. Above the crown of the fire-box are three arched water-shelves alternately connected to the front and back water spaces, so that the products of combustion pass backwards and forwards between them on their way to the chimney. The flow-pipe passes vertically through and communicates with the centre of each of these water spaces.

482. E. R. Wethered, Woolwich. Latches and locks. Jan. 31, 1882. Price 6d.

A weighted lever handle is used to project the bolt forward. A notch is formed in the bolt, in which a stud engages when the bolt is withdrawn, and when the door is shut the fore-end of the bolt is lifted by an incline on the sticking-plate, which frees it of this stud, and the handle presses forward the bolt.

544. G. Otway, Brixton. Apparatus for cutting or dividing bricks, tiles, or slabs from plastic clay. Feb. 4, 1882. Price 8d.

The stream of clay is cut as it passes on to the cutting-table into the exact lengths required to form a certain number of bricks. This is effected by a rack with two sets of teeth, to which the pusher is attached, which slides in a pair of parallel guides. The rack is set to the required length, and pushes the required quantity of clay beneath the guillotine.

2,302. J. Mitchell, Paris. Manufacture of decorative transparencies for windows, &c. May 16, 1882. Price 2d.

These are made of thin sheet gelatine of different colours. The several pieces are joined together by strips of dark coloured paper attached thereto by glue, &c.

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street.

"WHAT IS PROPORTION?"

SIR,—It is essential in discussions of this kind that the words used should have a precise value, a definite meaning. When it is said that a work is proportioned, it is meant that it is well "proportioned"; but the word "proportioned," connoted with the prefix badly, is also applied to the unsymmetrical both in nature and in art. "Symmetrical" is probably the word which ought to be used for the æsthetically or beautifully proportioned; this word, however, is unfortunately generally misapplied, in discussions on architectural matters, to balanced repetition on either side of a medial line, as observed in the features of the human figure, and to regularity in geometrical configuration. Everything in existence is either well proportioned or ill proportioned, *i.e.*, exists in either right or wrong quantitative relation. It is idle, therefore, for any one to talk or write upon the subject of proportion who has not conceived it mathematically.

Before the subject of proportion can be firmly grasped, we must be able to clearly discriminate between æsthetic proportion and proportion in relation to constructive fitness. The science of æsthetic proportion treats only of those proportions which, quite irrespective of any other purpose, are opposite to taste. The adaptation of proportion to taste is a distinct section of study, which may be pursued abstractly and independently of any consideration touching the conformity of proportion to any other end. In fact, the adaptation of proportion to constructive purposes is ruled by quite other considerations, by the necessities of the case, and cannot be formulated as a science. Æsthetic proportion, however, is founded on human experience as to what proportions, in the combinations of forms, colours, and musical notes, are apposite to taste, to the senses of sight and of hearing; and not upon any vague *à priori* notion that some ratio $a : b$ is a beautiful ratio. Half-educated persons in these matters would appear to think that to call proportions either mathematical or geometrical must necessarily determine them to be beautiful; why, every quantitative relation, every proportion, good, bad, or indifferent, is mathematical, and every configuration of surface, and every form of solidity, is geometrical. In the course of my studies connected with the subject of proportion in general, I have formulated the science of æsthetic proportion, and have demonstrated that the music of form, colour, and sound are based upon identical quantitative relations; that the same ratios which are apposite to the ear are also apposite to the eye. I have shown, moreover, that there is a corresponding effect produced by the same combinations of ratios on the auditory and optical senses,—possibly on all the senses.

Proportion in the concrete, or in reference to constructive fitness, is quite another consideration. Neither on *à priori* nor on æsthetic grounds could the proportions of either a column or a doorway be determined. The proportions of these may be decided by reference to some constructive end; by the Greeks it was probably determined by reference to human proportions, for the column of 8 : 1, with interval of 4 : 1, conforms to the general proportions of typal human form, sideways and full front. The interval of 4 : 1 is, therefore, a consistent ratio for an intercolumniation, for an entrance, a doorway. There is a tradition, indeed, that the variations in the proportions of the column and its interval, in Greek architecture, were decided by reference to certain characteristic human proportions. The proportions of either a factory chimney or of a steam-engine are not determined by any æsthetic considerations, but by constructive necessities; and this is why constructive fitness of proportion is not necessarily beautiful; rigorous constructive fitness of proportion commends itself to the judgment rather than to taste. But the proportions which are adapted to a constructive purpose may sometimes coincide with proportions which are apposite to sense, to taste; as, for instance, those of the perfect human form, the egg-shape, &c. Although we all know perfectly well that the horse, the gazelle, the leopard, the hippopotamus, the elephant, and the toad, are all equally admirably proportioned to their several ends, no one would be able to convince us that their forms are all equally agreeable and apposite to the sense of sight. Sensitive æsthetes will often insist that the ugliness of constructive fitness should be garnished by something beautiful, *appliqué*, which appears to me about as reasonable as it would be to insist that the hippopotamus should be made pretty.

There can be no doubt that the general effect which a building or a chamber makes upon us may to some extent be dated from ourselves, from the relative magnitude of the observer to the building, just as we are differently affected by the magnitudes of hill and mountain, the different scale of natural scenery, in comparison with our own dimensions.

W. CAVE THOMAS.

STAINED GLASS.

Debden.—The east window in the chancel of the parish church at Debden, near Saffron Walden, has just been filled with stained glass. It is a three-light window, and has "The Crucifixion" forming one subject, running through the three openings, the background being a deep ruby, panelled upon a foliated ground of roses and carefully-drawn foliage. The tracery of the window is filled with weeping angels, and the bases of the lights with appropriate symbols of the pelican feeding its young, and the Alpha and Omega. The window is the gift of Mr. R. S. N. Barthropp, to the Vicar, and is the work of Messrs. Gibbs & Howard, of London.

Handborough.—An improvement has just been effected in the church at Handborough, by the filling of the three-light east and west windows with Munich stained glass, by Mayer & Co. The former represents the angel appearing to the women at the sepulchre, and the latter contains rich and chaste ornamental designs. The whole has been erected in memory of the wife of the Rev. R. P. Newhouse.

Miscellanea.

Railway Plant for Victoria.—It is stated that the Government of Victoria, Australia, have just placed a further order for 30,000 tons steel rails and fish-plates. Competition was very severe between English and Continental manufacturers, but the *Ironmonger* states the order was secured for Belgium through De Paula & Co., London. The foreign houses were able to compete on close terms for the extended deliveries specified in this instance.

Maidstone Local Board.—Mr. Anscomb, C.E., who has held the appointment of Borough Surveyor of Maidstone for upwards of eight years, has resigned the appointment in favour of private practice.

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The Latest Excavations at Pompeii.—The Naples correspondent of the *Daily News* writes:—"The last house excavated at Pompeii in Isola V., Regione VIII., is of an anomalous kind. It is situated at the south side of the isola. Its construction is quite unusual, as it possesses no proper atrium. On entering the doorway you find on your right a small stove in the corner of the passage, and on the left is the kitchen proper, with a room for slaves. Then to the right is a row of columns, forming a rectangular space, in the midst of which is the triclinium, with the reclining bed formed of masonry, and in the centre a cylindrical table covered with slabs of marble geometrically arranged. The wall-paintings of this open space are not of great value: there are heads of Medusa, hypographs, and fantastic birds. Returning into the passage, there is on the left next to the kitchen an exedra, with walls ornamented with white and yellow squares, divided by columns, decorations, and festoons, all in fresco. At the entrance of this room are two strange figures; on the left, an infant surprised at the sight of a large rat issuing from a trap, and on the right the same infant trying to catch the rat. On the left wall is a medallion with a small figure, two Cupids and two flying geniuses, one with a pastoral staff in the left hand, and a bunch of grapes in the right; the other with a staff in the right hand, and the left supporting a basket on the shoulder. The opposite wall is in a bad condition, so that nothing can be distinguished but the faint traces of a similar medallion. This room was covered, and above it and the kitchen was a second story, to which access was had by a staircase at the end of the ground-floor passage, and by a similar passage above. Behind the exedra (always to the left of the passage) comes an enclosed garden. A window into this garden gave light to the staircase. At the extreme end to the right is another small room, with a window opening into the triclinium. This room had another above it, and the sole connexion between this upper room with the others on the left was by means of the passage on the second floor. Many vases, shells in bronze, several gold rings with engraved stones, and amphoræ, were found in this house, and six skeletons. A walled-up door on the left wall of the exedra makes it probable that the house was once a portion of some other larger dwelling, and that it, like so many others, had been sold separately, and undergone various changes."

The Drainage of Cannes.—M. Gazagnaire, the mayor of Cannes, sends to the *Morning Post* some information as to the sanitary works now being carried out in that town:—He says the contract for one portion was taken on the 17th of August, and the works were begun on the 21st. This portion consists of, first, the sewer of the Boulevard de la Croisette from the Rue d'Oustinoff to a large receiving sewer which already exists; and, secondly, the portion of the Rue d'Antibes from the passage on the level to the Boulevard de la Croisette, running by the Rue d'Oustinoff and the Rue Duboys d'Angers. The system of sewers will need three contracts for its entire completion. According to the scheme, the flow from the sewers will be conducted to a point, say the mole of the port, where an elevating-machine will raise and empty them into the Gulf of Napoule, near the opening of the Canal de la Siagne at the Trou de l'Ancre, where the depth is from eight to ten fathoms, and there are currents which will carry everything away into the open sea. The authorities are also engaged in elaborating a plan for the complete drainage of the low-lying grounds. This will be commenced with Chataignier.

An Appointment at Swansea.—A correspondent writes to say that in our issue of August 5th there appeared an advertisement for an Estate Superintendent under the Swansea Town Council. The advertisement stated that applications were to be sent in "not later than the 7th prox." On the 6th inst., our correspondent sent in an application, together with testimonials, and by return of post had them returned, accompanied by a letter from the Town Clerk (dated Swansea, September 7th), stating that the application came too late, as "the selection had been made"; and further stating that "the appointment would be made early in the following week." Some further explanation appears to be needed.

Another Theatre Burnt Down.—The Beriot Theatre at Louvain was destroyed by fire on the 11th inst. No lives were lost.

The Value of Sunshine has been strikingly exemplified since the 4th of August, when it may be said the summer commenced. It has arrested the progress of potato disease, rendered the harvesting of grain possible, and made a fair finish of the hay crop in the late districts. Still more strikingly has the influence of solar light on vegetation been displayed in the flower garden, for with the brighter days there came a perfect flood of flowers; and yet the sunny days have been divided by chilly nights, and the thermometer has on several occasions very nearly touched the freezing point. But tender plants seem able to endure without harm a temperature lower than we should dare to subject them to by intention, provided they are well-established in the ground, and are brought to their full development in a dry healthy air under continuous sunshine. We cannot make sunshine, but we may, and must, take note of its action with a view to accommodate all our out-door work to the necessity that is so amply demonstrated. When we plant strawberries on terraces, and potatoes on ridges, and stone fruits on walls, we are complying with the direct teachings of nature in respect to the powers of solar light, and it may be that we have much yet to learn as to the utmost advantageous appropriation of a power that we can never influence directly, and to only a small extent indirectly. As regards the possibility of indirect influence, we have but to compare the country with the town. In the country the light is strong and pure, and vegetation rejoices in it; in the town it is weak and impure, because we have ourselves loaded the air with smoke and dust, and the adulterated sunshine produces a weaker plant and a weaker man than that of the open country, where there are no fumes from chimneys, and no unwholesome exhalations from sewers and rubbish heaps, which are equally obstructive of sunlight and poisonous to all forms of animal and vegetable life.—*Gardener's Magazine.*

Fire at a Builder's.—Between ten and eleven o'clock on Sunday morning a fire broke out on the premises of Messrs. Ashby Brothers, builders, No. 24, Bishopsgate-street. The property is approached by a gateway next to the fire-brigade station, and runs some distance back, abutting on the rear of the houses in Devonshire-square. The firemen were the first to discover the fire burning in one of the upper workshops, and the hose was instantly brought out of the station and attached to a street hydrant, whence a good supply of water was obtainable; but the flames developed themselves rapidly. Other engines were brought to the scene. The superintendent's report represents the damage occasioned as follows:—"A brick and timber building, of three floors, about 45 ft. by 30 ft. (used as workshops and stores), second floor and contents burned out, and roof off; rest of building and contents and stock in open yard severely damaged by fire and water." We understand that Messrs. Ashby Bros. have also premises in the Kingsland-road, which will enable them to carry on their business with less difficulty than they would otherwise experience.

Beneficial Results of Sanitary Measures — On the 7th inst. the eighth annual meeting of the Sanitary Association of Scotland took place in Greenock. Mr. Mackay, Sanitary Inspector, gave an interesting sketch of sanitary progress in Greenock. He said that when, in 1876, the local authorities got Parliamentary powers for carrying out a scheme of town improvement in many closes in the lower part of the town, the mortality averaged from 40 to 57 per 1,000, while the general mortality was higher than in any other town in Scotland. Between 1855 and 1875, the mean death-rate was 30·24; while for the five years ending 1880, since stringent regulations had been adopted, it was 24 per 1,000.

The De Lank Granite Quarries, now called the Eddystone Granite Quarries, are in full work again, the proprietor, Mr. Shearer, having secured from the Trinity House contracts for the supply of granite for the Bishop's Rock Lighthouse, and from the Admiralty for a dock at Haulbowline, in addition to other large works in hand. The fact that these quarries supplied the stone for the new Eddystone Tower in six months less than the contract time testifies to their capabilities.

Chard Parish Church.—The restoration of the parish church of Chard, in Somerset, at an estimated cost of 5,000*l.*, has been commenced.

"The Wall that Jack Built."—The correspondent of the *Standard* at Alexandria gives the following account of the cutting which is being made through the sand-hills between the sea and Lake Mareotis:—It is intended to raise the level of the lake and so flood a wide tract of sand, now dry, so as to form a protection to our right flank. A large body of natives were at work deepening the moat under the western walls of the fort, while at each end working parties of blue jackets from the *Inconstant*, under Lieutenant Scott, were engaged in blasting the dams. In three days the indefatigable sailors have built up a wall 4 ft. high, 12 ft broad, and nearly 200 yards long, to prevent the inflowing water from wasting itself in the western section of the lake beyond the disused railway embankment, which has also been pierced to allow the passage of the water into the eastern section. The work is now nearly complete, and this morning the tars erected a triumphant placard, "H.M.S. *Inconstant*. This is the wall that Jack built."

Burnley.—On the 2nd inst., the memorial-stones of a school-chapel, to be erected in Hufting-lane, Burnley, for the Wesleyan denomination, were laid by the mayor (Alderman Fielding), the ex-mayor (Alderman Howorth), Mr. John Butterworth, J.P., and Miss Butterworth. The building will consist of a large room, to seat about 300 persons, and four class-rooms, and is estimated to cost about 1,500*l.*, towards which sum 1,000*l.* has already been raised. It is the design of, and will be completed under the supervision of, Messrs. Waddington & Sons, architects, Burnley. Land has been taken for the erection of a chapel adjoining the proposed building, to be erected when required.

New Assembly Rooms, adjoining the King's Arms Hotel, Wood-green, were opened last week, and a want long felt in the neighbourhood has been supplied by Mr. Greenslade. The room itself, 73 ft. long by 35 ft. wide and 19 ft. high, will seat comfortably 750 persons, and has cloak and retiring rooms attached. The approach is by a wide stone staircase, and the rooms are lighted by sun-burners, special attention having been given to the ventilation. Mr. Henry Stone is the architect, Mr. John Bell the contractor, whilst Mr. Cawdron acted as clerk of works.

New Workhouse Schools, Oldham.—The premiums in this competition have been thus awarded by the Guardians:—First (50*l.*), Mr. Thomas Mitchell (motto, "Charity"); second (30*l.*), Messrs. Wild & Collinge ("Oliver Twist"); third (20*l.*), Mr. Alexander Banks ("A.R.A."). All the competitors are Oldham practitioners. The other competitors received a vote of thanks as a "consolation prize."

Darlington.—New printing and publishing offices are about to be erected in Crown and Quebec streets, Darlington, for the Northern Counties Constitutional Newspaper Company (Limited), from the designs of Mr. G. G. Hoskins, architect, of that town.

TENDERS

For the erection of five houses at Lavender-hill, for Mr. Sydney J. Stern. Mr. B. T. L. Thomson, architect. Quantities supplied:—

	Specification No. 1.	Specification No. 2.
Bowes	£6,348	£5,659
Harverson	6,106	5,546
Ellis	5,863	5,159
Laing & Son	5,790	5,266
Lathey Bros.	5,582	4,964
Turtle & Appleton	5,475	4,880
Johnson	5,364	4,869
Holloway Bros.	5,243	4,724
G. Ugle	4,994	4,420

For the erection of a new Railway Hotel, at Newbury, Berks, for Mr. E. H. Morland. Messrs. Winship & Harrison, architects, Abingdon, Berks. Quantities supplied:—

H. Potter & Sons	£995	0	0
Harrison	961	9	0
Deacon	878	8	4
Hedge	807	6	2
Williams (accepted)	772	0	0

For pulling down and rebuilding the Bedford Arms public-house, Dawes-road, Fulham, for Mr. T. P. Davis, Walham-green. Mr. William Bradford, Carlton-chambers, Regent-street, architect. Quantities by Messrs. J. & A. E. Bull, 35, Craven-street, Strand:—

T. H. Adamson & Son, Putney	£2,225	0	0
Higgs & Hill, South Lambeth	2,190	0	0
J. McLachlan & Sons, Clapham	2,134	0	0
G. H. & A. Bywaters, Regent-street	1,985	0	0
W. H. Smith, Walham-green	1,900	0	0
Patman & Fotheringham, Theobald's-road	1,893	0	0

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For the erection of Board Schools to accommodate 850 children, at Blaina, Mon., for the Aberystwith School Board. Mr. W. D. Blessley, architect, 22, Trinity-street, Cardiff:—

School Building.

S. Shepton	£6,210	0	0
J. Clarke	5,493	0	0
Thomas Watkins & Jenkins	5,400	0	0
H. Welsh	5,400	0	0
H. Parfitt	5,400	0	0
W. McGaul	5,265	0	0
D. Davies	4,990	0	0
Coleman Bros.	4,920	0	0
Jones & Son	4,773	0	0
Bowers & Co.	4,770	0	0
Thos. White	4,550	0	0
J. Jenkins, Brynmaur (accepted)	4,450	0	0
H. C. Forse	4,193	0	0

Preparing Site, Boundary Walls, &c.

H. Parfitt	£1,370	0	0 !
H. Welsh	1,280	0	0
S. Shepton	1,273	0	0
Thomas Watkins & Jenkins	1,220	0	0
D. Davies	1,210	0	0
W. McGaul	1,139	0	0
Coleman Bros.	1,110	0	0
Bowers & Co.	1,100	0	0
Jones & Son	1,045	0	0
Thos. White	1,000	0	0
H. G. Forse	950	0	0
J. Clarke	900	0	0
J. Jenkins, Brynmaur (accepted)	600	0	0 !

Strengthening Walls with Hoop Iron and White's Patent Compo.

S. Shepton	£452	15	0 !
Thomas Watkins & Jenkins	400	0	0
H. G. Forse	287	0	0
H. Welsh	280	0	0
Bowers & Co.	280	0	0
J. Clarke	249	0	0
Thos. White	249	0	0
W. McGaull	247	17	7
H. Parfitt	240	0	0
D. Davies	240	0	0
Jones & Son	239	0	0
Coleman Bros.	225	0	0
J. Jenkins, Brynmaur (accepted)	108	0	0 !

Board Room, &c.

H. Welsh	£874	0	0
S. Shepton	805	0	0
W. McGaul	800	0	0
H. Parfitt	790	0	0
D. Davies	790	0	0
Thos. White	780	0	0
H. G. Forse	780	0	0
Bowers & Co.	750	0	0
Thomas Watkins & Jenkins	750	0	0
Jones & Son	740	0	0
Coleman Bros.	740	0	0
J. Clarke	582	0	0
J. Jenkins, Brynmaur (accepted)	456	0	0

For new counter and fittings at the King's Head, Ebury Bridge, Pimlico, for Mr. J. Ditton. Mr. Charles Jones, architect, 151, Ebury-street:—

Buckley & Beach	£162	0	0
Louth	138	0	0
Helling	136	0	0
Rogers	135	0	0
Watts	124	7	0
Sanders & Sons	117	0	0

New Lobbies.
Taylor, Camberwell (accepted).

For alterations and repairs at the Royal Arms, Battersea Park-road, for Mr. Thomas J. Hardy. Mr. Charles Jones, architect:—

Lathey Bros.	£205	0	0
Street	198	0	0
Ashfold	196	0	0
Coulthard	189	8	0
Heath	177	0	0
Walkley	167	0	0
R. & H. Pickersgill	152	0	0

For additions and alterations at 119, Ebury-street, Pimlico, for Mr. W. Piggott. Mr. Charles Jones, architect:—

Holt & Garlick	£285	0	0
Heath	249	0	0
G. & W. Watson	244	18	0
Coulthard	240	0	0

For extension of factory, Millwall, for Mr. J. T. Morton. Under the superintendence of Mr. William Eve, 16, Union-court, Old Broad-street:—

Chafen	£2,040	0	0
Shurmur	1,790	0	0
Salt	1,743	0	0
Crabb	1,700	0	0
Harris & Wardrop,* Limehouse	1,569	0	0

* Accepted.

For warming and ventilating, by their new hydro-caloric apparatus, the second section of one wing of Greenwich Hospital Schools:—

J. Weeks & Co., Chelsea	£360	0	0

For the construction of about 1,280 ft. lineal of 9-in. stoneware pipe sewers, with manholes, lampholes, &c., in Addison-road and Cowper-road, for the Bromley Local Board. Mr. Hugh S. Cregeen, surveyor:—

James Taylor	£195	15	6
Davis & Attwood	163	10	0
Thomas Lansbury	167	0	0
R. Peill & Sons	154	10	0
John Bentley (accepted)	149	0	0

For the erection of a residence, Wetherby-road, South Kensington, for Captain W. Abney, R.E. Mr. William H. Collbran, architect, 94, Gloucester-road, South Kensington. Quantities by Messrs. Strudwick & Mennie:—

G. H. & A. Bywaters	£3,300	0	0
Higgs & Hill	3,180	0	0
A. Thorn	3,150	0	0
J. McLachlan & Sons	3,140	0	0
H. Smith	2,989	0	0
Martin, Wells, & Co.	2,900	0	0
Perry & Co.	2,830	0	0
H. Toten & Sons	2,825	0	0
Ashby Bros.	2,718	0	0
B. E. Nightingale	2,597	0	0

For the erection of ten cottages, at Broad River, Orpington, Kent. Mr. St. Pierre Harris, architect:—

Waite, Dartford	£1,800	0	0
Epsom, St. Mary Cray	1,800	0	0
A. & F. Smith, Greenwich	1,800	0	0
Marsh	1,500	0	0
Laslett, St. Paul's Cray	1,480	0	0
Lay, Bromley	1,450	0	0
Wright, Chelsfield (accepted)	1,450	0	0

For additions and alterations to residence, High-street Orpington, Kent. Mr. St. Pierre Harris, architect:—

Wood, Chislehurst	£247	0	0
Haisman, Foot's Cray	225	0	0
Treadwell (too late)	215	0	0
Taylor & Son, Bromley (accepted)	190	0	0

For additions and repairs to The Hawthorns, Bromley, Kent. Mr. St. Pierre Harris, architect:—

Payne	£275	0	0
Arnaud	253	0	0
Balding	234	0	0
Crossley (accepted)	229	10	0

For building a detached villa-residence, Anlaby-road, Hull, for Mr. Henry Allison. Mr. Robert Clamp, architect. Quantities supplied:—

G. Jackson & Son, Hull	£4,200	0	0
Habbershaw & Son, Hull	3,650	0	0
T. Goates, Hull	3,481	16	11
Sergeant, Hull	3,435	0	0
Alfred Brown, Hull	3,433	9	4
Siminson, Hull	3,351	10	5
J. & W. Stamp,* Barton-upon-Humber	3,190	7	0

* Accepted, subject to modifications.

For alterations and repairs to 21, Hertford-street, Mayfair, for Sir John Whittaker Ellis, bart. Under the superintendence of Messrs. Farebrother, Ellis, Clark, & Co. No quantities:—

Patman & Fotheringham	£1,593	0	0
J. & P. Hermon	1,397	0	0
A. G. Bolding	1,357	0	0
Burningham & Co.	1,229	0	0
Geo. Shaw	1,131	0	0

For alterations and additions to 93, Jermyn-street, St. James's, for Mrs. Welch. Mr. J. Wm. Stevens, architect. Quantities not supplied:—

Styles & Sons	£700	0	0
Holliday & Greenwood	677	0	0
Axford	558	0	0
A. G. Bolding	557	0	0
Scott	487	0	0

For alterations and additions to Nos. 26 and 27, Somerset-street, Portman-square. Messrs. J. & J. Belcher, architects. Quantities by Mr. J. E. Drower:—

Robt. Perkins	£1,157	0	0
F. W. E. Braid	988	0	0
Langmead & Way	981	0	0
W. Scrivener & Co.	981	0	0
A. G. Bolding	949	0	0
J. Holloway	925	0	0

For Branch Bank, Hereford, for the Worcester City and County Banking Company. Mr. E. H. Lingen Barker, architect:—

Taylor	£1,240	0	0
Cullis	1,200	0	0
Balcombe	1,195	0	0
Kendrick	1,191	0	0
Jones	1,112	0	0
Wood & Sons	1,097	0	0
Collins, Tewkesbury (accepted)	1,020	0	0

For assembly-room and additions, Red Lion Hotel, Colchester, for Mr. William Wilberforce Daniels. Mr. Frederick Evelyn Morris, architect:—

C. H. Oldridge, Colchester (accepted)	£2,000	0	0

For villa residences at Epsom, for Mr. W. Reeve. Mr. J. R. Harding, architect, Epsom, Surrey:—

	One Villa.			Two Villas.		
Rivers	£1,220	0	0	£2,400	0	0
Green	1,173	0	0	2,330	0	0
Hards	1,144	0	0	2,280	0	0
Payne	1,086	0	0	2,120	0	0
Potter	1,020	0	0	2,000	0	0
Keal (accepted)	950	0	0	1,850	0	0

For repairs at the Licensed Victuallers' Asylum, Old Kent-road. Mr. W. F. Potter, architect:—

L. E. Clark, Kennington (withdrawn)	£475	0	0 !
W. H. Pritchard, Southwark	225	0	0
C. Dearing & Son, Islington	210	5	0
S. Hayworth, Kingsland	210	0	0
W. Wells, Paddington	190	0	0
W. Wythe, Dalston	164	10	0
F. Hersee, Peckham (accepted)	136	0	0 !

For the supply of 3-in. socket water-pipes, for the Guildford Urban Sanitary Authority:—

	Per Ton.		
Reading Iron Works	£5	13	6
Mason & Weyman	5	10	0
Carling, Gill, & Carling	5	10	0
Enfield Iron Company	5	10	0
Bailey, Pegg, & Co.	5	7	6
Goodyer	5	6	0
Currington	5	2	9
Thames Iron Company	5	1	3
Noble & Co.	4	19	6
J. & S. Roberts (accepted)	4	17	6

For the erection of shops and offices, St. Mary Axe, for Mr. Peyton Dashwood. Mr. A. Croft, architect:—

Aviss & Co.	£8,790	0	0
David King & Son	7,800	0	0
Killby	7,667	0	0
Perry & Co.	7,529	0	0
Higgs & Hill	7,500	0	0
Shurmur	7,389	0	0

For alterations, 42, Cannon-street, for Messrs. Sterne & Co. Mr. John Whichcord, architect:—

David King & Son	£1,578	0	0
E. Lawrence	1,267	0	0

For building three residences at Dulwich, for Mr. Burton. Mr. Barker, architect:—
Joseph Higgs, Upper Park-place (accepted).

For the erection and completion of sheds for lairage, accommodation slaughter-houses, tripe houses, roads, &c., at the Foreign Cattle Market, Deptford, for the Worshipful the Cattle Markets Sub-Committee of the Hon. the Corporation of the City of London. Mr. Horace Jones, architect. Quantities by Nixon & Raven:—

Lovett	£36,289	0	0
Kirk & Parry	34,290	0	0
Kellett & Bentley	34,085	0	0
Chappell	33,634	0	0
Nightingale	32,983	0	0
Shaw	32,252	0	0
J. & T. Greenwood (too late)	31,000	0	0
Mowlem	29,877	0	0
Morter	29,129	0	0
Gentry	26,825	0	0

For enlarging the following schools for the West Ham School Board. Mr. J. T. Newman, architect. Quantities by Messrs. R. L. Curtis & Sons:—

Clarkson-street:—

Thurston	£5,640	0	0 !
Russell	2,904	0	0
Taylor & Grist	2,490	0	0
Higgs	2,390	0	0
Jones & Co.	2,330	0	0
Nightingale	2,259	0	0
Reed	2,210	0	0
Swain	2,205	0	0
Lolargan	2,200	0	0
Hearle & Son	2,174	0	0
Gregar	2,167	0	0
Cox	2,130	0	0
North Bros.	2,125	0	0
Morter	2,087	0	0
Gentry (accepted)	2,000	0	0 !

Maryland Point:—

Miller	£3,800	0	0
Higgs	3,480	0	0
Taylor & Grist	3,380	0	0
Lolargan Bros.	3,148	0	0
Russell	3,134	0	0
Swain	3,121	0	0
Jones & Co.	3,090	0	0
Nightingale	3,070	0	0
Reed	3,015	0	0
Gregar	2,979	0	0
Hearle & Son	2,972	0	0
Morter (accepted)	2,970	0	0
North Bros.	2,890	0	0
Cox	2,830	0	0
Gentry	2,750	0	0

North-street:—

Taylor & Grist	£3,120	0	0
Russell	2,899	0	0
Lolargan	2,840	0	0
Higgs	2,800	0	0
Jones & Co.	2,680	0	0
Nightingale	2,649	0	0
Swain	2,594	0	0
Morter	2,500	0	0
Gregar	2,490	0	0
Hearle	2,483	0	0
Reed	2,469	0	0
North Bros.	2,450	0	0
Cox (accepted)	2,400	0	0
Gentry	2,385	0	0

For sewerage of Tremadoc and Borth, for the Ynyscynhaiarn Local Board. Mr. Thomas Roberts, C.E.:—

Davies & Jones, Festiniog	£2,313	9	11
Hughes, Portmadoc	1,837	0	0
Owen, Portmadoc	1,800	0	0
Davies, Portmadoc (accepted)	1,762	2	0

For alterations and additions to farm house, Alconbury Weston, Hunts. Mr. Robt. Hutchinson, architect:—

Thackray & Son	£379	0	0
Whiteman	348	0	0
Childs & Gale	322	0	0
Lord	320	0	0
Howard	309	0	0
Murphy	298	0	0
W. Rowe (accepted)	280	0	0

For the erection of farm buildings, at The Hyde, Hendon. Mr. Robt. Hutchinson, architect:—

Kirby	£1,313	0	0
Donne	1,275	0	0
Lord	1,265	0	0
Thackray & Son	1,165	0	0
Wade & Edey	1,150	0	0
Francis	1,127	0	0
Saint & Son	1,100	0	0
Bunting	1,095	0	0

For the erection of farm buildings on the Slade Farm, Cricklewood. Mr. Robt. Hutchinson, architect:—

Kirby	£324	0	0
Lord	315	0	0
Wade & Edey	315	0	0
Thackray & Son	310	0	0
Donne	300	0	0
Francis	290	0	0
Saint & Son	280	0	0
Bunting	273	0	0

For alterations and additions to Eldon House, Streatham. Mr. R. Cruwys, architect, Bank-chambers, 451, Brixton-road. Quantities by Messrs. Franklin & Andrews:—

J. & C. Bowyer	£1,649	0	0
Maxwell Bros.	1,394	0	0
D. S. Rice	1,392	0	0
W. Downs	1,377	0	0
J. Smith & Sons	1,347	0	0
J. Taylor	1,247	0	0
G. Candler	1,210	0	0
J. Tyerman	1208	0	0
W. Mason	1,193	0	0
J. Macey & Sons	1,169	0	0
Pack Bros., Brixton (accepted)	1,157	0	0

For alterations to Eldon Lodge, Streatham. Mr. R. Cruwys, architect:—
Mason, Streatham (accepted).

For the erection of a detached house, West Buckland. Mr. R. Cruwys, architect:—
Buckingham (accepted).

Fitzgerald Estate.—Mr. Round's tender was 1,087*l.*, instead of 1,187*l.*, as we were informed.

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For new roads, sewers, and surface-water drains, for the British Land Company, Limited, on their estate at Wimbledon. Mr. Henry B. Michell, surveyor:—

Crockett, St. Pancras	£1,795	0	0
Killingback, Camden Town	1,789	0	0
McKenzie & Williams, London	1,733	0	0
Nowell & Robson, Kensington	1,712	0	0
Keeble, Regent's Park	1,700	0	0
Catley, Lloyd-square	1,550	0	0
Harris, Camberwell	1,527	0	0
Wilson, Walthamstow	1,444	0	0
Pizzey, Hornsey	1,422	0	0
Dunmore, Hornsey	1,363	0	0
Bloomfield, Tottenham	1,339	0	0
Jackson, Leyton	1,333	0	0
Peill & Sons,* Bromley, Kent	1,320	0	0

* Accepted.

For pipe-sewer and storm-water culvert, for the British Land Company, Limited, on their estate at Hornsey. Mr. Henry B. Michell, surveyor:—

Nowell & Robson, Kensington	£1,445	0	0
Catley, Lloyd-square	1,280	0	0
McKenzie & Williams, London	1,231	0	0
Pizzey, Hornsey	1,222	0	0
Crockett, St. Pancras	1,205	0	0
Killingback, Camden Town	1,148	0	0
Jackson, Leyton	1,111	0	0
Keeble, Regent's Park	1,100	0	0
Harris, Camberwell	1,050	0	0
Dunmore, Hornsey	1,049	0	0
Bloomfield, Tottenham	999	0	0
Wilson, Walthamstow	999	0	0
Peill & Sons,* Bromley, Kent	876	0	0

* Accepted.

For the erection and completion of a new Wesleyan Chapel, New Sueinton. Mr. Arthur Marshall, architect, Nottingham:—

Contract No. 2.

D. E. Lynam	£2,735	0	0
H. Vickers	2,675	0	0
F. Messom	2,350	0	0
Wooll Bros.	2,346	0	0
A. B. Clarke	2,346	0	0
E. Hind	2,298	0	0
Bell & Son	2,218	0	0
J. Jelley	2,207	0	0
Dudson & Parrish	2,125	0	0
G. Hewitt (accepted)	2,040	0	0

For additions and alterations to the Patriotic School for Boys, Wandsworth, for the Governor of the Westminster Emanuel Boys' School. Mr. H. Dawson, architect. Quantities by Mr. C. N. McIntyre North:—

Adamson & Son	£2,390	0	0
Smith & Son	2,112	0	0
G. Woodward	1,960	0	0
J. McLachlan & Sons	1,920	0	0

For cast-iron and earthenware pipe sewers, and other works, at Sutton Coldfield Sewerage Works. Mr. E. Pritchard, engineer, 27, Great George-street, Westminster. Quantities by Mr. E. J. Purnell, Coventry:—

Macrea & Macfarland, Dublin	£24,090	0	0!
J. Bush, Ulverstone	16,569	10	10
W. R. Green, Ilfracombe	16,350	0	0
Baker & Sons, Barlborough	16,267	4	7
J. Garlick, Saltley	14,916	0	0
Fotherby & Son, Burnley	14,656	15	7
Dovener & Son, Sowerby Bridge	14,540	0	0
Jos. Evans, Aston	14,180	0	0
D. Shanks, Kirkcaldy	13,850	0	0
Jno. Fell, Leamington	12,750	0	0
Geo. Law, Kidderminster*	11,777	0	0
A. Palmer, Birmingham	11,685	0	0!

* Accepted.

House Connexions and Private Drainage Works.
George Law (accepted).

For making roads and paths, building caretaker's house, boundary-wall, fences, &c., in the Havelock-road, Southall, for the Burial Board for the Parish of Norwood, Middlesex. Mr. Thos. Newell, architect, Dashwood House, New Broad-street. Quantities by Mr. Sidney Young:—

Woodham & Co., Catford	£1,274	0	0
H. R. Swain, London	1,085	0	0
W. Crockett, London	1,063	0	0
W. Brown, Southall	1,035	0	0
H. S. Pollard, London	993	0	0
F. Taylor, Uxbridge	969	0	0
T. Hiscock, Hounslow	950	0	0
C. Kearley, Uxbridge	925	0	0
P. Bell, Southall	890	0	0
French & Medcraft,* Hanwell	757	10	0

* Accepted.

For the erection of greenhouses, Aigburth Drier, Sefton Park, Liverpool, for Mr. E. L. Wigan. Mr. Walter W. Thomas, architect, 25, Lord-street, Liverpool:—

T. Urmson	£320	0	0
Heating with Hot Water.			
F. & J. Mee	117	9	0

For alterations to hospitals, Smithdown-road Workhouse, Liverpool, for the Toxteth Board of Guardians. Mr. Walter W. Thomas, architect:—

Jno. Titterington	£371	11	0
Heating the Sick Wards with Hot Water.			
Geo. Kneale	193	10	0
Reconstruction of Drainage.			
George Hall	377	0	0

For alterations to the public offices, 15, High Park-street, Liverpool, for the Toxteth Board of Guardians. Mr. Walter W. Thomas, architect:—

Jno. Titterington	£282	14	0
Extension of Heating.			
R. Renton Gibbs	68	0	0

For alteration of premises, 58 and 60, Lime-street, Liverpool, for Messrs. Hyam & Son. Mr. Walter W. Thomas, architect:—

Brown & Backhouse	£2,775	0	0
Fitting up Shop.			
Brown & Backhouse	347	14	0

For the erection of stables, in Brancker-street, Liverpool, for Mr. James Pratt. Mr. Walter W. Thomas, architect:—

Nicholson & Ayre	£339	0	0

For the erection of new shop, in Stafford-street, London-road, Liverpool, for Mr. Owen Owen. Mr. Walter W. Thomas, architect:—

Thos. Ray (carpenter & joiner)	£3,658	0	0
J. Henshaw (bricklayer)	1,971	0	0
Homan & Rodgers (smith and iron-founder)	1,482	0	0
J. & J. Sanders (mason)	1,395	0	0
Thos. Lea (plumber, painter, and glazier)	1,069	0	0
W. Callaghan & Son (slater and plasterer)	500	0	0

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Box Ground, Combe Down,
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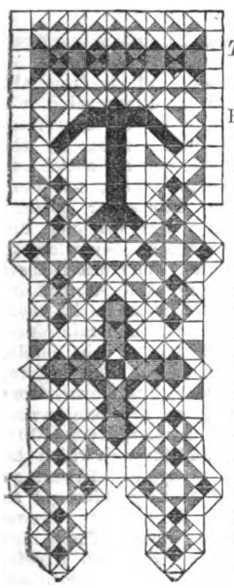

Compressed Air as a Transmitter of Motion.

THE account which was given to the Mechanical Section of the British Association of the working of a tram-car by compressed air at Nantes attracted so much attention, that it may be well to give a caution as to an important condition of the use of compressed air as a motor power, which does not appear to have engaged the consideration of the section. Of course it is known to all who touch the subject that it is incorrect to speak of compressed air as a motor power in the true sense of the term. It is, more correctly, a transmitter of power. To condense a certain volume of air, as in the present case, to a density of thirty atmospheres beyond the ordinary pressure,—that is to say, to a resistance of 450 lb. per square inch,—a force of that amount, plus friction and loss in delivery, must first be exerted. It is quite possible that circumstances may render this a desirable mode of, so to speak, bottling up force. But the worst of it is that, in the process, the force escapes from the bottle. It is not possible so to imprison and to condense a given volume of air as to allow of its yielding the same amount of force by its expansion that was exerted in its condensation. We speak not from scientific data alone, but from discussion of the practical experience gained by two of the first men in the profession of the civil engineer who, now some thirty-six years ago, spent much time, and unfortunately lost much money, in acquiring a dear-bought experience. These men were Isambard Kingdom Brunel and Eugène Flachat. The thief that ran away with the power was one who was unsuspected, but as to whose action, when once detected, no manner of doubt is possible. The name of the mischief-maker is Conduction. The reason why so many volumes of condensed air will not, as an elastic spring, give out the force exerted in compressing them is, that during compression, and to some extent after it, heat escapes from the compressed air. It escapes in a ratio proportionate to the amount of compression; that is to say, the more convenient and portable the form of the receiver or accumulator into which the charge is put, the higher the pressure obtained, the greater in proportion is the loss of heat in the process. The less will be the expansion, and the greater the capacity of the air, when expanded, for caloric. This fact lies at the very foundation of the ventilation of such works as the St. Gothard Tunnel by the use of perforators driven by compressed air. In the case of the South Devon Railway, after the line had been laid out with gradients suitable for stationary power, and powerful pumping machinery had been erected for the exhaustion of air from the pneumatic tubes, it was found necessary to abandon the scheme. The ports of the air-pumps became almost red hot, and the escape of caloric, not only in the pumps, but along the whole line of the pneumatic tube, was so great as to put a stop to a very elegant mode of traction, which had the great advantage of doing away with the weight of the locomotive.

The loss in a condenser such as that fit for a tramway or other locomotive engine is, of course, not so rapid as that in a long line of pipe. But the experience gained in the one case may be applied, *mutatis mutandis*, in the other. It is within the means of science to say how much heat,—that is to say, how much motive power,—may be lost in the process of filling a condenser of a given volume, at thirty atmospheres, or any other stated pressure, and how much will be the subsequent loss, by conduction, per hour. Before recommending the introduction of this convenient and elegant mode of transmitting power, the engineer is bound to calculate the cost,—the cost per unit of its own force,—of the loss by condensation.

The product of the pressure and the volume of atmospheric air, or of any gas, is proportionate to the absolute temperature. Thus, when the temperature is uniform, the product of the pressure and the volume of a given weight of gas is also uniform. If gas can be so compressed or expanded within a cylinder of non-conducting materials, the curve of expansion is called an adiabatic curve, and the general expression for the values is thus given:—

$$V P = 53{\cdot}15\ T$$

V being the volume of the gas, P the pressure in pounds per square foot, and T the absolute temperature of the gas, that is to say, the temperature in Fahrenheit degrees, *plus* 461°. This subject has been worked out with great, but, as it appears to us, very useless, accuracy. So utterly impossible is it for an adiabatic state, or a condition in which loss of heat by conduction is prevented, to exist in nature, that it seems something like laborious trifling to calculate by formulæ and equations what are the different phases of an impossible process. Where pressure is constant, the fraction of expansion for every degree of Fahrenheit by which temperature is raised is $\frac{1}{461}$. In the same way the abstraction of 1° Fahrenheit from the temperature, reduces the volume (under unchanged pressure) by $\frac{1}{461}$; or, if volume is constant, pressure is raised or lowered at the same rate, viz., by the $\frac{1}{461}$th part for every degree of Fahrenheit raised or lowered. Thus, in condensing air we have the two elements with which to deal of the quantity, that is to say, the weight, of the air forced into the condensers, and of the resisting power of heat lost or overcome in the process. Now, if we take the rule "to find the pressure of one pound of air, of a given temperature and volume," from the admirable "Manual of Rules, Tables, and Data for Mechanical Engineers," by Mr. D. K. Clark (a book that no student should be without), we find it to be, Divide the absolute temperature by the volume, and by 2·7074, the quotient is the pressure in pounds per square inch. But suppose we force 30 lb. of air into the space occupied by 1 lb. of atmospheric air under ordinary pressure, how much heat will escape in the process? We know of no reply to the question; and, in the absence of one, of what use is it to work out an equation in which temperature is an essential element? Supposing the thermometric heat of the atmosphere to be 62°, the absolute heat is 533°. But in the forcing into the same space of thirty times the volume of air, the temperature will be raised in the same proportion,—minus the escape of heat in the process. Each atmosphere of increased pressure is equivalent to an increase of 461°. Is it conceivable for a moment that thirty times 461°, that is to say, 13,830° Fahrenheit, has been attained? No material could resist such fierce heat. And the higher the temperature attained, the more rapid would be the loss of heat by conduction, radiation, or in whatever mode it would most readily escape to restore the equilibrium of nature. A pound of air, at the absolute temperature of 0°, that is to say, at −461° Fahrenheit, has, according to the formula, no elastic force. If so, 30 lb. at the same zero would have none. The expansive force of the 30 lb. is thus entirely due to the amount of heat contained within its volume; and from the commencement of the compression to the period at which equilibrium was established, there will be a constant flight and escape of heat, that is to say, of imprisoned energy, from the condensed air. Of course it is not to be supposed that a pressure of thirty atmospheres involves the condensation of thirty volumes, or, rather, weights, of air. But it is just because the resistance to compression depends, in part, on the weight of air, and, in part, on its temperature, that we regard the rules that are based on the adiabatic theory to be of so little practical use. There are no means known to us of either preventing or gauging the loss of caloric under compression.

Ingenuity of all kinds may be and has been directed to eluding the prime physical difficulty. It has been sought to heat the air as it expands. But this, though probably about the most economic and productive application of heat possible in the present state of science, is still the addition of power, and of cost. If the principle of Ericsson's caloric engine could be

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thoroughly applied,—if the heat escaping under compression could be stored up within the apparatus, and restored to the cool expanding air,—the loss might be obviated; but when we are speaking of high-pressure, which means high temperature, it is obvious that it is idle to talk of any such compensation.

It is somewhat remarkable that considerations of so elementary a nature were not brought forward in so congenial an atmosphere as that of the Mechanical Section of the British Association, where marvels and mountains were announced as to the use of compressed air as a motor power. Compressed air is not,—cannot be,—a motor power. And as an accumulator or transmitter of motive power, it is, we think, theoretically about the worst and most costly medium that can be desired. We bear all testimony to the extreme ingenuity that has been devoted to the study. We can recall instances where pressure and power are low, in which elegant and, no doubt, useful results have been obtained by the transmitter; as, for example, in the working of the gold weighing-machines in the Bank of England many years ago, one of the most delicate and magical of operations; but we are very much disposed to fear that the language applied by the *Manchester Guardian* to the discussions of the Economic Section of the British Association are not without some justice if applied to other discussions than that on Mr. Watherston's proposal to triple the national debt. "The section has in recent years lost caste by indulging in merely wordy discussions on merely wordy papers."

DRAINAGE IN FRANKFORT.

CIRCUMSTANCES led the writer of this paper to pass some months at Frankfort-on-the-Maine during the summers of 1881-82. He was much struck by the cleanly appearance of the town, as well as by the entire absence of all odours both inside and outside the houses. This led him to investigate the sanitary system of Frankfort, and as it simply acts perfectly, both as regards the healthiness of the population and the rapid removal of the drainage, he has thought well to publish an account of it. In some respects it differs from the system prevalent in England, reference to which will be made later on. The whole of the drainage works were carried out under the direction of the eminent firm of engineers Messrs. Lindley, from whose report much of the information now published is obtained.

In the year 1863 a commission was appointed by the municipality of Frankfort to decide upon a system of drainage suitable for the town. The commission, after a thorough investigation, decided upon a system of sewerage of which flushing was to be the leading feature. The town and suburbs were divided off by intercepting sewers into bands of land, and the course of these sewers was parallel to that of the river Maine from east to west. Following the contour of the land, two networks of drainage, independent one of the other, were undertaken, and called "the upper" and "the lower" system.

The upper network, as regards outlet, is independent of the water level of the river; for in time of floods it can be shut off from the lower network, and disposes of its drainage as will hereafter be stated. The lower network, on the contrary, is affected by the Maine, rendering it necessary in floods to lower artificially the water level.

The drains are so constructed as to carry off at once all house-water and water-closet discharges, as also the rain-water and land drainage water. At the same time, they are so arranged as to prevent sand, gravel, or anything of mineral origin getting into the sewers.

The construction of and slope given to the sewers are such that there is no possibility of any lodgment occurring under ordinary circumstances; but in order to be secure, sluice-gates have been placed at certain distances enabling the drains to be flushed by their own water whenever desirable. In addition, a reservoir has been made specially for the purpose of flushing.

The street sewers are constructed below the ground-floor of the cellars, with the view of draining the soil, as well as of removing the refuse water from every part of the houses. Although the rapid and continuous removal of the sewerage before decomposition has taken place prevents the formation of sewer gas, care has been taken to prevent the entry of any bad odours into the houses, and a perfect system of ventilation by inlets and outlets has been carried out for the whole network. All house-owners desiring to make use of the system are obliged to have all the arrangements made under the direction of the administration.

With regard to the execution of the work, a commencement was made in 1867, and as quickly as funds permitted it was carried on. In 1876, about sixty miles of sewers of various dimensions had been completed. The greatest care was taken as regards materials,—the municipality supplied cement, bricks, the inverts, &c., to the contractors, in order to insure the best quality in everything. The cement was constantly tested during the progress of the work to the extent of 25,000 trials, and artisans employed by the municipality mixed the mortar. Only the actual labour was entrusted to the contractors. The constant overlooking of the work caused it to be completed in a manner so efficient that left nothing to be desired. The drains and sewers were constructed with glazed pipes, or built in an oval form with bricks, and, for the most part, with inverts glazed,—the sides being built in mason work, with Portland cement. Care was taken to make these sides perfectly smooth, without covering them with cement. The principal sewer has a height of 6 ft. 6 in., and a width of 5 ft., and the secondary sewers vary between 6 ft. by 4 ft. and 3 ft. by 2 ft. For the small streets with good slope pipes of 12 in. and 15 in. diameter have answered admirably. Fifty per cent. of the work has been done in sewers of 3 ft. by 2 ft., and seventeen per cent. has been done with pipes. The slope varies according to situation and circumstances, but where the slope is greatest, glazed pipes have been used, while the sewers with the lesser slopes have been made so that people may pass through them. The depth of the public sewers below the level of the streets varies from 10 ft. to 33 ft. In the streets of the ancient city of Frankfort the depths have been found down to 22 ft. In general it has been sought to make it from 13 ft. to 20 ft., and the average is about 16 ft. to 17 ft. This great depth was necessary to ensure the drainage of the subsoil and all the cellars, and in consequence most of the public sewers are below the water level or in impermeable clay. This prevents most thoroughly the escape of drainage water, and any infection of the subsoil. All junctions of house drains and secondary sewers with the main sewers, are made at an acute angle with the flow, so that there is no possibility of any deposit or lodgment.

The rain-water gratings are placed at the sides of the streets at 36 yards apart from one another, and all unpleasant odours are prevented by hydraulic traps. Catch-pits are made with 20 in. glazed pipes placed vertically to a depth of 7 ft., furnished with a movable bucket with handle. The sand and small stones, &c., carried down by the rains are received into this bucket, which is, from time to time, raised, emptied, and replaced. These deposits of mineral matters are never offensive, as all putrefying matter is carried off in solution into the main sewer.

For flushing purposes, 320 flood-gates and 200 slides have been provided. In addition forty cast-iron slides, which are ordinarily used to separate the upper from the lower network of sewers, can be used for the same purpose. To carry out this system of flushing, as well as to facilitate the inspection of the public sewers, 700 side entries have been made at distances of 180 mètres apart, opening from the foot pavement.

In order to carry out perfectly the flushing system, collecting galleries have been made at the highest point of the system of sewers, which hold about 2,500 cubic yards of water. This water comes from the land drainage and some surface water, and is used, when it is thought advisable, to flush very completely.

Under ordinary circumstances, all the sewerage is made to empty by the main sewer into the river Maine at a distance of nearly two miles from the ancient bridge, and far beyond any habitations belonging to the town. The pipe, 4 ft. in diameter, is carried out in the middle of the current, some 50 yards from the shore. This outlet, being situated in the bed of the river, and in the line of the quickest flow, has the effect of causing the sewage to be carried off so rapidly as to give no grounds for fear of any deleterious influence to the health of the neighbourhood. In addition, the refuse matters are so dissolved in the water as to show no trace of their existence. It is, however, intended to carry the main sewer about a mile lower down the river, and by means of settling tanks to remove all matter deposited before the water is allowed to enter the river. This deposit will be used for manuring purposes.

The main sewer is constructed so as to take a certain quantity of rain surface-water in addition to the sewage, but in times of very heavy rains there are means by which a large quantity of the rain-water can be diverted and sent direct into the river Maine at once. These rain-water conduits pass by means of syphons under the intercepting sewers running parallel to the river. It is also easy, in time of floods, to lower the water level in the lower network by using a natural channel or depression in the land running parallel to the river Maine for the surface-water, and so causing it to discharge itself near the village of Nied at a point where the water level is 10 ft. lower than at the ancient bridge in the town.

As regards ventilation, the system employed at Frankfort is a combination of outlets and inlets. Wherever an escape of air from the sewers would be hurtful or disagreeable, it is prevented by traps used, as before mentioned, in the receptacles for surface-water by the foot pavements. But wherever an outlet can be had allowing a free escape of air, it is used. Thus, all down pipes of rain-water gutters, when not below or very near windows, are pressed into the service, whether they belong to the town or its inhabitants. The water-closet pipes are carried up through the roof, and are open at the top, so that each house in the town, by means of these pipes, and the down rain-pipes, contributes to the ventilation of the public sewers. In addition, at two of the highest points of the drainage system, and away from dwelling-houses, two large towers, one having the appearance of a huge chimney, over 100 ft. high, have been erected, and through which the sewer air is constantly escaping. Advantage has also been taken of factory chimneys as ventilators. So much for the outlets. It now remains to describe the inlets. These are placed in the middle of the roads and streets, and consist of 9-in. pipes on end with a grating. If needful, disinfecting agents can be placed in these pipes, but a constant inspection proved that, owing to the system of outlets above described being so complete, they acted entirely as inlets, and in no case was air found to be issuing from them, or any unpleasant odour discovered.

The principle that has been the mainstay of the entire project is that every householder wishing to take advantage of the drainage system is compelled to have the connexion carried out under the direction of the town engineer, who will see that all the sinks, closets, &c., are of the proper kind. Not only is this obligatory, but the engineer's authority over all private drains joining the sewers is as complete as it is over all public works. He supplies certain standing rules, accompanied by explanatory plans and models, showing the necessary conditions of this sanitary work. The advantages that have been realised in comfort and health by the inhabitants of Frankfort are due to the conscientious observance of this principle.

The inhabitants are not bound to connect their drainage with the sewer system, but their recognition of its advantages has been such that the administration has been fully employed in making the connexions with private houses ever since the work commenced. Thus, in 1875, 884 houses, representing 2,958 families and 3,977 water-closets; in 1876, 687 houses, containing 2,012 establishments, and 2,517 water-closets had been connected with the sewers; while, at the end of May, 1877, Frankfort contained 3,547 houses, representing 10,333 establishments and 14,349 water-closets that had been joined to the new drainage system. A large proportion of the houses is let in flats, and, therefore, each, including several families, accounts for the numbers of establishments and closets stated.

Up to the end of 1876 nearly 100,000 yards of sewers had been completed, and the sum expended amounted to nearly 300,000*l.* sterling.

The results obtained by this sewer canalisation have been highly satisfactory. First. The complete drainage of the cellars and subsoil has been attained, and the water so obtained

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has been applied to the cleansing of the sewers. Secondly. The cleansing of the public sewers is effected solely by flushing, the work of which is performed by a foreman and four labourers. The greater part of the sewers cleanse themselves by their ordinary flow, while the remainder are flushed from time to time, so as to remove all deposits, mineral or otherwise. Thirdly. The ventilation has succeeded perfectly, so that the outer air has free circulation throughout the sewers; consequently, the sewer air has been so free from noxious odour that there has been no occasion to have recourse to the disinfectants originally contemplated.

The amount of liquid discharged by the network on the right bank of the river Maine amounts to 470 cubic yards per hour, while the amount of water running under the bridge is 650,000 cubic yards per hour. Although the quantity of sewage entering the river is small in proportion to the volume of water in it, the question of its different disposal must be entertained ere long.

Such is the history of the Frankfort drainage, and as its working clearly proves that it is most efficient, so does the reduction of the death-rate to little over 18 per 1,000 prove the town to be one of the healthiest in Europe. It should also be noted that, owing to its charities, an unusual number of aged and sick people are drawn to the town. The fact that a portion of the town is built upon what was formerly the bed of a lake is additional evidence of the efficacy of the drainage. As the system followed is not the same as that most prevalent in other countries, it will be well to notice in what the difference lies. (1.) As before said, the power of the engineer over the house connexions and the apparatus of closets and sinks is absolute, and (2) the system of ventilation. To carry this out efficiently, it has been found necessary to forbid any house-drain being trapped from the sewer or disconnected. Every sink and closet drain has its own special trap, which has been found sufficient, always remembering that the pipe is carried through the roof and has the top open. Thus the sewer air, having a ready outlet, makes no effort to force the traps to find a way of escape. The effect is that the open gratings in the centre of the roadway, instead of sending up noxious odours, as is the case in some of England's health-resorts, act as air-inlets only, and are quite free from smell. The sewer air, being warm, will readily rise to the highest point if encouraged. An inspection of the sewers at the lowest, a central, and the highest points, which necessitated a considerable time being spent inside them, showed that there was no smell of putrefaction whatever. Any person in ordinary health might pass hours in the sewers of Frankfort without any unpleasant effects. The rapid rush of the water, the absence of all deposit owing to the branch sewers and house drains joining at an acute instead of a right angle, and the perfect ventilation before described, all contribute to this satisfactory result. Nothing could be more complete as regards the removal of the drainage.

One cannot say so much as regards its disposal, although the enormous flow of water in the river Maine makes 500 cubic yards of drainage-water per hour a mere bagatelle. It is, however, matter in a wrong place, and must be dealt with. This is intended to be done by means of settling-tanks, the water eventually finding its way into the river. It would be well if this even could be avoided; but in a country where it rains on 120 days in the year it is difficult to do so. It has been found necessary in England to separate the surface from the drainage-water, in order to prevent farms under sewage irrigation becoming swamps. On the other hand, an occasional flushing with extraneous water is an important aid to the efficient working of the sewers; but to all who are interested in sanitary works no better advice can be given than to do what many have already done, viz., visit Frankfort-on-the-Maine.

The Lowder Memorial.—On the 9th inst. the foundation-stone of a memorial to the life and work of the late Rev. Charles F. Lowder, the vicar of St. Peter's, London Docks, was laid, in the presence of a large number of friends, by Earl Nelson. The site of the memorial is immediately in front of the church, on a piece of ground in Old Gravel-lane. On this spot it is intended to erect a substantial clergy-house, for the use of the mission clergy of the district. Mr. Bowes A. Paice is the architect.

SOMETHING OF CAIRO.

WHEN, a few hours after the reception of the first news of our recent victory at Tel-el-Kebir, it was learned that Cairo had been quietly occupied by English troops and its old forts manned with our red-coats, it is no exaggeration to say that a feeling of relief was experienced by all who had watched with any interest the Egyptian campaign. A beautiful and famous city was saved from sharing the fate of Alexandria, a fate which had more than once been dreaded as likely to befal Cairo. Ever since the commencement of the troubles which have carried our troops into the heart of Egypt, the constant fear has been expressed that the hazards of war might at any moment lead to the destruction of Cairo. These fears were felt not alone because Cairo is the capital of Egypt, or because it is in importance, after Constantinople, the second city in the Ottoman Empire. Its antiquity, the beauty of its monuments, its peculiar artistic interest, which have so often excited the descriptive powers of travellers, — English, American, and foreign,—have long rendered Cairo familiar to the West as the ideal of an Oriental city such as the "Arabian Nights" has described, and the theatre and a few painters have successfully brought to the general mind.

Apart from any contemporary interest that may be attached to Cairo at this moment, Cairo, as the pure creation of the Arab conquerors who, now twelve hundred years ago, seized Egypt, holds a place in artistic history such as has long surrounded it, in the eyes of the refined, with a peculiar halo of romance. Till within recent years this romance has been, as it still is to a great extent, fostered by the large share of mystery which enwraps all things Oriental. Travellers' tales have been accepted for want of definite information, and our acquaintance with the Arabs has been made far more through the doings and creations of their kinsmen, the conquerors of Southern Spain, than through the original stock who people the Egypt of to-day.

The architectural interest of Cairo has long been known,—since, that is, the commencement of this century; but the research in a field of the utmost promise has been narrow. From an artistic point of view, we may look with some satisfaction on the recent result of our armed invasion of Egypt, if it is to make us more familiar with the art of the Arabs, the relations of which with our Gothic art is a study of the utmost interest. We shall now, it is to be hoped, become more familiar with Cairo and its architecture, and learn that our admiration for Arab art, as shown in the Alhambra, has led us to overlook its purer and earlier creations in Cairo, where almost the whole development of Saracenic art can be studied.

How much has yet to be learned of this chapter of artistic history may be judged from the very short account which is devoted to the art of the Arabs in Mr. Fergusson's "History of Architecture," and even in this short account there exist statements which more recent research is able to correct.

In some previous papers on the subject,* we have endeavoured to lay before our readers a slight sketch of the nature and origin of the art of the Arabs, an acquaintance with which will be found indispensable to the full understanding of the rise and formation of our own Mediæval art. It may unquestionably be accepted that the great movement of the Crusades contributed not a little to arouse the West from the torpor which had come over it after the fall of the Roman Empire, by bringing us Northerners into contact with a refined and brilliant civilisation. That civilisation we have seen developed entirely under the influences of surrounding circumstances. The Semitic races were anti-artistic; they conquered country after country each in possession of an art and artists the creation of long generations of tradition; of these the Arabs immediately availed themselves; they adopted at first, as we have seen, the old art, gradually grafting on to it the features of the new style, which was eventually to possess so marked a character of its own, and into which the Persian influence was to infuse that peculiar elegance and decorative grace which mark so indefinably all Saracenic art.

In Cairo and its monuments the development of this art can be traced from its earliest manifestations through its most brilliant period down to the present day. With the aid of Fergusson and a guide as competent as M. Prisse d'Avennes,—whose superb and recently-published work on Cairo, "L'Art arabe, d'après les Monuments du Kaire" (Paris. 1875-77. Folio), may be looked upon as one of the most sumptuous artistic productions of the present day,—we shall pass in review some of the artistic features of a city concerning which we may expect for some time yet to hear a great deal.

The Arab historians have exhausted their descriptive powers in the story of the foundation of El Kahirah, or, as we term it in its Italianised form, Cairo. The city which we know by that name is in reality the creation only of the tenth century, the portion known as Old Cairo, or Fostat, being the town which tradition states was built by the first Arab conqueror of Egypt, Amr, on the site of the tent,—Fostat means tent,—he had occupied previously to his famous capture of Alexandria. From A.D. 640 till 969, when Egypt was conquered by the Caliph Moez-le-Din-Illah, Fostat remained the capital of Egypt. In the latter year the conquering caliph built the existing city of Cairo. For two centuries the new capital slowly spread in size, since when, till within the last fifteen to twenty years, it has remained, to all intents and purposes, the Cairo of the Middle Ages.

There stand to this day, and our troops passed under their old arches, as the French did at the beginning of this century, the gates of the line of fortifications erected by the great Saladin, the courteous rival of our own stout-hearted Cœur de Lion; and our red-coats have occupied the citadel which was built by the same great Sultan. Cairo possesses in reality seventy-one gates. Architecturally, however, there are only two worthy of attention, the Bab-el-Nasr, or gate of succour; and the Bab-el-Foutouh, or gate of victories. The former of these, a massive construction, is formed of two square towers, broken only by some graceful mouldings and sculptured heraldic scutcheons; in appearance, as may be seen by any representation, nothing could be less Arabic. The inspiration of its design is clearly Christian; it is only the inscriptions and the delicate balustrade that show to the observant eye that the work is Saracenic. The Bab-el-Foutouh, or gate of conquests, has round, or, rather, elliptical, towers; heavier in construction than its companion, the mouldings are more numerous, and the style generally, in fact, is more Arabic. Of the fortifications themselves a great portion remains, the section of the walls nearest the Tombs of the Caliphs being in the best preservation. There still exist the covered way and machicolations exteriorly. In connexion with the fortifications the citadel deserves mention; built, as we have above stated, by Saladin, in the twelfth century, it still serves as the strongest point of the city. With the now destroyed fortifications of Alexandria, the walls of Cairo form the sole existing specimens in Egypt of the military architecture of the Arabs. There remain in the city a few private palaces which retain their Mediæval modes of defence in the shape of loopholed and machicolated walls, to show us how the Eastern life of those days resembled that of our own more turbulent North; but the interest of Arab architecture does not centre in the remains of its military strength. It is the religious architecture of Cairo which affords the chief field for study, and it cannot be said to be barren or unpromising. There exist in the Egyptian capital over 400 mosques of every period,* by means of which the development of Saracenic art may be traced almost step by step.

Each dynasty of rulers, from the time of Amr down to the Turkish Conquest, early in the sixteenth century, vied in adorning Cairo with sumptuous buildings. With the appearance of the Ottomans this beautifying process stopped; ruin, injury, and neglect are all, we are afraid, that mark their presence in the land which has owned so many masters.

It is almost always in the capital of a country that the chief elements for the study of its architecture are to be found; there, usually, the first efforts are made, and there it is that the accumulated wealth creates the finest buildings. In Cairo the oldest edifices are religious. The greater part of the mosques contain tombs,

* See *ante*, pp. 202, 231, 297, and 326.

* In Cairo proper, 387 mosques; at Boolak, 51; and in old Cairo, 10; total, 448. Built often side by side,—through the vanity or caprice of their founders,—and bristling with minarets, the appearance of the city can be more easily pictured than described.

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contrary, curious to say, to the special injunction of Mahomet, who, with a foresight which it is to be regretted Christian countries have not equalled, forbad, in one of his *hadiths* or traditional sentences, the burial of the dead in the mosques.

Previously to enumerating the more important mosques of Cairo, it may not be out of place to briefly sketch the general character and arrangement of a Mahometan mosque. In the first place, the mosque is not a temple occupied by a god; it is, to use a strictly Biblical expression, a "house of prayer," of contemplation, in which the believers meet to adore the Divinity. What may be termed "worship" does not exist in the Mussulman religion. Mahomet, it must be remembered, preached to barbarous tribes whose forms of worship entirely concealed the Divinity. The rites are of the simplest: an annual festival, ablution and prayer five times during the day, with no other dogma than the belief in a creating and remunerating God. All images are suppressed, from a fear that they might tempt the feeble imagination, and convert the mind to culpable adoration.*

The enclosure termed a mosque (from "Medjid," place of adoration; in Arabic, "Djami") has no form determined by the religious law. It may be square, octagonal, or round, covered over, or open to the sky. We find at Cairo mosques of almost every possible plan. The oldest, it is true, affect a large square, with porticos; those of the later period affect a Latin cross, and those erected under the Turkish rule are often round, after the plan of Santa Sophia. The sole condition required by the law is that the principal interior wall, which is faced during prayer, should be turned towards the east, in the direction of Mekka, considered by the Mussulmans as the house of God and the centre of the universe. The mosque is separated into two distinct portions: one, the outer, which may be entered without the ceremony of removing the shoes, and corresponding in a manner with the *narthex* of the early Christian churches; the other, the inner portion, a species of raised daïs, ascended by several steps, and regarded as of the utmost sanctity. Recessed in the wall facing Mekka will invariably be found in every mosque the so-called *mihrab*, or *kibleh*, towards which the supplicant is turned during prayer. The first *mihrab* built was that of the mosque of Medina during the lifetime of the Prophet. In every mosque it is the portion on which the utmost splendour of decoration is lavished. Elsewhere in the mosque, but always on the eastern walls, will be found other smaller *mihrabs*.

To the right of the *mihrab* is placed the pulpit, termed *mimbar*. The South Kensington Museum possesses an interesting specimen, taken from a mosque demolished in Cairo some years ago. This pulpit on festivals is covered with rich draperies, but is invariably itself richly decorated with carved and inlaid work. The *mimbar* dates back also to the time of the Prophet. In the seventh year of his mission he improvised, it would appear, a small pulpit ascended by two steps, previously to which he had simply leant against the trunk of a palm-tree while delivering to those about him his sacred sermons. In some mosques,—in Cairo, those of Teyloun and El Azhar,—a cupola or baldacchino, supported by four columns, rises above the *mihrab* and the pulpit at its side.

Opposite the *mihrab*, and at a certain distance, is the *dekke*, or tribune, supported by columns and reached by steps; in this the priest, previously to the sermon, delivers to the congregation the rules to be observed, together with a slight sketch of the discourse about to be given. In the mosque proper it may be observed that there are two kinds of *maqsourah*, or reserved enclosure,—one general, the other special. The *maqsourah* is that portion of the mosque surrounded by a wooden railing, and containing the *mihrab*, the *mimbar*, and *dekke*, above referred to. In this only persons of a certain rank are admitted to recite their prayers. There formerly existed in the mosques a special tribune,—*Tekassir*,—reserved for the women, but these no longer exist; in Cairo the custom had been borrowed from the Byzantine churches, and to this day such tribunes are to be found in some of the old houses; in the Mosque of El Agsa, at Jerusalem, the tribune is still used.

The *sahn*, or *impluvium*, is generally square and open, confined on the Mekka, or eastern side, by the *maqsourah*, and on the three other sides by walls constantly to be found provided with porticos, called *liwâns*. In the Mosque El Azhar,—which is, at the same time, the great theological university of Islamism,—the porticos are each set aside for the students of the different provinces and nations who have come to Cairo to be initiated into the mysteries of the religion.

The *mousalla*, or oratory, is situated by the side of the *meidaah*, or place of ablution, a square basin filled with water; and here exist also, for purposes of purification, other basins termed *maqtas*, often reputed, like the Scriptural Pool of Siloam, for their supposed healing powers; but those who object to the stagnant and not too clean water of the *meidaah* use the *hanafiyeh*, in which the water is constantly flowing. Access to the mosque is forbidden, not only to every unbeliever, but even certain portions are forbidden to Musulmans themselves when not in a state of absolute purity, that condition being regulated by precisely similar laws to those of the Mosaic code, and doubtless from the same motives.

The number and position of the minarets,—*maadneh*,—is entirely a matter left to the taste or caprice of the founders and the architect. It is not alone, as is generally stated, the mosque of Mecca which enjoys the privilege of possessing seven minarets; the chief mosque of Herat, one of the most beautiful in Central Asia, possesses no less than nine. When there is only one, it is usually placed above or beside the principal door. The number of galleries or balconies on each minaret is again entirely left to the architect. The name of the founder and the date of the building are invariably to be found recorded in some mural inscription, in picturesque Koufic characters, and thus made a suggestive piece of decoration. As a last detail the ornaments which surmount the minarets and domes are usually in the form of a crescent. This custom dates from the fifteenth century, in which Constantinople was captured by the Mahometans, the symbol of that city being a crescent. Sometimes the termination is varied, as we see in the case of the dome of Iman Chafey, in which it is a ship, symbolic of the ship of faith.

With these general facts respecting the plan and distribution of the Mahometan mosque, its difference from the Christian temple, church, or cathedral will be at once seen.*

* The Korân, it may be further stated, is founded on seven essential principles; on a belief in a single God, of whom Mahomet was, not the son, but the vicar; on penalties and recompenses in another life; on prayer; on alms; on fasting; and, lastly, on the pilgrimage to the Kaabah, an institution of antiquity even in Mahomet's aime, and which he skilfully incorporated into the new religion. Those familiar with Arabic state that no religion possesses prayers to the Deity more exquisite and beautiful than the Mahometan.

THE USE OF STEEL FOR CONSTRUCTIVE PURPOSES.

AT the recent Architectural and Engineering Congress, in Hanover, the above question was treated at some length by Professor Inze, of Aix-la-Chapelle. He attributed the limited employment of steel by architects to their reluctance to depend upon a material which had not been fully tested with reference to the purpose named. Recent improvements in the manufacture of steel have been of such a nature as to bring in a prominent manner before the attention of the profession the question of the comparative qualities of steel and welded iron. Concurrently with this improvement in steel manufacture, the requirements for constructive purposes have been, to a certain extent, modified; hardness being now deemed of less essential importance than strength and toughness. One convincing proof of the position which German steel manufacturers have now attained is afforded by the fact that exports have been made to England for Admiralty purposes.

The trials made in 1875 and 1876 by the Dutch Government of steel girders manufactured at the Harkort Bridge-building Works, were singular in their results. The material of which the girders were composed should have been capable of resisting a strain as great as 38¼ tons to 41¼ tons per square inch, but when the girders were tested they were found to be far inferior to this standard, their strength being, in some instances, as low as about 7¾ tons per square inch. The sample bars cut out of the girders were, however, found, on testing them, to be fully up to the requirements of the contract, so that the inferiority of resisting power must have arisen from causes connected with the putting together of the girders themselves. They could not be rejected, and the disappointment of the Dutch engineers may be imagined. Accorning to Professor Inze's statement, however, they had not been without some warnings on the subject. Taking as a basis the work produced on previous occasions, they had imposed more stringent conditions as to strength, with the idea of arriving at a greater degree of presumptive safety. The remonstrances of the rolling-mills were considered as being prompted by interested motives, and the so-called safety was dependent on the breaking strain without reference to elasticity or toughness.

Elasticity is, however, a most important point in judging a composite structure, as the different degrees in which this property exists in its component parts preclude a strict uniformity in this respect, and the attaining of the expected degree of strength is prevented. The unfavourable results of the trials of punched and riveted steel girders, as compared with the full satisfaction given by those which were bored and fastened with bolts, indicate, the speaker remarked, that more attention should be given to the material used being of a uniform character, really extensible, and not influenced by the process of manufacture, than to the attaining of any degree of safety represented by figures.

After referring in detail to the tests now applied to steel by marine and railway engineers, Professor Inze dwelt on the advisability of the results of any experiments being diffused as widely as possible, with the view of giving confidence in the use of steel for constructions where a high standard of resistance is necessary. He alluded to the theory which English engineers have founded on recent trials, that soft steel is less injuriously affected in manufacture than iron. He also spoke of the trials lately made at Königsberg, in which composite girders of soft steel fully proved the uniformity and reliability of that material. Trials in England as to rust showed that flowing steel is affected by rust to a greater extent than welded iron, but the homogeneous quality of the former causes the rust to develope itself evenly on the surface, while experience shows that it penetrates more or less rapidly into the interior of welded iron.

While a closer and more uniform texture is obtained by the casting of flowing steel and fused iron than is possible in the case of welded iron, it is considered by many that the rolling in the sizes now usual in section iron will be of considerable difficulty in the case of flowing steel. Some steel works have, however, expressed their hope of being able by the judicious formation of the ingots to obviate this difficulty, and in some instances to arrive at a lower cost than is at present possible. Some descriptions of work can, according to the statements of steel manufacturers, be executed in steel at an increased price of only 15 per cent. as compared with that of iron, but the difference in relative cost is more marked in the case of ⊓ iron, Z iron, ⊏ iron, and I iron. Another estimate gives 25 per cent. as the average difference.

In conclusion, Professor Inze remarked that the use of steel for the purposes indicated, while being on the whole preferable to that of iron, was not likely to cause any difficulties of a serious character to such manufacturers as took up the matter seriously.

* We shall continue the subject on a future occasion.

RESTORATION IN VENICE.

A PAMPHLET has been recently published in Venice, with the title of "The Future of Public Buildings in Venice," which is of interest as showing that there is not that unanimity among the Italians with regard to the work of restoration going on in Italy that was recently represented to be the case. It is evident, from a perusal of this pamphlet, that there exists a party in Venice which, although it may be in a minority, does not approve of the refacing of the Cathedral of St. Mark, and must have hailed with delight the action of the English St. Mark's committee in protesting against the proposed rebuilding of the west front of the basilica.

The following extract reads like a paragraph from one of the publications of the Society for the Protection of Ancient Buildings, and shows that the principles of the society are making progress on the Continent:—

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"Restoration means the entire destruction of a building,—a destruction which leaves no remnants to be gathered up, a destruction which is accompanied by a false description of the thing destroyed. Do not let us deceive ourselves upon this important question. It is as impossible, as much impossible as it is to raise the dead to life, as to restore whatever has been great or beautiful in architecture. The unity of its life, the soul that is given by the hand and eye of the artist alone, cannot be recalled. Another soul may be given by another epoch, and a new building evoked; but the soul of the artist of the past cannot be recalled and made to direct the hands and thoughts of the workmen of to-day. To produce a direct and simple copy is an evident impossibility, and in any case, no matter how accurate or elaborate the imitation may be, it will only be a frigid imitation of such parts only as can be copied by the help of conjecture.

And now let us talk of restoration. The whole thing is a lie from beginning to end. You may make a copy of a building, but the ancient building is destroyed, and that more completely, more cruelly, than if it had been allowed to crumble into a heap of dust or had become dissolved into a mass of clay. Nineveh the desolate is more eloquent than Milan as rebuilt.* It may be urged that the need for restoration may arise sometimes. Agreed. Let us look this necessity well in the face and understand what it means. It is the necessity of destroying. Accept it as such, pull down the building, disperse the stones of which it is built, make them into ballast or lime as you will, but do this honestly, and do not put a lie in the place of the truth. Reflect on this necessity before it occurs, and prevent it by taking care of your buildings. Take care of them tenderly, reverently, assiduously, and many generations may be born and die under their shadows. The evil day must come at last, but let it come openly and truthfully, and do not act in such a way that dishonour and misrepresentation deprive them of the funeral offices of memory."

We believe that in the sixteenth century, in which so many Mediæval buildings were lost to us, the assertion so often repeated that this or that building was a ruin or threatened to fall was suggested by nothing more than the classic vision of a Greco-Roman temple of a certain order and a certain proportion, which was proposed to be proudly erected upon the foundations of its predecessor. A new style was substituted for another of a different kind, and little care was wasted upon the old building, seeing that a new one was being given to the world, which, not having the charm, the beauty, the colour of the old, was yet a new and living specimen of the artistic world.

This, however, only partly justifies the rebuilding, and does not excuse the fact that the builders frequently only consulted the exigencies of the moment. For instance, Guido da Polenta erected a monument to Dante, which is thus described by one who had seen it:—"*Egregio atque eminenti tumulo lapide quadrate et amussim constructo compluribus in super egregiis carminibus inciso insigniloque.*" It was added to by others; but, says Foscolo, "somebody not more than half a century ago, reconstructed it with wonderful magnificence, according to the description: an opinion which is not shared by those who look upon it, and reflect upon the vanity of men who, for the sake of adding their miserable names to a monument which appeals to eternity, could alter and obliterate a relic sacred to history."

This reminds one of the exploits of Benson with regard to the tombs in Poets' Corner in Westminster Abbey. Benson restored these monuments, taking care that his share in the business should not be forgotten.

"On poets' tombs see Benson's titles writ,"

says Pope, in the "Dunciad."

The authors recall the proposal with regard to the ducal palace at Venice made by Palladio, who was called in to advise as to the steps to be taken after the great fire of 1577. "Considering," says the great architect of the Revival, in his report, "that the columns are slender, and that the wall over is very thick, that the number of capitals split is thirty-two, and that, even if these were replaced, they would split again, that nature has made man with slender legs in order that he may transport himself from one place to another, it follows that the buildings should be stable! . . . . I have come to the conclusion that it will be necessary to underpin the fabric of the palace with very wide pilasters between the windows from top to bottom, and to rebuild the wall above the arcade, which is injured by the fire, and is out of plumb." . . . .

All the lesser stars of the Classical Renascimento (Renaissance) naturally swelled the chorus; these proposals are full of Ionic and Corinthian colonnades, together with allusions to the barbarous style of the edifice, "*on account of the ugliness of the orders as* well as of their weakness, deformity, and insecurity, we recommend that the whole building be taken down to the foundations, which will enable a new palace to be built, which, for solidity and beauty, will be the wonder of the world."

This was the opinion of the architects of the sixteenth century; happily their advice was not followed by the Municipality, thanks to the opposition of a cultured few, foremost among whom we must name Gian Antonio Ruscone, who attached no importance to the circumstance that the capitals of the columns were in two pieces, seeing that they were still able to do their work, and attributed the want of perpendicularity in the wall over the upper loggia to an optical refinement similar to that which has been recognised to have been practised in the Parthenon and other Greek buildings.

"We do not believe," continue the authors of this manifesto, "in the general insecurity of those buildings, which, having escaped the hands of the renovators, remain to this day; the principle, 'Let us neglect in the present in order that we may restore in the future,' explains more certainly the cause of their actual bad condition. Instead of redoubling their care for their preservation, they restored them; now increased care means energetic means for their preservation; and we accept these as necessary as a surgeon accepts amputation when other methods fail, an operation which is at once distressing and painful, but to which recourse must be had if we wish to save the rest of the body." J. H.

FURTHER MUSINGS ON THE MERITS OF SOME STYLES OF ARCHITECTURE.*

DEPARTING from ancient Hindoo art, and coming down to a much later period, some beautiful specimens of Mogul work, of about the date A.D. 1570, may be observed in the India Museum. They are casts from the Sultana's apartments at Fâthpur Sikri, near Agra, and much resemble the Moresque type of the Alhambra. Some of these floriated designs could very readily be transformed into wall papers *à la* Morris. They possess one of the first essentials of a good diaper or wall-paper, that of pretty equally covering the field of decoration. These ornaments appear to have been originally executed in plaster, and are certainly exceedingly well suited to the correct treatment of that material. In the Moorish buildings at Toledo, Spain, is a rather similar style of ornamentation. For sgraffiatura, also, it might very well be adopted. One is here tempted to quote the words of the Preacher, "There is no new thing under the sun"! For it seems rather remarkable that so many thousands of miles away architectural features exist almost as much akin to our vernacular as in those European styles so much nearer our shores.

The examples of trellis-work, filled in with talc, for windows, which are exhibited in this Museum, of severe, straight-lined, geometric devices, such as interlacing squares and lozenges, closely resemble some of our Elizabethan work. Other far less formal patterns of perforated window-screens, some executed in sandstone, some in lime cement, are essentially Gothic in feeling. They are to a certain extent geometric, and remind one of the Decorated window tracery of England, or the perforated stone louvre fillings-in to windows so characteristic of the Perpendicular towers of Somerset. In Egyptian, in Algerian, and in Moorish work, this beautiful feature of the pierced window-screen much impresses those who live in a colder climate where the sun is seldom powerful enough to render such protection necessary. In this style, and in all Oriental art, whether in furniture, jewelry, pottery, carpets and shawls, or costume, how intrinsically artistic were they in form and skilful in harmony of colour! There is in this same building an elegant door of carved teak, with square panels and metal mounts. Pretty geometric and flowery devices of very refined character fill in the panels. The whole treatment is very suggestive to modern wants where no particular limit as to cost is imposed on the architect.

The conclusion that I have come to, after this brief review of Indian architecture, is that in the detail much is to be learned. Probably in a few years' time it will be as common for English architects to travel through India, sketch-book in hand, as it now is to wander through France, Germany, or Italy, such are the increasing facilities for travelling about inexpensively and with celerity. In Assyrian architecture there is in some of the details a mixture of Greek and Gothic feeling, if one can legitimately name the latter in this manner when in reality it had not commenced its existence. In the basement of the British Museum are two examples of very effective incised stone pavements, the one from the Palace of Sardanapalus III., the other from the North Palace, Koyunjik. Both are elegant designs, the honeysuckle ornament appearing to be of a bolder character, and not so delicate as in the Greek type. By a very few strokes of the pencil, it would be easy to render either of these pavements into a Gothic thirteenth-century design. It seems to me that here one of the inestimable charms of Gothic work is exhibited. It is so *natural*,—the outcome of a common-sense treatment of art, fettered by no unreasonable chains.

I do not intend to further consider the merits of any particular styles of architecture, but rather to generalise. We are living in an age of great restlessness, but vast progress, nevertheless. The Queen Anne movement, notwithstanding all eccentricities, has at least had one advantage,—the far more extensive employment of self-coloured building materials. This has had the effect of fostering commercial enterprise and bringing into the general market many materials which before were scarcely known. For example, the want of a stone to harmonise, yet slightly contrast with, red brick had been felt, and the Dumfries, more suitable in many respects than red Mansfield stone, very well supplies this requirement.

Another material, which is not new, but a revived one,—Roman mosaic for pavements,—has brought a beautiful substance to our aid, with its elegant store of Classic patterns and quiet subdued tones. Without depreciating the merits of Mediæval encaustic tiles, the new advent of Roman mosaic ought to teach us the lesson of reticence in tints.

Gorgeous patterns for tile pavements in little village churches look incongruous as compared with the simplicity of the surroundings. Alas! in time past I have sinned in this way, but now know better. In the churches designed by Wren in the city of London the floors generally have seldom more than a kind of chessboard arrangement of black and white squares of stone or marble, the whole scheme of the unobtrusive paving possessing little variety. It is curious in metalwork how little difference there is between the examples of various styles when a really natural smith's treatment of the material is essayed, *i.e.*, twists and curls, or such forms as iron is readily shaped into. Classic and Gothic, Elizabethan and Queen Anne, almost meet here on an equal footing.

In plaster used internally for decorative purposes, the Mediævalists of the North of Europe were, one may say, "nowhere." The material was only employed because it was a convenient vehicle for the application of tempera painting, and can never have been intended, as a rule, to be left plain and unadorned. For flat surface decoration in plaster itself we must go elsewhere,—to the Moresque of Spain, to Algeria, or to the elaborate work in relief of the Renaissance period. There are, I am aware, a few examples in England of what is called pargeting work,—in Kent, particularly in the neighbourhood of Broadstairs. But such work

* When the Rebecchino, the old street that encumbered the Piazza del Duomo at Milan, was swept away, the following epigram was written:—

"Tedeschi imperatori di dì remote,
Apportar di stragi, e di suenlura
Di Milano atteravano le mura.
Al sol di libertà ora nipote
Per plaudire a un Germanico Sovrano,
Mura e contrada abattono a Milano."

[In ancient days, German emperors, the harbingers of carnage and misery, threw down the walls of Milan. To-day, in the full light of liberty, their descendants, to please a German sovereign, sweep away both wall and street.]

* See p. 360, *ante*.

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is local and exceptional. Some forty years ago "truth in construction" was one of the great watchwords of the Gothic revivalists, but since then some of these ideas have undergone very important modifications.

For example, in most public buildings at the present day, the floors are constructed so as to be fireproof. But as a general rule what is there to view in the ceilings to show that such floors are anything more than ordinary ones? Or, again, in one of the grandest decorative works of modern times, the Albert Memorial, it is notorious that a considerable amount of concealed ironwork was introduced in the interior of the lofty canopy to counteract what would have been the enormous thrust on the four angles. A tyro in architecture must realise that according to all rules the weight above would force out the angles, unless tie-bars at the springing line of the arches had been introduced, as one sees so commonly in Italy, even in the smallest arches. I presume that, as the Albert Memorial was the design of Scott, the great enthusiast and exponent of Mediævalism, he saw no objection to this course, and was glad to get rid of permanent tie-bars which would certainly not have added to the ornamental appearance of the structure.*

In an example lately in my cognisance, it was necessary for a purlin in a roof of considerable span, and resting on a lofty clearstory, to have a bearing of 17 ft. without any intermediate support. There was not height enough between the panelled ceiling and the outer roof to contrive a trussed purlin. A rolled iron joist, however, answered every purpose, but was an awkward thing to exhibit, as the lower part of it would have been visible below the wood ceiling. To have cased it would have looked ugly. The way out of the difficulty was thus solved: the rolled iron purlin was moved slightly, set in such a way as just to clear the ceiling line and be above it, so it cannot be seen from the floor of the church. I expect that if the first principles of the Mediæval revival had been adhered to, this "sham" would have been considered altogether bad and most reprehensible. The gradual change which comes over men's minds in these questions of taste or fashion is very curious, but has been patent over and over again.

The New Zealand Chambers in Leadenhall-street, when first erected, seemed very odd, but time has accustomed us to much more remarkable specimens of revived old-world architecture. We have relegated stucco and graining to the limbo of shams, but do not object to painting iron, plaster, or stone with a flat tint, so that they might be any material whatsoever. Neither is it considered essential that a church roof should be "honest" and open-timbered, and so it is more usual to have a wooden barrel or otherwise panelled ceiling.

It has been left to the able reviver, or, I should rather say, adapter of an earlier style than Gothic, the Byzanto Romanesque of Italy, to take yet another line and boldly display construction without a shadow of concealment. I allude particularly to the new Natural History Museum, where in the great central hall the arched trusses of iron are left with plain unornamented square-edged soffits, which, possibly may be destined to receive colouring some day, but are clearly not otherwise intended to have *appliqué* ornament. Now, the iron being in immediate contiguity with terra-cotta of the most massive and substantial description (rather recalling to mind the solemn grandeur of the Norman nave of a cathedral), it must be apparent that the two materials, the character of each being so very opposite, do not well agree together. This can the more readily be appreciated by comparing the excellent effect of the great arch occurring before the last bay (to the south) of the hall, which is of terra-cotta. I do not think a better illustration of the principle I venture to advocate could be found. At Westminster Hall, as in numerous other Mediæval examples, the splendid open-timbered roof rests most naturally and appropriately on the stone walls. Or take a modern example, the enormous roof of the Midland Station at St. Pancras. The effect of the pointed arch trusses set on solid red brick walls, with the accompaniment of freestone dressing, is more successful (my remarks apply solely to the different *materials* so far as concerns the comparison of the two buildings) than at South Kensington. The span is so vast, the surroundings so different, whilst the bustle and general noise, the roar of the trains, and steam of the engines, all these heterogeneous elements combine in inducing one to realise the wisdom and advantage of employing an iron truss. For, even supposing it could be executed in stone or brick arches, how terrific the thrust would be! The foundation and abutment, too, would have to be of extraordinary and almost impracticable strength. At St. Pancras the glass suits the iron framework. But glass in the roof does not equally harmonise with such a building as this great hall at South Kensington. I presume it was inevitable that there should be top-light, notwithstanding the windows at the sides and north end of the hall.

In this same portion of the Museum much honesty of construction is displayed by the soffits of the rolled iron joists under the great staircase being shown, as well as the non-concealment of the soffits of the stone steps; elsewhere in the building, where iron joists for constructional reasons are necessary, they are shown. All this severity of treatment answers admirably in a museum of natural history, where the leading decoration ought surely to be that of the objects of interest, or the specimens hung on the walls. All the examples must be Nature's handiwork; we do not look for conventionalities. But proceed further, and how very different it is with, for example, a picture-gallery, a concert-room, or other public building, or a private house. There a less austere rule may prevail. Paintings need some more finished accessories around them, and though the opposite mistake has been sometimes committed of making the shell too beautiful, and so detracting from the kernel itself, a building decorated to the pitch of the new rooms at the National Gallery is more appropriate, and harmonises better with the priceless treasures of art around, than the cold, bare rooms of the old portion. But to return to the Museum. The employment of terra cotta as the material for the internal lining of the walls was a most happy idea, admirably suited to the purpose of the building. The variety, too, afforded by the occasional bands of a bluish grey terra-cotta is very pleasing. For a London atmosphere terra-cotta thus used is much superior in effect to the chilly look of stone, which, owing to its absorbent nature, soon collects dirt, or to brick, which must be necessarily more or less porous, and has not the finished look of its grander sister, terra-cotta. Plaster (except, possibly, polished Parian) or encaustic tiles, mosaic, fresco, or tempera, walls covered with mirrors having gilded frames, how far less would they suit the store-house of natural history objects! Terra-cotta seems exactly to supply the want. In London, where it is necessary to go a long way for stone (unlike Paris, where splendid building stone, easy to work, but soon hardening by exposure, is found at the very threshold of the city in profuse abundance), the use of terra-cotta or moulded brickwork, the constituents of which are as near to London as freestone is to Paris, is very suitable, and in many ways better adapted to the atmosphere of a great city. I cannot but think that cutting of brickwork is a mistake. In the first place, I believe it is a waste of labour and strength to hew about a material which had been made plastic; and then, again, the cutting takes off the hard outer skin formed during the baking. Though I will not pretend to say the inner part is soft, it must necessarily be more porous. It is, I admit, difficult for moulded brickwork to be burned quite true, but any little irregularity does not come amiss, as it is a natural result of the process employed. Much of the work where cut brick is employed could have been more cheaply worked in stone.

For many years it has been again and again declared how absurd and ridiculous and wanting in common sense architects must be to design elegant and costly structures with elaborate and minute mouldings, and carving, in a material like stone, which soon gets dingy and black, the pores choked up with soot and dust, finally corroding away to decay and premature death. It has been asked, why not use glazed bricks, tiles, or even majolica, if the cost be not too great, when not only would cheerful tone and colour be given, but there would be a material easily cleaned by the fire-hose, and unaffected by the gases of the atmosphere? Small attempts have in consequence frequently been made in this direction, but as yet in no building of any great importance. I need scarcely say that I leave out of the question the piecemeal employment of polished materials, such as inlay, or granite and serpentine for columns or piers. In fact, it seems a mistake to put polished and dead-looking materials side by side in the same building; they do not well harmonise or consort together. It seems curious that a compromise is not more often made by applying a *semi*-polish instead of a *full* polish. This would brighten up the marble without producing a metallic appearance. There are several materials, incomplete marbles or pudding-stones, like Draycott stone from Somerset, or magnesian limestones such as Hopton Wood, which take a slight polish, and would fulfil the required purpose.

Polish practically abolishes shadow, and thus diminishes that sharpness and crispness of light and shade which one so well sees in a stone or brick building when the grand cumulus clouds of an April or October day suddenly roll away, and a brilliant hot sun bursts forth in a clear atmosphere guiltless of fog or mist. Again, no building constructed entirely of glazed materials (not even polished Carrara marble) would ever have the variety of effect which an unpolished surface gives. The former undoubtedly looks more cheery than the latter on a dingy wintry afternoon near the date of St. Thomas's Day. But wait till spring time comes, with sharp showers and fitful gleams of sunshine, then I make bold to say the quieter building of the two would have the advantage. The glazed substances alter little by age; they do not become venerable. There cannot be much difference between a building just put up and one built fifty years ago. In Italy, where unpolished marble has been used, it acquires a beautiful tone or "patina" by age.

Such, I fancy, are some of the causes which have prevented architecture in glazed materials becoming popular. But internally, when no direct external light can be obtained, or in kitchens, public dining-rooms, buffets, &c., these polished substances have obvious advantages and many uses.

In concluding this brief review of some styles of architecture, it would appear to my mind that the balance, after the scales of the merits of respective styles have been fairly weighed, inclines heavily towards Mediæval architecture. I can say this with all truth, and without avowing myself exclusively an admirer of this and no other. Great freedom is attainable, even in the most severe thirteenth-century work; there are no shackles to gall, but, rather, subtle cords of elastic. When we get to the fifteenth century, still greater freedom becomes possible, without degenerating into mere whims and conceits. In the Queen Anne style, rule or law there appears to be none; architectural details with no meaning whatever are piled up one over another in a happy-go-lucky fashion. Perhaps they happen to look picturesque, perhaps they do not. No one can tell or foresee the result. It is like a game of pitch-and-toss. Buildings like the new schools at Oxford, Renaissance in character, are very different, and show great skill and study on the part of the architect. Though many may regret the style was not a pronounced Mediæval one in this case, yet the originality, without eccentricity, of this great pile obliges the critic to acknowledge how exceedingly well it is done, certainly as far as the exterior goes, all that the public now sees. In plain words, though Renaissance in detail, and severe Classic in its symmetrical plan, &c., the structure is Mediæval in spirit.

There is one structural feature in Gothic architecture which no other style can equal or approach. I allude to the pointed arch. However much opinions may differ as to the relative beauty of the semicircular and pointed arches, there can be no question as to the superiority of the latter as regards strength to carry weight, the material reduction of thrust, and consequent saving in abutment; there is likewise the advantage in vaulting where it is necessary to contrive ribs of different spans, but the same height from the spring to the crown. There is also a charm and variety in the pointed arch, owing to its having a strongly-marked centre and consequent lightness of effect.

The class recently formed at the Architectural Association for the study of Mediæval architecture, with the excellent examples of which England is so thickly studded, is a wel-

* It will be remembered that tie-bars were introduced at first, and left for some considerable time after the work was done for precaution's sake, so that it might take its bearings, which led to an unfounded rumour that they were indispensable and must always remain.

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come sign to those who have been faithful to their old love, and a signal to those who have departed from their former allegiance, to come back! We have lately lost two giant architects in this style. How can we better evince our respect and regard for their memories than by following on in their footsteps, and showing that the remembrance of the teaching they inculcated by their buildings has not died with them, but will remain green and flourish for many a long year to come?

B. EDMUND FERREY.

ANCIENT ARCHITECTURAL AND FURNITURE DETAILS IN THE BRITISH MUSEUM.

AMONG the immense collection of articles in the upper rooms of the Antiquities Department of the British Museum, we come upon a good many items which are of interest and significance in their relation to architectural style and architectural history. In the new Etruscan room, in the Egyptian rooms, in the Greek and Roman "vase-rooms" (as they are called), we may find among odds and ends of sepulchral memorials and furniture, and in the numerous paintings on the Greek vases, curious examples of ornaments which seem like the first hints of details familiar in their complete form to every architect. Sometimes we are struck by finding, in the archaic work in two different rooms, and belonging to two different peoples, details of remarkable similarity, and which seem to betray the close relationship of the art of the two countries in their archaic period; just as we find, in old German and old English, words which were nearly similar in both languages originally, and have assumed more diverse forms as each language has developed its own idiosyncrasies. At times, too, we may be surprised by the remarkably modern appearance of some detail amid work which is otherwise far removed from any similarity to modern art,—a phenomenon tending to show how the same class of article for practical use sometimes suggests the same kind of treatment to artificers as far apart from each other in time and general circumstances as can well be imagined. To those of our readers who are either not within daily reach of our great national collection, or who may feel grateful to those who will pick out for them things which they have not time to pick out for themselves, it may be of interest to see a few collected examples occasionally of the curiosities of architectural and quasi-architectural detail which may be picked out from the "anticks," as Edie Ochiltree would have called them, in the said collection; and we give sketches of a few such in the present number (see p. 407).

Since the removal of the Egyptian mummies and other remains into their new rooms, from the present Greek vase-rooms, where they were formerly to be seen, sundry pieces of Egyptian furniture have been collected into two cases, where they are more accessible for inspection than they were in their former position; and a very curious collection these make, partly illustrating very good qualities of design, partly showing how very old are some of the special tendencies and idiosyncrasies of furniture design. The chair front which occupies the principal place in one of these cases, numbered 1 in our illustrations, is known to many of those interested in furniture design, and has, we believe, been engraved, but it is very probably new to many of our readers, and is worth calling attention to as an admirable specimen of simple and effective furniture design. The legs and framing are of ebony and ivory, the ivory being used solid in the small tie-bars between the seat and the horizontal rail, and also in the two ends or caps of the horizontal rail where it is fitted into the legs; at the top portion of the legs, and at the neckings of the horizontal bar, the ivory is an inlay. In front of the legs, just above the moulded portion, is a small panel of white ivory with a red centre. The lower part of the legs is moulded in very small mouldings commencing as shown at C, and then continued in a repeating group of two square fillets with a rounded bead between them, each group separated by a slight hollow, down to the foot. For good taste and effectiveness this is almost a model piece of furniture; it is, however, curious, even in this instance, to see how the prevalent details of the architecture of the period reproduced themselves almost unconsciously in the furniture, just as they have done in other periods; for the form of the ends of the horizontal bar in this case is obviously that of the Egyptian capital, with its hollow bell and its striations at the necking, repeated on a small scale, and turned horizontally instead of vertically. A more curious example of this imitation of architectural forms is shown in the Egyptian bottle, sketched as figure 8, which is little more than the model of the column and capital executed in glass, except with the variation that the lines of the necking are spiral instead of being horizontal. The design is not unsuitable for a bottle, if we did not know the form first as that of the Egyptian column; but, to those who made it, it evidently was the column in miniature, and comes, therefore, under the same kind of category as the jewelry in imitation of larger and different kinds of objects, which is so common in shops at the present moment, and is usually considered (and rightly) to represent a vulgar taste. The Egyptian example of this false taste is not nearly so objectionable as many modern examples, for the very reason that it is slightly altered so as not to be an entirely realistic imitation of the original object; but it shows, as many other things in antique art remain to show, that some of the prevalent forms of bad taste in our day are not so exclusively modern in spirit as we are sometimes told.

The cross-legged chair, figure 2, from the same room as the other, is so different in style that we may well believe that the two belong to a period a considerable distance apart from one another, or else that changes in taste were as rapid in Egypt as they are now; which latter would, however, be an improbable or impossible conclusion, seeing the decisive evidence to the contrary which Egyptian architecture affords. The method of producing the ornament is, however, similar in one respect to that of the last example; it consists partly of ivory inlay in wood, the eyes and long stripes behind the heads being formed in that way, though the wood in this case is not ebony, but a dark brown wood. The ornament at D is produced by inlay of apparently another wood of very red tint and lighter than the ground. This chair illustrates a fashion which seems to have had its turn in every country at some time or other, of using animal forms as a portion of furniture design. It is not very easy to identify the animal which has formed the model in this case; it is a bird of the duck species, apparently. The fancy is a piquant one, but the bird's bill grasping the bottom rail is not a very fortunate fancy for the purpose, as it looks very weak just at the point where strength is required. No. 3 is another example, and a much better one, of the adaptation of animal form, from a portion of a wall-painting in the Egyptian Court on the ground-floor of the British Museum. Mr. Lawson, the sculptor, appeared to have used this form for the seat for his "Cleopatra," exhibited at the Royal Academy last year.

But the most curious fact in this collection of remains of Egyptian furniture certainly is, that the forms sketched in figures 4, 5, and 6, should be found among the work of the same people who have left the chairs just spoken of behind them. Those chairs, No. 1 especially, are eminently antique in spirit, quite removed from the forms and fashions of the present day; but the fragments, figures 4 and 5, might actually be parts of the legs of a common-place modern table or wooden bedstead. They do not seem to show anything analogous to what we generally understand as Egyptian work; they show pretty plainly that wood-turning was practised in ancient Egypt, and they suggest the conclusion that there is something in the process of turning which naturally leads the workman who carries it out to adopt somewhat the same kind of outline and character in his work, independently of his special period and surroundings. In figure 6, which is cut square and not turned, there is a more special character; but the other two might have been the work of a joiner in our own day. No. 7 is another example of the introduction of architectural features into cabinet work; a half of a lotus capital cut in wood, and evidently originally *appliqué* as a part of the exterior design of some piece of cabinet-work, just as Classic pilasters are often applied in cabinet-work at present.

The tendency of objects which are turned to take somewhat similar forms at whatever period they are executed receives another illustration in a bas-relief representation of some article of furniture which occurs on one of the long panels of the Etruscan terra-cotta monument which formerly stood at the top of the Egyptian Court in the British Museum, and is now transferred to the centre of the new Etruscan room. This bas-relief, sketched in figure 13, shows just the same character of design as has been found in modern turned work so frequently, and reminds one in general outline of some specimen of a Roman or Renaissance candelabrum, with its marked horizontal discs dividing it into sections. The remaining sketches, except figure 19, come from the Etruscan room, and show curious examples of rough forms of Greek and Roman work. Figures 9 and 10 are from that same sculptured Etruscan sarcophagus from which No. 12 is taken; they form the terminations of the angle pilasters, two of which are finished as No. 9, and two as No. 10. There seems to be a great deal of architectural history hinted at in these two details. The rough form of the honeysuckle ornament is obvious at once; but the most remarkable features are the single and double capital, which seem between them almost to supply a connecting link between the Corinthian and Ionic capital, or at least to suggest that there may be such a connecting link, and that the two forms might have had something more like a common origin than has been usually supposed. The form in figure 9 represents the Classic capital of the so-called Corinthian type *en bloc*, the leaves growing from the base of the capital, and the volute at the angle; it is, in fact (more curious still), almost exactly like some specimens of transitional Gothic capitals. But the form in fig. 10, which consists simply of the fig. 9 capital continued downwards the reverse way, results in a form very closely resembling the main features of an Ionic capital set vertically instead of horizontally. It has been suggested, by Mr. Fergusson, that the Ionic capital was derived from a Persian vertical form of the same kind; these two forms, occurring on the same object, serve at least to show how naturally the Ionic form may be related to the more common form of the Corinthian type. The Ionic feature in its horizontal position is roughly shown in the small capital from a sepulchral coffer, fig. 13; but we confess this example looks more like a corruption of Classic work than a forerunner of it, and probably belongs to a much later period than the sarcophagus before named: it is interesting as showing an unusual combination of the volute ornament with a kind of repeated scallop ornament, like the lower termination of a series of flutings. This latter ornament is shown the reverse way (the way it was generally used in Roman detail) on the right hand side of fig. 9, where it runs along the upper side of the bas-relief panel of the sarcophagus, from pilaster to pilaster. In this form it is almost a pure Roman ornament, or rather became so subsequently. In fig. 14 we see its employment on both cornice and base of an Etruscan sepulchral chest (about 2 ft. square). It is impossible not to feel that there is some connexion between this and the radiated scalloped ornament over the head in fig. 11. Here it represents evidently a kind of crown or diadem. Is that the origin of the form, and was it used as a straight cornice ornament subsequently? It might seem not unnatural to suppose so; but in the present instance the mask with its curved diadem is probably not so old as the sarcophagus from which Nos. 9 and 10 are taken. The mask,* with its curious side ornaments (so exactly in the shape of a well-known feature in Cashmere stuffs) belongs to a set of relics discovered by Signor Castellani at Capua, and collected in one case in the Etruscan room, but apparently of very different dates. A considerable number of them strongly resemble archaic Greek work, while one or two seem to belong to the complete Classic period, and to be Roman imitations of Greek work. The one given in figure 11 may be midway between the older and more recent contents of the case in question, which may have been found at the same time, but certainly cannot be all of the same date. The painted ornament on the base of this example marks it as archaic in character; it is

* In this and other similar masks in the same case it is curious to observe that the ears are sculptured not as they would be seen in a front view of the head, but as if spread out laterally from the head; an incident which is analogous to the treatment of the eye in painting by people who had not come to their perspective. The Egyptian painter painted a full eye in a profile face, because he could not represent the eye sideways: an Etruscan sculptor seems to have represented a full ear on either side of a front face in basrelief, because he could not carve an ear as seen from the front.

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in fact, an inchoate and disjointed form of that Protean ornament, the square fret pattern, which takes almost every imaginable form. All the terra-cotta masks of the same character, in the case of Capuan terra-cottas referred to, have an ornament painted along the front of the slab or abacus which forms their base, and these painted ornaments are very interesting in the various forms in which they present well-known types of Classic ornament. Four others are given in figures 15 to 18, all painted in the same position as that at the foot of figure 11, either in black or in black and red on the terra-cotta ground; the solid colour in the drawing representing black, and the shaded portions red. No. 15 looks like another early form of square fret pattern; No. 17 is an exceptional form; No. 18 shows the guilloche pattern painted on the flat in thick lines, with a dot in the centre of the eye. No. 16 shows a more elaborate, but still defective, form of the square fret, in black and red; defective because the interior red parallelograms have no connexion with the flow of the ornament, but are only stuck against the margin of the space. In the manner of putting the ornament together there is some resemblance between this and the purely Egyptian form shown in fig. 19, from a mummy-case of the Roman period in Egypt. Both of these, though not ineffective ornaments, are imperfect as compared with the true Greek type, because their parts are only arbitrarily put together, whereas the perfected Greek fret is a continuous and self-generating ornament.

There is more to say on the subject, to which we hope to return.

SITE OF ROMAN POTTERIES ON THE BANKS OF THE MEDWAY.

MY researches on the site of Roman potteries, on the south bank of the Medway, have extended over many years, and are yet in progress; for the district is very extensive, and only accessible at low water. I was introduced to them by Mr. Harrison, who, at the same time, brought me acquainted with the Rev. John Woodruff, of Upchurch, who had collected a large number of specimens of the fictile vessels fabricated in the potteries in the low land to the north of Upchurch, now called the Upchurch Marshes. With him I was ever on most friendly terms up to the time of his death. One of his latest acts of kindness was the entertainment of a party of the more enthusiastic members of the Congress of the Archæological Institute at Rochester, whom I conducted to the marshes, and then to inspect his collections, now inherited, together with his antiquarian taste, by his son, Mr. Cumberland Henry Woodruff, F.S.A. Having thus made good my footing in this somewhat out-of-the-way district, I paid many visits, from time to time, on foot, from Otterham Creek, beyond Lower Rainham, to Lower Halstowe and to the marshes leading to Sheerness, which enabled me to judge of the wide extent to which the land had been worked by the potters; and, also, to discover traces of what I conclude were some of their habitations.

At the same time, Mr. James Hulkes, through Mr. Humphrey Wickham, placed his yacht at the service of myself and friends. It was under the command of Mr. Henry Coulter, whose acquaintance I renewed when I came to reside near Strood, finding in him a warm-hearted and generous friend, whose loss to me cannot be replaced. His death was accelerated by one of the periodical overflowings of the Medway, on which I have much to say. By means of the well-provisioned yacht, armed with probing rods and light spades, and mud boots, we never failed to extricate from the creeks large quantities of pottery, which for some flaw or imperfection had been thrown aside by the makers. Of almost infinite variety in shape, dimension, and pattern, the pottery has generally such a marked character in colour and ornamentation that it has acquired the name of "Upchurch Pottery," although it is not to be supposed that it was made nowhere else; yet, such was the extent of the manufactories, that it must have been sent to various parts of the province, the situation being well adapted for conveyance by water.* Like modern pottery, the manufactures of the ancients can often be recognised by certain distinctive peculiarities, as, for example, those in the district of the New Forest, at Ewell, and at Caistor; each has a very marked character, and all are different from the Upchurch fabric.

These marshes are an interesting study for the geologist as well as the antiquary. When the Romans inhabited and worked the land it lay high and dry, and the Medway must have been confined within comparatively narrow limits. It was probably some time after the Romans had left before the sea began to make inroads and submerge hundreds of acres. There was time enough for the earth to accumulate 2 ft. or 3 ft. over the *débris* of the kilns ere the creeks formed and washed the remains into their beds where we now find them. As wide tracts of good land have been lost within the memory of man, it is probable that the serious change did not take place before the Middle Ages; and it is too certain that in modern times the inundations are rapidly increasing. The Romans understood embanking, as their noble works on various parts of the sea coast demonstrate, and they regarded the public health and safety, the *salus populi*. On the western bank of the Medway, where the land is yearly submerged, Roman funereal interments are found, and the same at Strood. Here we have clear evidence that in the Saxon times the floods which are yearly allowed to carry with them, desolation, disease, and death, were then unknown. The Saxon cemetery adjoined the Roman, and both were secure from any apprehensions of deluges. History and science warn in vain. A rich corporation in a cathedral town with a large population, year after year, placidly permits a ruinous watery devastation which common engineering skill could stop for ever in a very short time. With land, houses, and streets periodically standing 3 ft. and 4 ft. in salt water, impregnated with pestilental matter, it is the height of irony and mockery to hear talked about, as being actually in existence, a Medway Conservancy Board and a Corporation.*

INTERNATIONAL SANITARY CONGRESS, GENEVA.

FROM beginning to end the congress has been one long success. Nothing has occurred to mar the general harmony, and the representatives of no fewer than twenty-four different countries have met day after day, and, in spite of all the differences of opinions, politics, interests, and nationalities, no unpleasantness has arisen. The common object held in view sufficed to unite all these heterogeneous elements; and, were it but for this motive, such congresses should be encouraged. Yet, out of more than 400 adherents, we only recognised fifteen English names, and did not meet more than ten Englishmen.

It was no easy matter to follow the transactions of the congress, divided into five sections, and meeting each in different rooms, particularly as it was in these sections that the subjects which interested us most were generally debated. At the general meetings, held in the afternoon, the subjects of debate were scarcely so well selected as at previous congresses. The opening *séance* was given over to congratulatory addresses, which we have already described;† but, on the second day, an unusual crowd gathered to hear M. Pasteur, who had reserved for the special benefit of the congress the statement of the results attained by his most recent researches. These related to the virus of hydrophobia. M. Pasteur had discovered a special microme in the saliva and blood of persons dying from this fearful poison. By cultivating the microme, and reducing its virulence, he hoped to compose a vaccine that would protect animals, and perhaps human beings, against the dreaded danger of hydrophobia. This, together with many other facts and experiments, sufficed not merely to elicit the applause of the medical members, but was listened to with equal interest by the architects, engineers, and the general public present. In the evening, a brilliant party was given at the country residence of Professor A. de Condolle, the son of the celebrated botanist.

On Wednesday the subject of discussion, relating to the contagious nature of phthisis, was of more special interest to us; for, while the doctors disagreed as to the poisonous effects of the *Bacillus*, in determining tuberculosis, every speaker admitted that the prevalence of consumption would be reduced by improved sanitary measures. To architects and engineers, by securing the better ventilation of dwellings and the exclusion of sewer gas, appertained the all-important task of reducing the prevalence of consumption. Indeed, an English speaker suggested that experiments should be made with the *bacillus* found in the sputa of consumptive patients and sewer gas and sewer water. If it was found that sewage favoured the development of this animalcula, it would greatly accentuate the necessity of sanitary improvements in drainage matters. The same afternoon, Dr. G. Varrentrapp, Sanitary Councillor at Frankfort-on-the-Main, described the institution of holiday colonies in Germany, by which the feeble children of the poor were sent for several months in the country, and gave some conclusive statistics to prove the very marked and favourable influence such measures had produced on the health of the working classes. In the evening an excursion was made to see the water-cure establishment of Champel-sur-Arve, where refreshments and music greeted the members of the congress. But Thursday was the great holiday. The splendid saloon steamer, *Mont Blanc* conveyed nearly 400 members of the congress first to Evian-les-Bains on the southern side of the lake, and then to Montreux on the north side. Lunch at Evian, and a banquet at the Montreux Kursaal, were the more welcome, as the long enjoyment of the pure air on the lake had stimulated even the most sluggish appetites. The Municipality of Montreux had provided the banquet, and, after the feast was over, the inhabitants of the entire neighbourhood vied with each other in the display of fireworks and illuminations. From Villeneuve to Vevey the entire coast was ablaze with Bengal fires, long garlands of Chinese lanterns, and the bright display of rockets. Every now and then the valleys re-echoed the boom of the guns fired in salute to honour the members of the congress. This startling demonstration took every one by surprise. The fairy-like appearance of the coast, the heart-felt sympathy that this spontaneous demonstration betokened, deeply moved the admiring and wonder-struck guests of the Swiss Republic. Loud were the cheers, enthusiastic the waving of hats and handkerchiefs, as finally we steamed away from this Venetian fête organised in our honour.

The general meeting, held on the Friday, brought forward M. Paul Bert, member of M. Gambetta's Cabinet, as one of the speakers, and he was followed by Dr. W. Marcet, member of the Royal Society. The subject discussed was the hygienic and therapeutic influence of mountain air, and it was agreed by all that a moderate altitude, that is from 3,000 to 5,000 ft., was calculated to restore strength, even to increase the size and capacity of the thorax, and was admirably adapted to revive the intelligence and energy of professional men who had lost tone through overwork. In the evening there was another reception, this time within the town itself, at the mansion of Madame Eynard, where many of the *élite* of the Geneva society met to greet the members of the congress.

Finally, at the general meeting of Saturday, the prevalence of blindness was the topic for debate. The opening paper was read by Dr. Haltenkoff, followed by Dr. Roth, who represented the London Society for the Prevention of Blindness, and maintained that two-thirds of the cases of blindness could have been prevented. There were 300,000 blind persons in Europe, and this represented one to the thousand of the population. Then came the farewell speeches, the votes of thanks, and finally the resolution, carried in response to a cordial invitation, to hold the next International Sanitary Congress at La Haye, in 1884. We may, therefore, as well, at once, give notice that communications relating to the next International Congress, which will be held two years hence, may be now addressed to Dr. van Overbeck de Meyer, Professor of Hygiene at the Utrecht University. Thus the members of the English professions connected with the preservation of public health will not be able to urge, as an excuse for their absence, that they have not been warned in time. Holland is easy of access from England, so that we shall hope to meet a far larger number of our fellow countrymen two years hence.

Needless to say, that the farewell banquet, held after the congress had finished its work,

* I have printed in the sixth volume of the "Collectanea Antiqua" an elaborate account of the site, together with engravings of the leading types of the pottery.

* From vol. i. "Retrospections, Social and Archæological," by C. Roach Smith (now printing).

† See pp. 349, 364, *ante*.

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was a most enthusiastic gathering. The foregoing brief sketch of the general meetings gives but a feeble idea of the labours of the congress. The most important work, especially in what relates to architecture, was done in the sections, and to this we may return when we have collected and studied the documents. For the moment, we were merely anxious to give a general idea of this most important and successful meeting; and, above all, to at once express our gratitude and high appreciation of the cordial welcome received.

LARGE EXPENDITURE IN RAILWAY AND TRAMWAY WORKS.

AN analysis of the railway, tramway, town improvement, and other Bills for the construction of public works which have received Parliamentary sanction during the session which has just closed is of an exceptionally interesting nature, as showing the immense increase which is going forward in the number and expenditure of these several undertakings. The entire number of private Bills introduced into Parliament during the late session was 303, of which 228 have now become law.

The number of these applications has been increasing year by year, more especially as regards railways proposed by existing and new companies, as the subjoined figures will show. During the session of 1882 the Bills promoted by existing companies were 104 against 85 in the session of 1881, and the length of proposed new lines by these existing companies in the present year was 591 miles against 381 miles in 1881, the amount of capital required for these undertakings of 1882 being 36,863,798*l.* against 21,700,496*l.* in 1881. The railway Bills promoted by new companies in 1882 were 60 against 34 in the previous session. These proposed new lines showed a length of 789 miles against 433 miles in 1881, and the amount of capital to be raised was 45,798,509*l.* against 11,941,396*l.* in 1881. Combining the existing and the new railway companies, their Bills in 1882 numbered 164 against 119 in 1881, the total length of proposed new lines 1,380 miles against 814 miles, and the amount of capital to be raised 82,662,307*l.* against 33,641,892*l.* in 1881, or an increase of nearly 49,000,000*l.*

Of the total number of 164 railway Bills which have been investigated during the present year, 92 have received Parliamentary sanction. Of this number, 34 were Bills in connexion with amalgamation, purchase, and other arrangements. Of the remaining Bills promoted by existing companies 36 have become law. These several Bills are for the construction of an aggregate length of 396 miles of additional railway and other works by the respective companies, the capital required for which is 25,178,833*l.* Amongst the largest items are 3,200,000*l.* for the construction of 32 miles of new railway by the Hull, Barnsley, and West Riding Junction Company; an expenditure of 2,141,000*l.* by the South Eastern Company in new railways from the Charing-cross Station, and other works; 2,000,000*l.* by the Great Northern Company; 2,000,000*l.* by the Midland; 1,832,000*l.* by the North-Eastern; 1,760,000*l.* by the Caledonian; 1,666,600*l.* by the London and Brighton; 1,333,000*l.* by the London and South-Western; 1,280,000*l.* by the Lancashire and Yorkshire; 1,000,000*l.* by the London and North-Western; 820,000*l.* by the North British; 800,000*l.* by the London, Tilbury, and Southend; 733,000*l.* by the Great Western; 641,666*l.* by the Great Eastern; and 560,000*l.* by the Wrexham, Mold, and Connah's Quay Company. The Didcot, Newbury, and Southampton Company's Bill likewise authorises them to expend 1,330,000*l.* in the construction of 45 miles of new railway.

The number of Bills sanctioned, promoted by newly incorporated companies for the construction of entirely new railways, is twenty-two. These Bills authorise the construction of 271 miles of railway, with a capital expenditure of 19,280,333*l.* Some of these undertakings are of unusually great magnitude, the heaviest being the Regent's Canal, City, and Docks Railway, 19 miles in length, the proposed capital for which is 10,490,000*l.*, including 1,600,000*l.* to be expended in the purchase of the Regent's Canal. The next undertaking in order of cost is the Metropolitan Outer Circle, 29 miles in length, with a capital of 2,666,600*l.* The Mersey Overhead Dock Railway, 7 miles in length, is estimated to cost 650,000*l.*; the Glasgow and City District line, 3 miles in length, 733,300*l.*; the Tilbury and Gravesend Tunnel Junction, 4½ miles in length, 600,000*l.*; and the Wimbledon, Merton, and West Metropolitan, 3 miles in length, 200,000*l.* The Charing-cross and Waterloo Electric Railway is also amongst the number of the new undertakings. The length of this proposed line is about three-quarters of a mile, and the estimated cost is 133,000*l.* From Charing-cross the line is to pass in subway under Northumberland-avenue, the river Thames, College-street, and Vine-street, to a point adjoining the London and South-Western Railway terminus.

The entire length of new railways sanctioned to be constructed by existing and new companies, is thus 667 miles, and the amount of capital to be expended in their construction is 44,459,166*l.*

The number of Bills sanctioned during the session for the construction of new tramways was twenty-one, authorising 120 miles of tramway at a cost of 1,217,500*l.* Of this number seven of the Bills authorised the construction of 30 miles of tramway in different parts of the metropolis, the capital for which is 837,500*l.* The metropolitan companies which have obtained these various powers are the London Southern Tramways Company; the London Street Tramways Company; the North London Suburban Tramway Company; the North Metropolitan Company; the Norwood and Crystal Palace District Company; the Peckham, East Dulwich, and Crystal Palace Company; the South London Tramways Company; and the West Metropolitan Tramways Company. In addition to the above there were twenty-seven applications to the Board of Trade for Provisional orders to construct an aggregate length of 124 miles of tramway, at an estimated cost of 517,611*l.*

The number of gas and water Bills passed was thirty-one, in addition to twelve applications for Provisional Orders. The proposed capital for the works under the several water Bills sanctioned is 1,809,000*l.*, in addition to 342,708*l.*, the estimated cost of gas and water undertakings under Provisional Order applications. The capital for the intended new waterworks at Bristol is 400,000*l.*; 400,000*l.* are also required for similar works at Manchester; 187,500*l.* for further works by the South Essex Water Company; and 181,250*l.* for extended works at Windsor and Eton.

Amongst the other Bills passed during the session were twenty-two in connexion with dock and barbour works, and thirty-five town improvement and sanitary Bills.

MARBLE WORK AND OTHER DECORATIONS AT THE DUBLIN EXHIBITION.

THE high degree of excellence attained by Irish artisans in the department of artistic marble work in Ireland has given a stimulus to the genius of Irish architects and artisans engaged in the designing and execution of such work. The country supplies some of the most beautiful kinds of marble from those of her quarries that are now worked. The display of artistic marble work at the Dublin Exhibition includes many kinds of ornamental sculpture and carving used in churches and in private houses. The chimney-pieces are mostly of Irish marble (Midleton red and Galway), exhibiting taste in design and goodness of finish. The most important work exhibited is a pulpit executed by Messrs. O'Neill & Co., of Dublin. It is of large size, and stands upon nine polished marble pillars, resting on a base of white granite. The eight outer or smaller pillars are of Irish green of the same material. The capitals are of mottled marble, carved, presenting a beautiful contrast with the grouped figures in the panels. Another specimen of ecclesiastical sculpture is a high altar by Messrs. Pearce & Sharp, of Dublin. Imported white marble being the principal material used, it presents a very chaste appearance, the carving, polishing, and tracery exhibiting much artistic skill. All the coloured marble used is Irish, and the labour expended upon the entire work has been that of Irish sculptors and artisans. The altar is from a design of Mr. G. C. Ashlin, architect, and it is intended for Kilfinane Church, county Limerick. A collection of chimney-pieces of Bardella and other marbles is exhibited by Mr. J. Chapman, of Dublin, who also shows a number of circular tables inlaid with Irish and other marbles of different colours. A baptismal font of Irish and Italian marbles is also included in this collection. Two highly-finished chimney-pieces, with fenders attached, made entirely of Irish marbles of various colours, are shown from the Kilkenny Marble Works. Three marble chimney-pieces in Carrara, Italian, and Irish marbles are exhibited by Mr. John Coates, of Dublin. Mr. W. Birney also exhibits a collection of mantelpieces of different coloured marble,—Irish and foreign. Two of them are entirely of Irish marble. Two Italian statuary marble chimney-pieces, well carved, are shown by Mr. W. Haliday, of Dublin. The spandrels are perforated and relieved with a background of Midleton (Cork) pink marble. An interesting collection of marble work is that of Messrs. Ryan & Sons, of Dublin, comprising three carved and inlaid mantelpieces in Irish and Italian marbles of beautiful pattern and finish, a polished urn of variegated marble, and marble crosses.

PROPOSED TESTS FOR MATERIALS USED IN DRAINAGE CONSTRUCTION.

THE *Deutsche Bauzeitung*, of Berlin, has lately called attention to the importance of special tests for the materials used in drainage constructions, in view of the increasing adoption of the modern system of sewerage in the various cities of Germany. It is remarked that the tests used in connexion with the construction of open water-courses are of no practical value when applied to drain-pipes, even when materials of an analogous character are employed. This arises from the nature of the liquids carried through sewer-pipes, which contain, in most cases (although in a very diluted form), a certain percentage of alkalies and of different acids,—the latter being found in greater abundance in the sewage of industrial towns. Thus it is suggested that the tests of the materials used in constructing drains should be conducted with a view to determine their properties of resistance to muriatic, sulphuric, and nitric acids.

Some time ago Dr. Kämmerer, of Nuremberg, instituted a series of tests of this description, with special reference to the drainage works of that city. Pieces of the various substances to be tested were left for a certain length of time in a solution of one per cent. of sulphuric, muriatic, and nitric acid, or ammonia, and their loss in weight was accurately observed.

The results arrived at showed that ammonia exercises an effect of such slight importance that its action can, as a rule, be disregarded. The destructive properties of muriatic and sulphuric acid were, however, fully demonstrated. In the various kinds of brick the loss was from ·02 to 23·50 per cent. The losses in the instances of concrete and cement pipes varied from 13·94 to 37·11 per cent. Glazed pottery-ware pipes withstood the influence of the acids better than any of the other kinds tested, their loss only being from 0·13 to 0·17 per cent.

These tests, which were made in 1878, were noticed at the time in various technical journals, and although they led to the prohibition of the pouring of the refuse water from chemical factories into the sewers of Nuremberg (mostly built of cement-concrete), they have not been regarded to any appreciable extent in the smaller towns in Germany. Cement-concrete and cement pipes do not, however, seem to be used in the more important drainage operations in the principal German capitals.

In connexion with the destructive influences of certain acids upon substances containing lime, silicate of lime, and more particularly carbonate of lime, it is remarked that mechanical causes also act in an injurious manner. When the lower part of the drain is attacked in such a way that a cavity is formed, solid matters sink into it, and in smaller drains a stoppage may after a time result.

The expenses of excavation and other labour bear such a heavy proportion to the total cost of drainage operations, that a slight difference in the outlay for the materials used does not seriously affect the entire expenditure. Works of this description occasion such disturbances of traffic, and are of such vital importance to the public health, that it is with justice remarked that only such materials should be used as promise the longest period of service without need of repair. Thus any partiality to local industry may lead to the most troublesome results in the end.

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ANCIENT MONUMENTS IN IRELAND.

DUBLIN ANTIQUARIAN SOCIETY.

At the monthly meeting of this society, held on the 12th inst., Mr. J. P. O'Byrne, who was received with loud applause, said that it was matter for great regret that the many noble monuments of antiquity which were strewn all over the land were fast mouldering away. The stranger to our shores would be led to believe that Irishmen were indifferent to the ancient glories of the past. Do not you meet the Druid's altar and the mystic round tower in every barony, and Ogham stones in many a sequestered spot? While every other nation in Europe jealously guards and studies the remains of what it once was, shall Ireland let all go to ruin? If Ireland were in national health her history and antiquities would be familiar by books and pictures, statuary and music, to every cabin and shop in the land; her resources as an agricultural, manufacturing, and trading people would be equally known. It is quite useless to ask the English Government to patronise the efforts we are making to save the ancient edifices of Ireland from the fast-mouldering hand of time. Nevertheless, it is the duty of all good governments to preserve the ancient remains of a country. No doubt a small sum was voted some years ago, which only went half way in patching up the thousand monuments which adorn our island. That venerable and celebrated relic,—the Coronation Stone of Destiny on Tara Hill,—stands in the open air unprotected, and is being constantly subjected to worse than Pagan usage. There was once civilisation in Ireland; and yet, with all our boasted nineteenth-century enlightenment, what do we know of Ireland or Irish history beyond a catalogue of names and a few marked events? He trusted the members of the Antiquarian Society all over the country would do all in their power to preserve the monuments of Ireland. And so say we.

FACING BRICKS.

BUILDING in brick has been resorted to in this country for a long time. Not so on the Continent, where brick has come into more extended use only in recent years. The taste for brickwork is spreading everywhere, not only in districts poor in quarry stone, but all over France, Germany, and Switzerland, where, even for buildings of some architectural importance, rough masonry work was the prevailing mode. In Switzerland especially, where the workmen have had little experience, building with brick is looked upon as expensive and luxurious. In consequence of the prevailing tendency of combining the beautiful with the useful, facing bricks of various sizes are now manufactured in Germany and Switzerland, by the employment of which builders are enabled to erect walls for nearly their whole thickness of bricks or cement slabs, even partially of quarry-stones,—which may be obtained everywhere at very low rates, especially now,—and to face them afterwards with a finer description of bricks. Bonding is preserved in the usual manner by joining the inner bricks in such a manner as to use for facing alternately ¼, ½, or ¾ bricks. This way has the advantage, besides cheapness, of permitting the facing bricks to be put in afterwards, so that they cannot be soiled or damaged.

The greater the distance of the building site is from the place of manufacture of the facing bricks the greater is the saving by a reduction of carriage, the charge for which is very high in Switzerland especially, and tells so much with heavy materials. The bricks are, therefore, made hollow, and, in order to secure a better hold for the mortar, provided at the sides with ribs and grooves. It is evident that, for the manufacture of facing bricks of the description indicated, only clay which in burning becomes hard and compact, and acquires a nice colour, is suitable. Bricks which are brittle, porous, of an inferior colour, are not adapted for elegant and durable building, are consequently lower in price, and will not bear increased expensive working. Architects who have visited recently Northern Germany, and in Southern Germany, especially Frankfurt and neighbourhood, will have seen numerous instances of the application of partial facing bricks. At Amsterdam, the new railway station is being built with those bricks. In Switzerland, as far as we know, those bricks have been used only in two instances, at Basel and at Geneva. In Switzerland, they are made in dark red, yellowish white, and various shades between those two colours. The bricks are said to be of very great hardness, and of close grain, carefully made, and well burnt. There can be no doubt that these facing bricks will find a more and more extended application.

THE SWISS NATIONAL EXHIBITION BUILDING AT ZURICH.

THE most remarkable feature at present noticeable in the construction of the above building is the Machinery Hall. A great part of the hall is now covered in, and its carpentry work is nearly complete. This hall (which is expected to be one of the most attractive portions of the exhibition) is composed of two wings which intersect each other at a right angle. One is about 420 ft. in length, and the other about 320 ft. The width is about 80 ft., and the height about 60 ft. There will be a gallery looking out upon the river Sihl. The transmission of steam power will be effected by means of an underground passage, so that visitors will not be in any way incommoded. The Machinery Hall will be, it is said, larger than any which has lately been seen at any district exhibition, and even compares with the similar portions of the recent national exhibitions.

In one spot an octagonal structure is being erected, surmounted by a tower, from the summit of which a view of the city and its romantic environs can be obtained, as well as a general idea of the exhibition building and its surroundings.

THE MUNICH INTERNATIONAL ELECTRICAL EXHIBITION.

THIS exhibition was opened on Saturday evening, the 16th inst., by Duke Charles Theodore of Bavaria (as representative of the king), in the presence of upwards of 1,000 guests.

Dr. Von Beetz, the president of the committee, opened the proceedings by referring to the comparatively modern period in which the science of electricity has attained the important position it to-day occupies amongst the various branches of human knowledge. He likewise alluded to the important advances lately made in the storage of electric force and in the application of electricity to various mechanical purposes. He remarked that the astonishment we now feel at the marvels of electric science is similar to that sentiment with which our forefathers regarded the invention of the steam engine, and its adaptation to purposes of locomotion. In conclusion, he referred to the international character of the exhibition and to the advantages which the cause of science would probably derive from the display of what various nations are now doing in this important branch of technical knowledge.

Duke Charles Theodore then declared the exhibition open.

DRINKING-FOUNTAIN AT ST. JUDE'S, WHITECHAPEL.

THE drinking-fountain which we illustrate this week, executed by Messrs. Doulton, from the design of Mr. Statham, was alluded to in our notice of the last Building Exhibition at the Agricultural Hall, where it formed the centre object of Messrs. Doulton's exhibits. It now stands in its place against the wall of the tower of St. Jude's Church, Commercial-street, Whitechapel.

The materials employed are the result of a desire to use something which would present an indestructible surface without the expenditure on mere raw material which would have been incurred by the use of granite, the material adopted by the Drinking-Fountain Association for their street fountains. Doulton ware presented such a material, with the opportunity of obtaining a certain amount of elaboration both in modelling and colour, at a cost less than that of the plainest and most uninteresting granite structure on the same scale. The steps are made of the Eureka Concrete Company's material.

The cost, including the steps, was 32*l.*, the whole being presented to the district by Mrs. Barnett, the wife of the Rev. S. A. Barnett, the Vicar of St. Jude's, as one means of contributing towards the ornamenting and improvement of the neighbourhood. The effort must certainly be considered successful.

HÔTEL DE VILLE, PARIS.

HALL OF FÊTES.

IN a recent volume we gave an external view of the Hôtel de Ville, Paris, as rebuilt under the direction of Messrs. Ballu & Deperthes, architects, with a very brief sketch of its history.* The view showed what is known as the Façade Boccador, from the name of the Italian architect who is believed to have designed it, and which is an exact reproduction of that part of the building as it existed before its destruction in the time of the Commune, 1871. The competition which resulted in the present building took place in 1873.

In July of the present year a portion of the interior of the Hôtel de Ville was opened on the occasion of a splendid fête; as we had previously shown, however, a large amount of work remained to be done to complete the interior.

In our present number we publish a view of the Hall of Fêtes, in which was given the inaugural banquet, and we shall be able on a future occasion to add some descriptive particulars.

DERBY SCHOOL: NEW MASTER'S HOUSE.

THIS building, which is now nearly finished, is being built in the Kedleston-road, adjoining the school cricket-field, and within a few minutes' walk of the school buildings. The facing bricks are red Coalville, and the tiles dark-coloured Broseley. The work is being well carried out by Mr. C. Bass, builder, of Leicester, for the sum of 1,500*l.* The architect is Mr. E. J. May, 3, Great James-street, London.

HOUSE ERECTED IN THE CLAPHAM-ROAD, LONDON.

IN our present number we give an illustration of a house which has been recently erected near Clapham Common for Mr. Hunter, organ-builder.

The house is built of bright-coloured stock and rubbed red brickwork, with a Portland stone balcony and cantilevers under; the gable of the house in the lower part is tile-hung, and the cove and upper part are finished in plaster work, carved and stamped by the architect. The roofs are covered with red tiles. The whole of the window-frames are shown outside, and have a moulding round where they meet the brickwork, the upper lights of windows above the transoms have lead glazing in, and all the woodwork throughout is painted white.

A pleasing feature has been introduced at the side of the house, where a window which lights the upper staircase is brought between the two chimney-stacks with an arch over.

A large organ-factory has been erected at the back of the house, from which it is separated by a court-yard, and the archway at the side is made so that carts can have access to it. There is a large show-room above the archway nearly the whole depth of the house in length.

In the interior there are some turned newels, balusters, and other woodwork, in old-fashioned style.

The chief aim in all the work has been to keep close to the homely English brick style, which prevailed in the last century.

The whole of the works were designed and superintended by Mr. Sidney R. J. Smith, A.R.I.B.A., Belle Vue House, Lansdowne-road, Clapham. Mr. Cope was the foreman who had charge of the work.

Electrical Cutting of Glass during Manufacture. — At present, large glass cylindrical vessels for scientific and commercial purposes are cut during manufacture by surrounding them with a thin filament drawn out from the molten glass, and then cooling them suddenly by contact with a cold substance. According to *Iron*, a more sure and perfect method has been devised by Herr Fahdt, of Dresden, who surrounds the glass vessel with a copper wire, connected by binding screws with the two poles of a galvanic battery, and made red-hot by forming contact. The rough edges are then rounded off by turning the object in a blow-pipe flame; and, to prevent any unequal contraction of the parts subjected to this action, a slight annealing is effected in the furnace.

* Vol. xxxix. (1880), p. 335, &c.

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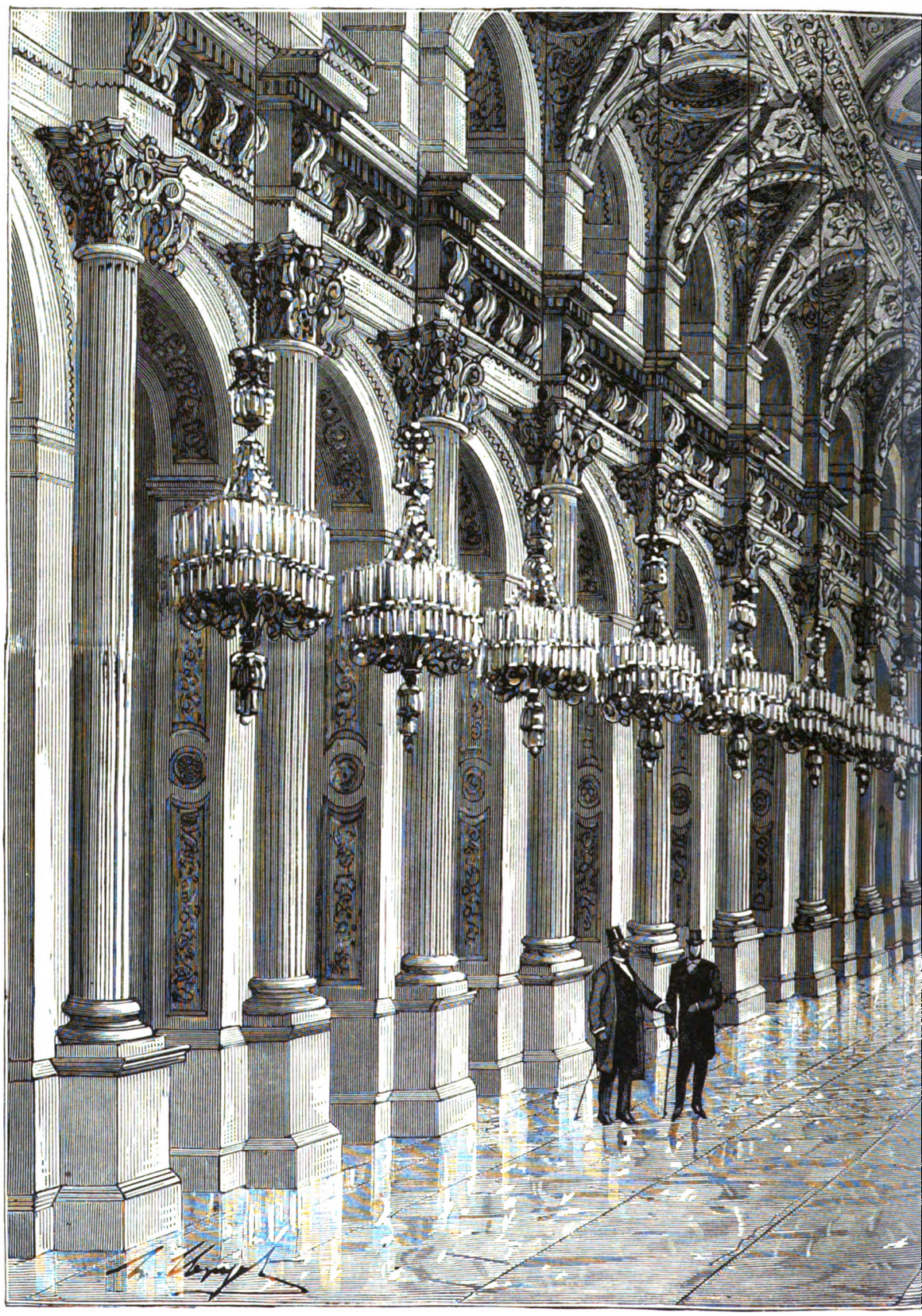

THE PARIS "HÔTEL DE VILLE": INTERIOR OF THE

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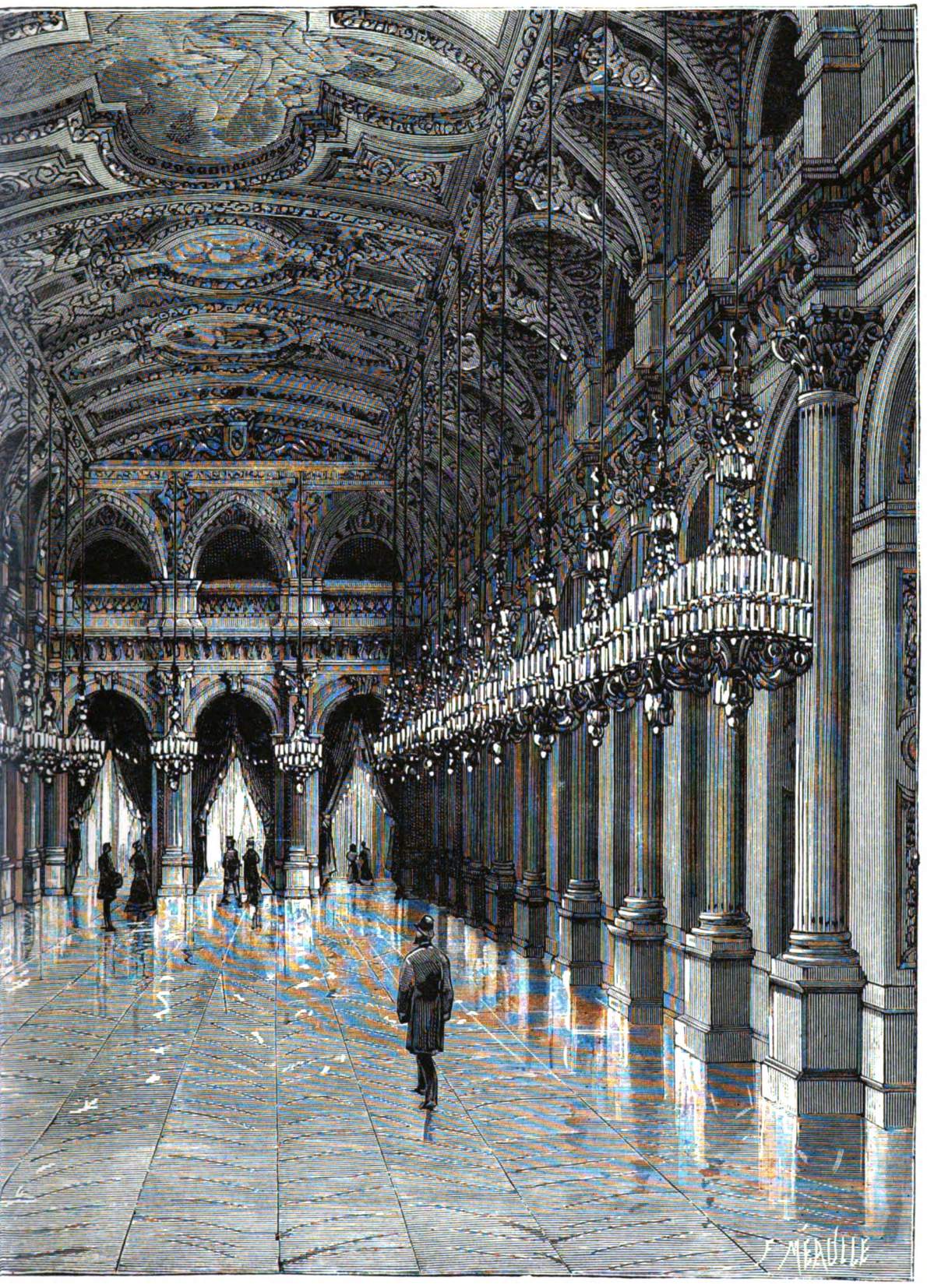

ESTAL HALL.—Messrs. Ballu & Deperthes, Architects.

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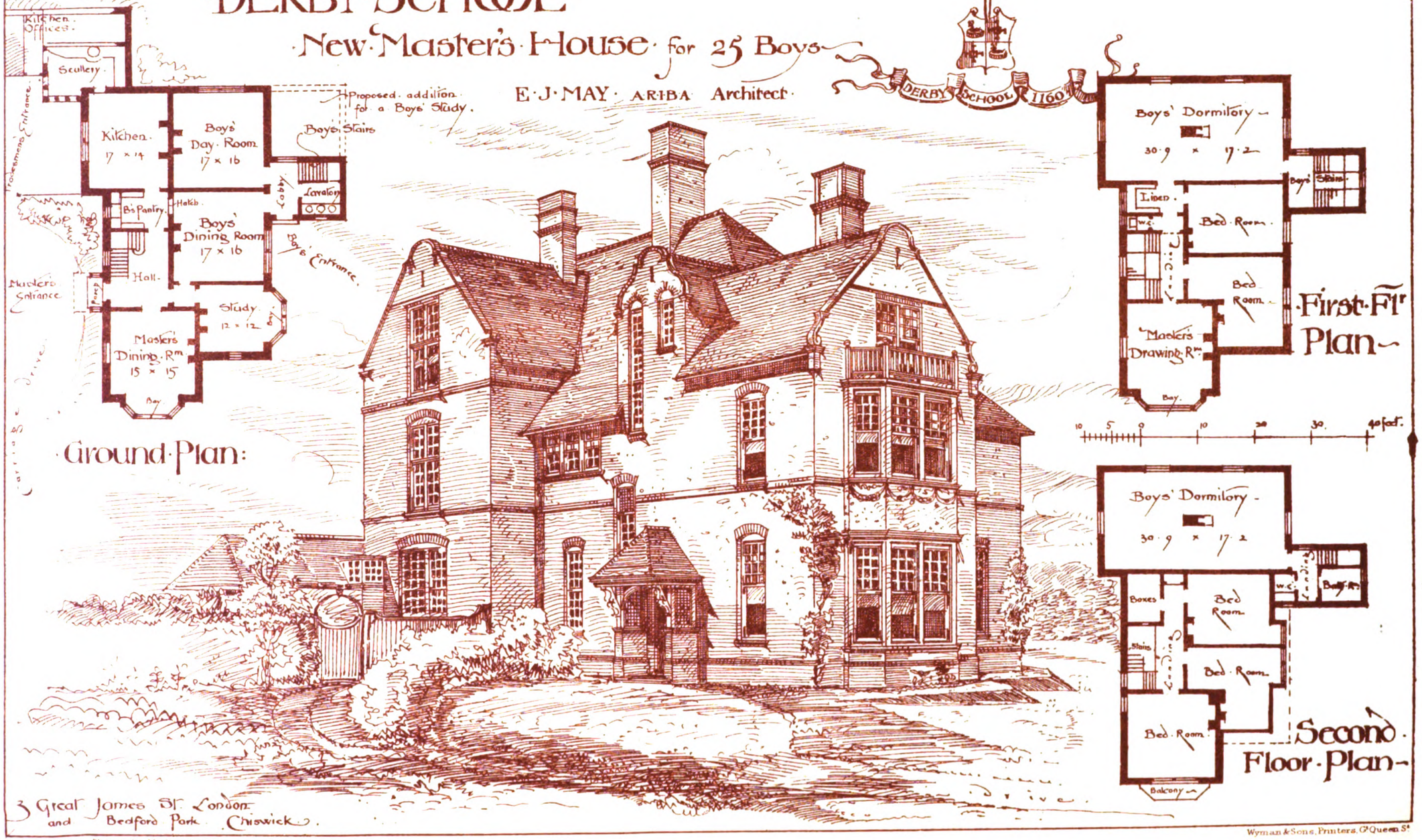
DERBY SCHOOL

New Master's House for 25 Boys

E. J. MAY, A.R.I.B.A. Architect.



3 Great James St. London and Bedford Park. Chiswick.

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Drinking Fountain of Doulton ware: erected at St Jude's Church Whitechapel: H.H. Statham Archt.

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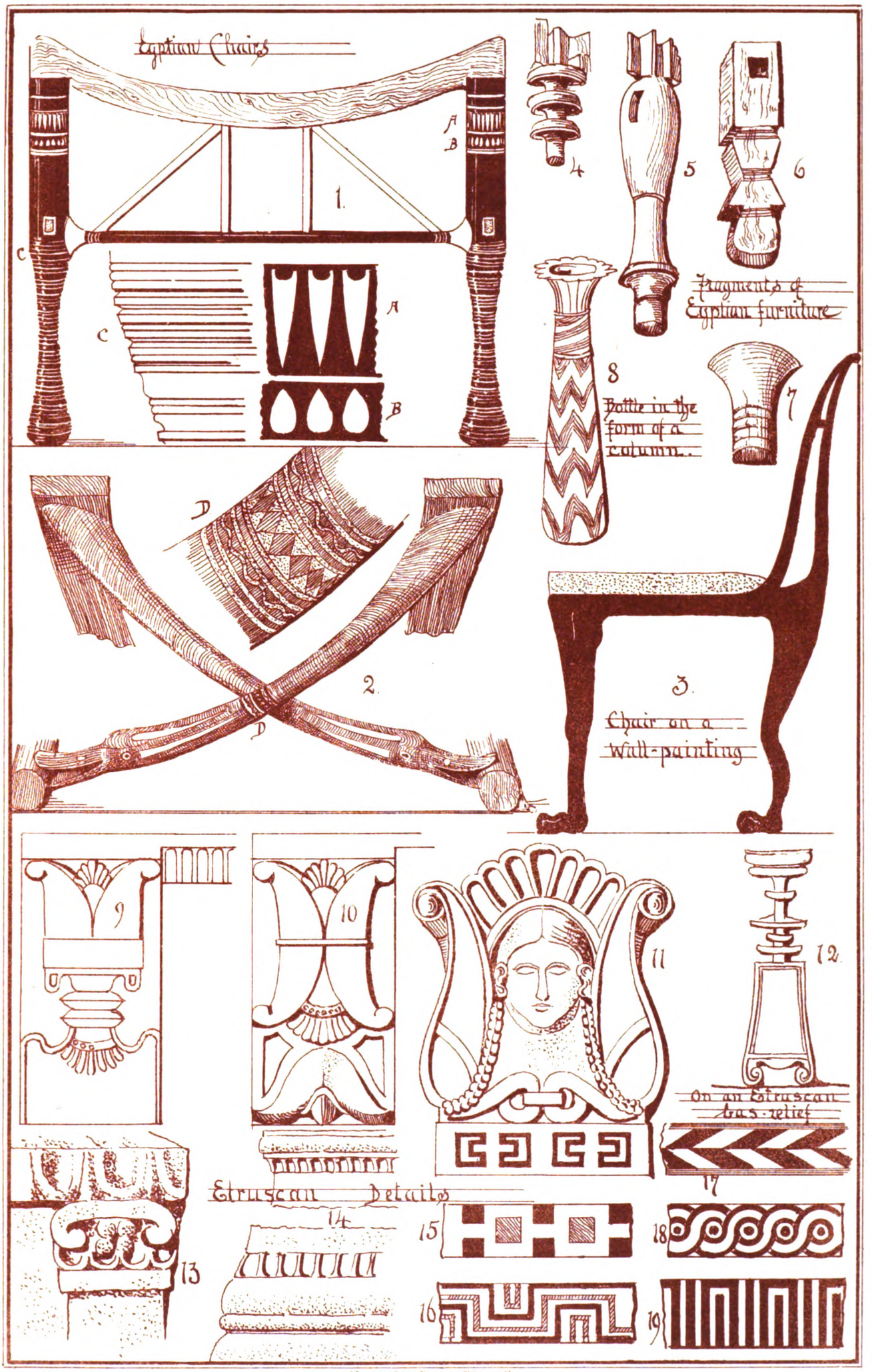

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ANCIENT ARCHITECTURAL AND FURNITURE DETAILS: BRITISH MUSEUM.

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HOUSE IN THE CLAPHAM ROAD, LONDON.—Mr. Sidney R. J. Smith, Architect.

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GLASGOW MUNICIPAL BUILDINGS.

SKETCH DESIGNS EXHIBITION.

SIR,—Upon the supposition that the rejected designs in the Glasgow Municipal Buildings Designs Competition were contract ones, and that there was no new light among them, your view that the exhibition of sketch designs was superfluous is, perhaps, correct enough. But there might have been new conceptions or new combinations displayed in them which were worth showing; and when architects have spent days in drawing and nights in dreaming over a plan, they are apt to imagine that there is something in their production of a promising kind, and to wish for an opportunity of exhibiting it to the town. Besides, are there no lessons to be drawn from such an exhibition,—no beauties to be discovered, no defects to be pointed out? There were many neat and ornamental designs exhibited. Were any of them,—it might be asked, for instance,—perfectly appropriate to the situation,—sufficient for the position and purposes of the building? One great thing to look to is that the building should cover the ground well, be elegantly spread upon the surface, with a sufficient number of handsome ins and outs on the plan. Another thing of moment is, that the façade should have that largeness of appearance which is not got when the picture of it fills the eye at once, or when it has the appearance of a small building erected upon a large scale. It seemed to me, on a cursory view, that some of the designs would suit an academy or normal seminary better than municipal buildings, so neat and self-contained were they. Some of them were as pretty as ivory tectotums, or a new-born cherub that had come into the world with its wig on.

A building of the kind required should be spacious and square, and be all glancing and gleaming like a battalion of soldiers at the "present" on a field-day. The grand is always above expectation, and when the building had its walls brought up to their height and level, and completed and finished with cornices and balustrade, and urns and statues, and all in keeping, that another tier should suddenly and gracefully spring up in bows and curves and arcs, with trellis and hood, and filigree and stars and stripes; and that the work of splendour should begin at the very point where it appeared to be at an end, would please the eye and the imagination; then, that over and above that, and in the background, the spires and domes, and minarets and peaks and pinnacles, should rise, and pierce, and flash in blue sky, and all in due proportion, would satisfy the severest taste.

There is no such view as that perspective one required in the competition by the assessors to be got in the case of most large and imposing buildings. Nor could such a view of the building in question, when erected, be obtained. The flanks of mostly all large buildings in towns rest in perspective on the smaller and obscurer buildings which surround them, and in the country on banks and groups of trees: and properly so. Whether the building when completed will shoulder it finely in the town remains to be seen. But with regard to the putting the competition-sketches out of sight, I do not see that there is any obligation to do that, or that it should be expected to be done. If these designs, or any of them, or one of them, have anything original in their composition, there is no cause that they should merely strut and fret their little hour upon the stage, and then be seen no more. On the contrary, this is rather a case when being beaten in one city the disciple should shake the dust off his feet and flee to another. As a personal matter, my own design (by the way, the town from which it hails is not mentioned among others in the *Builder*), furbished up, may yet appeal to lovers of art in London or in Paris. As it is, I have the consolation that it was approved in Edinburgh. An architect of great experience and very considerable taste told me that "the roof was well broken up, and that the front would have a grand appearance." And on the strength of this I have gone on and will go on.

W. Y. B.

*** We had no intention in the note referred to by our correspondent to express any objection to the *exhibition* of the sketch designs; our objection was simply to any reopening of the first competition by *review* of the sketch designs which had been put aside. Exhibition is at all times desirable so that the greatest educational advantage possible may be obtained from a competition, and that all desirable publicity may be given to the merits of competitors. We add what appears to be at present scarcely a list of the authors of the ten designs selected from the first open competition:—

"Viola," Mr. Young, London.
"St. Ronan," Messrs. Hall & Taylor, London.
"Semplice," Mr. Lynn, Belfast.
"Gauntlet," Messrs. Worthington & Elwood, Manchester.
"Ars Regina," Messrs. Leeming & Leeming, Halifax.
"Aurea Mediocritas," Mr. G. S. Aitken, Dundee.
"Civis," Mr. F. T. Baggallay, London.
"Peradventure," Mr. F. Stirrat, Glasgow.
"Ite," Mr. Higgins, Glasgow.
"Trident," Messrs. Coe & Robinson, London.

CARPENTRY AT CROYDON.

LAST week a meeting was held at the Public Hall, Croydon, for the purpose of distributing the prizes and certificates to those members of the Croydon Technical Carpentry Class who had been successful at the examination recently held. Dr. Alfred Carpenter, J.P., presided, and in opening the proceedings said that perhaps there was no place which more showed the necessity of technical training in carpentry than Croydon. During the past year, according to the report of the Local Board of Health, more than 1,200 new buildings had been erected, and he was sure that any one who had noticed houses in course of erection in Croydon would admit that in their construction there was shown a great want of knowledge on the part of the carpenter. At present there was a great difficulty in regard to carpentry, in consequence of the action of the contractors, who did not seem to care how the work was done so long as it was done cheaply. The system of apprenticeship was dying out; contractors did not care to teach apprentices. The carpentry classes supplied the deficiency thus created. Any one attending these classes, too, would be able, when necessary, to turn his attention to other kinds of work to that on which he might be specially employed. They, in fact, would become good workmen, and do their work at less cost to the masters and greater benefit to themselves; for they would be able to do it in a smaller amount of time.

The Rev. Henry Solly, the founder of the classes, read a letter from the Drapers' Company, regretting that they were unable, through absence of members of the Court from London, to send a deputation to the meeting. Mr. Solly then delivered an address, showing, by many practical illustrations, the great advantages of a technical education generally, and particularly as regards carpentry.

Mr. C. T. Millis, hon. secretary of the Artisans' Association for the Promotion of Technical Education, also addressed the meeting. He urged that in addition to the practical value of technical education in making men better workmen, it had another, a moral, value in causing men to think, and so making them better men. Particularly he advised a thorough knowledge of practical geometry, and said he believed that men would find it to their advantage to join these classes even if they had to "lose a quarter" to do it. In Mr. Staynes they had an excellent teacher, possessing just the kind of knowledge required to teach such a class.

Mr. Staynes, the teacher of the class, in his report, said the class had increased from sixteen to thirty-six during the last two years, and that the members attended more regularly than last year. He strongly recommended all carpenters to learn the elementary principles of solid geometry. It would enable them to do their work more quickly and accurately, as it acted as a check against error.

Mr. Fraser, artistic carpenter and designer of art furniture, and a donor of one of the prizes, bore testimony to the superiority of the workmen under him who had attended the technical carpentry class over those who had had no such training.

Dr. Carpenter then distributed the prizes and certificates as follows:—Mr. A. D. Reynolds, first-class certificate with prize for practical plane and solid geometry (elementary stage); first-class certificate with prize in the elementary stage technical carpentry; also first prize for home work. Mr. F. Shopland, first-class certificate with first prize, elementary stage technical carpentry; second prize for home work. Mr. J. E. Mead, first-class certificate with prize, elementary stage technical carpentry. Mr. Winpenny, second-class certificate, advanced stage technical carpentry; first prize for applied work. Mr. Hayward, third-class certificate, advanced stage technical carpentry; second prize for applied work. Mr. S. Hughes, third-class certificate, elementary stage, technical carpentry; prize for an extra paper.

Mr. Knight (furniture manufacturer) proposed, and Mr. Bailey (builder) seconded, a vote of thanks to the Drapers' Company for the pecuniary assistance they had given to the class. The resolution was carried with applause.

THE TRADE UNIONS CONGRESS IN MANCHESTER.

THE fifteenth annual congress of trade unionists was opened in the Co-operative Hall, Ardwick, Manchester, on Monday last. The following were among the societies represented by delegates, viz., the Operative Bricklayers' Society, Carpenters and Joiners of England and Scotland, Amalgamated Society of Engineers, Operative Stonemasons of England and Wales, United Operative Masons' Association of Scotland, Amalgamated House Decorators and Painters, Manchester Operative House Painters' Association, Metropolitan Society of Operative Painters.

Mr. T. Birtwistle, chairman of the Parliamentary Committee, took the chair, and in introducing the business of the congress, he expressed a hope that the deliberations of the delegates might not only tend to the improvement of the moral and social condition of the working class, but strengthen and promote the true principles of trade-unionism.

Mr. Robert Austin, Amalgamated Engineers, Manchester, was elected president of the Congress; Mr. John Burnett, London, treasurer; Mr. Kelly, Manchester, secretary; Mr. J. R. Smith, London, vice-president; and Mr. Shorrocks, Manchester, and Mr. Sedgwick, Leicester, auditors.

On the motion of Mr. Shipton, a resolution was passed recording the appreciation of the congress of the valuable work rendered to the cause of trade-unionism by Mr. Daniel Guile, and their best wishes for his long and happy life in retirement from his official duties as secretary to the National Society of Ironfounders.

The Parliamentary Committee's report was read by Mr. Broadhurst, M.P. It began with a tribute of respect to the memory of Mr. A. Macdonald, M.P., and the next subject noticed was the Employers' Liability Act Amendment Bill, with which no progress had been made during the past session. "In the meantime," it was added, "many families are suffering injustice by the sharp practice of some employers, who, when an accident befalls a workman in their employ, have, by paying the injured person his full wages for six weeks thereby induced him not to begin an action at law within that time. Payment is then discontinued, and the injured person has lost his right to sue for damages, as the notice required by the Act has not been given. The energy of insurance companies, in their endeavours to induce men to contract themselves out of the Act, has considerably increased during the year. We have had occasion to notice the plausible proposals of an insurance company who are establishing, in connexion with their general business, an 'accident fund,' to which employers and workmen mutually contribute. For a small weekly payment by the workpeople and the employers, they propose certain benefits in cases of accidents for which the employer is not liable under the Act; but it is to be known that the employer is 'not liable under the Act' for all cases insured without the decision of a Court. We are at a loss to understand this, and we hope that the workpeople will not be caught contracting themselves out of the Act by this specious mode of putting the case. Our advice to workmen is that they should hold fast to the law. If they want greater insurance against sickness and accidents, let them join the unions established for that purpose and managed by their fellow workmen. For injuries received through the neglect of their employers they should claim compensation under the law given by Parliament for that purpose, but we cannot advise them to throw in their lot with companies of which they know little or nothing, and thus barter away the rights and protection which have cost us so much to obtain. During the past session Mr. Burt and your secretary succeeded in striking out of the Huddersfield Corporation Bill a clause having for its object the contracting out of the Act of

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the *employés* of that Corporation. A return moved for by Mr. Norwood, intituled 'County Courts Plaints,' shows that during the year 1881, 126 causes under the Employers' Liability Act were entered in County Courts. Twenty-two of these resulted in the recovery of damages to the amount of 1,533*l.* 18s. 6d., being an average of 69*l.* 14s. 6d. in each case. Six had yet to be tried in 1882, and twenty-two had been withdrawn and settled out of court. In the remaining cases either the juries could not agree or the result was a verdict for the defendants or a nonsuit. We have no doubt that during the current year the number of cases will show a great increase over that of 1881, and will further demonstrate the great advantages, notwithstanding its shortcomings, derived by the working classes from the Act of 1880. We have no doubt that during the next Session of Parliament Mr. Burt will do his utmost to press forward the Amendment Bill. In this difficult task he is entitled to, and will, we trust, receive, the energetic assistance of those whom it is intended to benefit.

"The general trade of the country has not been so brisk during the past year as we could have wished. Exception to this general quietness must, however, be taken in the case of the engineering and iron shipbuilding trades. In these branches we believe that the demand for labour is fairly good. In the iron shipbuilding trade it has never been equalled, and, as far as union purposes are concerned, the men appear to be laying by for the proverbial rainy day. We hope they are also as thrifty in their private stores, as it is impossible for so extraordinary a period of prosperity to continue, and nothing would more surely steady the inevitable fall in wages than for each workman to be in a position to warehouse his labour, if we may use the term, in times of threatened reductions consequent on scarcity of employment."

The President, Mr. Austin, delivered his inaugural address on Tuesday. Commencing by giving a retrospective glance at the history of this annual congress, he said he found that during the fifteen years of its existence there was much trade unionists might pride themselves upon. Their position at the present time was far different from what it was fifteen years ago. Their funds were protected now by registration, and the Criminal Law Amendment Act had repealed the Master and Servant and the Conspiracy Acts. The Mines and also the Factory Acts had been amended, and the Employers' Liability Act had been passed. This last Act would come before them for amendment, in consequence of the evasions of some of the employers, and the decisions of the lawyers. When the second congress meeting was held in Birmingham in 1869, there were present 44 representatives of trade unions and trade councils, the number of members they represented at that time being, he judged, about 150,000. At the present meeting there were upwards of 150 delegates, representing more than 500,000 members, being an increase of 300 per cent. in representatives, and the same number in members,—a very satisfactory result. He trusted that before the congress had been twenty-one years in existence the members represented would reach the number of 1,000,000. At the time when the first congress was held the trade unionists and trade unions were undergoing the ordeal of examination by Royal Commission, and if they did not come out of the searching inquiry exactly like gold out of the hands of the refiner, they came out of it in such a manner as to show that trade unionists were not so bad as they were painted, but were very much like other people. In connexion with the repeal of some of the unjust and unequal laws of past days, croakers had prophesied that injury would accrue to persons of property. They had, however, never heard at all of such injurious results since the repeal of the laws which trade unionists at one time suffered under. Trade unionists simply asked for fair treatment. They were and always had been law-abiding citizens, prepared to follow out those dictates of common sense and reason which should guide every man and woman. A great deal yet remained to be done, and he trusted that by their united efforts they would go persistently on and never rest contented until they had placed on the statute-books of Great Britain and Ireland the whole of the seventeen propositions on the programme for consideration at that meeting. The first proposition was one relating to the amendment of the Employers' Liability Act, 1880. It was not necessary for him to tell them what the Act referred to, or what was its intended operation. Suffice it to say that every conceivable advantage had been taken of the defects in the Act by unprincipled employers and large companies, so as to render the Act practically of no use. It was for the congress to say whether they would rest satisfied with that state of things or not. In fact, those who were entrusted with the administration of the law had in many cases been hostile to the claimants, who were mostly helpless in the matter. The amendment of the Act deserved their most earnest and serious consideration. They must do all that they possibly could by every legal means in their power to induce their representatives in Parliament to vote that this law should become what it was intended to be, namely, a real benefit to men injured through the negligence of their employers. They asked for the same conditions for the working man as were granted to the general public. He found from the last report of the Employers' Association that it was stated that so far as the Iron Trade Employers' Association of Great Britain and Ireland was concerned, that Act had not brought that ruin to many which had been predicted, and they found that they could meet all their liabilities for a sum of 330 per cent. less than the sum at which the insurance companies had agreed to contract them out of their liabilities. There was evidence which proved that more care was now exercised than was the case before, and that the insurance companies' calculation for taking the risk were based upon the evidence of the past.

Among the other topics touched on by Mr. Austin in his address were factory inspection, the prevention of steam boiler explosions, and the patent laws.

THE DEMOLITION OF KENSINGTON HOUSE.

THE final sale of the materials of Kensington House, preparatory to the erection of new buildings on the site, took place on Monday and Tuesday last, when the carcass of the building, together with the massive ironwork, consisting of numerous box-girders and columns, also the flooring-boards and joists, the whole comprising nearly 300 lots, was sold. Included in the sale was also the west half of the grand marble staircase, the whole of which was purchased at the June sale, by Madame Tussaud & Sons, for 1,000 guineas, with the intention of introducing it into their new building now in course of erection in Baker-street. It now appears that the staircase in its entirety will not be required for the new premises, and hence the resale, which produced 480*l.*, or nearly 50*l.* less than the moiety of the staircase was sold for in June last. Six pairs of Italian marble fluted Corinthian columns, which were likewise disposed of at the June sale for 100*l.* per pair, were now again sold, realising 74*l.* per pair. The total sum realised by the stone and brickwork of the main building was 760*l.*, the portico over the principal entrance, supported on six polished Aberdeen granite columns, and two polished pilasters, being sold for 140*l.* The total proceeds of the two days' sale amounted to 2,389*l.*; but, in estimating the sum which the whole of the materials and fittings of the building have ultimately realised, 924*l.* must be deducted, the amount produced by the second sale of a portion of the staircase and the marble columns, leaving the net produce of Monday and Tuesday's sale at 1,465*l.* This, added to 8,450*l.*, the result of the four days' sale in June last, brings up the aggregate produce of the sale of the materials of the building to 9,915*l.*, its original cost having been variously put down at 180,000*l.*

Workmen are now busily engaged in constructing the sewerage on the estate, preparatory to the commencement of building. Mr. Mears, of Hammersmith, is the contractor for this portion of the work.

A New Industry for Middlesbrough—On the 5th inst., at a meeting of the Streets Committee of the Middlesbrough Corporation, plans were submitted and passed for the erection of new works on the Marshes at Middlesbrough, for the manufacture of Scotch and Ganister firebricks by the Middlesbrough Firebrick Company. It is expected the works will give employment to between 50 and 100 hands.

FALL OF A BUTTRESS AT ST. PATRICK'S CATHEDRAL, DUBLIN.

ON Thursday, the 14th inst., shortly after noon, one of the buttresses on the north side of the chancel of St. Patrick's Cathedral, Dublin, fell to the ground with a terrific crash, the force of which smashed the fallen masonry into a great heap of *débris*. The adjoining portions of the building were considerably damaged. We regret to say that the catastrophe involved the death of three persons,—a young girl and two boys.

The buttress which fell so suddenly was nearly 70 ft. high. It and three other buttresses supported the north wall, which runs alongside Patrick's Close, a wide thoroughfare, occupied almost entirely on the side opposite the cathedral by small shops for the sale of second-hand furniture and articles of a very miscellaneous description. The side of the street nearest to the cathedral has no houses erected upon it, and beyond the narrow footway are the iron boundary railings of the cathedral grounds. Inside these railings on the north side the grounds are not wide,—probably about 15 ft. or 20 ft. from the railings to the bases of the buttresses. These were built of solid masonry, each being topped by a heavy pinnacle in cut stone, weighing many tons. The buttress which fell spread across the entire space between its base and the opposite shops.

The *Freeman's Journal* says the cathedral is built upon the lowest ground in the city, and almost since its partial re-erection after fire in the latter part of the fourteenth century its base was subject to the disastrous effects of water lodging around the foundations. The Poddle River, which runs beneath the building, is the cause of this lodgment of water, and frequently causes an inundation of the grounds. The excessive damp which, spite of all efforts, could not be overcome, made it absolutely necessary that steps should be taken to strengthen and preserve the foundations, and at the beginning of last June the cathedral was closed and placed in the hands of contractors for the execution of the necessary improvements. Messrs. Dockrell, Sons, Martin, & Co., undertook a contract for the laying down of encaustic tiles throughout the floor, and Mr. Stephen Adams, of Bishop-street, undertook excavations for the purpose of laying down suitable heating apparatus. His contract was completed last month. Mr. J. H. Pile, of Great Brunswick-street and Abbey-street was entrusted with the contract for underpinning and concreting the endangered foundation. A moat had been dug along the north wall. The excavations were carried to a depth of a few feet below the base of the foundations. Mr. Pile's workmen, it is said, commenced underpinning the first of the buttresses a few days ago. On the day preceding the accident, this buttress, they state, gave indications of not being safe, and on the morning of the accident, five or six of Mr. Pile's workmen applied props to the foundation, and then proceeded as expeditiously as possible with their concrete work. Shortly after twelve o'clock, the men being in the excavated moat, their attention was attracted by a trembling motion in the buttress, and seeing, when they looked upwards, the nature of the occurrence that was about to take place, they jumped out of the moat, with a shout of alarm, and rushed into the graveyard. The next moment supplied ample proof that their escape from death was narrow and providential. Down fell the buttress with a dreadful crash. The base of the masonry sank into the excavation underneath, but the main portion of the column, without perceptibly losing any of its solidity until the crash occurred, spread across the graveyard and the street. A section of the iron railings was smashed, and the dwarf wall dislocated by the tremendous force of the falling stonework. Two enormous masses of stonework and mortar lay in the centre of the street. The topmost part of the pinnacle fell upon the roof of a one-story house on the opposite side of the Close and burst through it into the yard at the rear, fortunately without injury to any person. Near this house the heavy entrance-gate of a yard was smashed by other portions of the descending pinnacle. Here two children who had rushed to the shelter of the archway lost their lives, their bodies being almost crushed into pulp; and a girl named Sarah Egan, in whose arms was a child two years old, was also knocked down and died a short time afterwards

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from her injuries. The infant was not killed, but received very serious injuries,—a fracture of the skull and several bruises on the body. An arch, shaped like an ellipse, which spread from the buttress to the north wall of the building, fell almost simultaneously with the buttress, and crashed through the slated roof beneath, but the groined arching below the roof proved sufficiently strong to sustain the weight of the *débris*, and thus saved the grand organ.

Soon after the accident, Mr. Park Neville, City Engineer, made a careful inspection of the foundation of the fallen buttress and of the foundations of the buttresses adjoining, as some apprehensions were expressed lest the calamity should be repeated. The foundations of the whole of the northern flank walls of the cathedral are exposed in the excavations which are being made with a view to carrying out necessary improvements in the drainage of the building. Mr. Neville expressed an opinion that it would be well to put up supports to the buttress next to that which has fallen.

On the 15th inst. Dr. Whyte, the Dublin City Coroner, held an inquest at the Morgue on the bodies of the deceased. Evidence of identification having been given,

William Egan, 17, Patrick-street, was examined. He said,—the deceased, Sarah Egan, was my sister. She was a servant-maid, and her age was 16. She last resided at 76, Patrick-street, in Mr. Mooney's house. I was one of the workmen employed in the building, and was engaged at the time baling out water.

The Coroner.—Can you say anything of your own knowledge as to how the accident occurred? That morning before the accident, just after breakfast, I took notice of a small crack in the building. I was working about 16 ft. down from the pathway.

Michael Goggins, 29, New Bride-street, examined.—I was employed as foreman mason of the works,—the repairing of St. Patrick's Cathedral. I was there when a portion of the building fell. I was standing quite convenient to it, on the bank formed by the earth thrown up.

The Coroner.—What first attracted your attention?—I first saw one of the pinnacles separate from the wall.

Was there any noise or warning?—I heard none. It came out quite clean from the wall.

Did it fall in a solid mass?—Yes; across the Cathedral-yard into St. Patrick's-close. At the time two masons were underpinning the buttress, and two labourers were bringing them stones; they had just time to get away.

They were actually engaged working when the masonry began to give way?—Yes.

What was it gave the warning?—A little bit of mortar fell down when the masonry began to give way, and alarmed them, and then they ran. The buttress stood out quite straight after parting from the wall, a minute or so before it fell.

Are you satisfied that all your men escaped?—Yes, I am; there are none missing.

When did the work commence?—My work commenced about three weeks ago. The greater part of the excavation around the cathedral was then completed. I had to superintend the excavations at the place where the accident occurred.

Do you know what those excavations were for?—Yes. They were being done to build a boiler-house to supply hot water to heat the church. I had completed the excavations at the spot.

Had all the buttresses undergone the process of underpinning?—No; only one.

Which one was that?—The one next to the one that fell had been partially underpinned.

How much of the underpinning had you completed of the one that fell?—The whole of it.

Then it was no safeguard in doing it?—No, sir, it was not. There was no connexion between the buttress and the wall of the church at all.

A Juror.—There was no tie?—No tie.

The Coroner.—That was a defect in the original construction?—Yes.

It was the excavation that brought about the catastrophe?—That is my opinion.

If the buttress had been properly constructed the excavation would not have had that effect?—No, sir.

Were you notified that morning that there was a crack in the buttress?—I was, sir.

And you saw it?—I did, sir.

What did you do to meet that?—I did not think the crack would be any harm, sir.

Supposing you did, could you have done any more?—Nothing more than that we might try to stop it up if we could.

Did the foundation of the buttress settle in any way?—No; not an inch.

Nor of the building?—No, sir.

Mr. Law.—The buttress projects from the church wall?—About 7 ft., sir.

What is the breadth of it?—About 4 ft.

When you were underpinning that did you go in under the whole of it?—No, sir. I began at one side, and went a foot under the mason work, and then built up from the bottom.

Did you cut away any mason work that was not sound or good?—I did, sir.

Did you pin it up in a proper mason-like way?—As well as it could be done by the hands of man.

How much of the work had you done when it fell?—I had the face and the third side.

As regards the buttress, is it a rough or a smooth wall? Does it appear as if there had been an older buttress there?—Yes.

Could you when you went there see a crack between the buttress and the main wall?—No.

And there has been some "facing" down there?—Yes.

Now at what point did the buttress break off? Is it at the juncture of your work?—At the juncture of my work and the old, about 4 ft. above where I was working.

The part that is still up against the wall, is that much above where you were working?—About 3 ft. or 4 ft.

A Juror.—Did you shore up any of this place?—Yes, I did. I thought the buttress was constructed in the ordinary way, and was properly tied. It never occurred to me that it was not tied.

After some further evidence, the inquest was adjourned until the 21st inst.

THE LONDON AND NORTH-WESTERN COMPANY'S NEW HOTEL AT PRESTON.

THE magnificent new hotel erected on the high ground, and the cresting of the Wenham Park, at Preston, by the London and North-Western Railway Company, has just been completed and opened. A view of the building, together with a general architectural description, has already appeared in the *Builder*. It is in the Renaissance style, of red brick, with red sandstone dressings, and covered in with red Staffordshire tiles. The most prominent feature of the building is a lofty tower, at the top of which is a tank, capable of holding 2,000 gallons of water, from which the hotel will obtain its supply for domestic and sanitary purposes. Below is a spacious apartment for the use of visitors, who are here afforded a most extensive and charming view of the valley of the Ribble and the surrounding country. The hotel is approached from the island platform of the railway station by a covered way, having an open-timbered roof the entire length. That portion crossing the line has a wooden floor, and is lighted on either side by plain white glass. This section ends in a spacious hall, from which the way is continued to the hotel. This portion of the structure has a striking and handsome appearance. The floor is covered with artistic octagon tiles, having an ornamental border, and the windows are glazed with tinted cathedral glass. The covered way has a total length of 180 ft. It is intersected by a 24 ft. cab-way at the back of the hotel, after crossing which it leads into the principal vestibule of the main building, which is paved with Minton's tiles, and is well lighted by an ornamental lantern light. This leads into the large hall, where the bar is situate. From this point run a series of corridors, ornamentally tiled. To the front of the building, facing the Park and the country around the valley of the Ribble beyond, are coffee-rooms, sitting-rooms, smoking-rooms, drawing-rooms, and private suites of apartments, whilst on the opposite side of the corridor are a number of bedrooms. The walls of the corridors and upper floors are lined to a height of 4 ft. with different coloured tiles, forming artistic panels. Above the tiles the walls are faced with the material known as "Lincrusta Walton." It is of a pale green colour, having a pretty embossed surface, and has a highly ornamental appearance. A wide stone staircase leads to the upper floors, on which are suites of apartments, and a number of separate sitting-rooms and bedrooms. Some of the suites are arranged for entire families, and comprise sitting-room, two bedrooms, dressing-rooms, bath-room, and lavatory. Every part of the building is well lighted and ventilated, the ventilating, heating, and sanitary arrangements having been carried out by the Sanitary Engineering Company, of Victoria-street, Westminster. In front of the hotel is a promenade, 400 ft. long and 18 ft. wide, and below this is a new public promenade, and the hotel is connected with the sloping park beneath, to which visitors have direct access. The grounds belonging to the hotel are being tastefully laid out as a garden.

The general contractors for the hotel, of which Mr. Mitchell, of Manchester, is the architect, are Messrs. Neill & Sons, of Manchester; and Messrs. Benham & Co., of London, have supplied the furniture. The total cost of the hotel and furnishing is estimated at 50,000*l*.

COMPETITIONS.

North-Eastern Counties' School, Barnard Castle.—At a meeting of the Governors of the North-Eastern Counties' School, held at Durham, it was resolved that the school be erected on land near the Bowes Museum, on the east, and Mr. Watson, Canon Brown, and Mr. Richardson were empowered finally to purchase or exchange land necessary for a square enclosure twenty acres in extent. A long discussion took place with regard to the employment of architects, and the proposition to throw the design open to public competition was negatived, as were also motions to limit the number to six, and even one. Several names were mentioned, and eventually it was resolved that three architects only be invited to compete, and were thereupon balloted for, namely, Messrs. Giles & Gough, London; Mr. Armfield, Whitby; and Mr. Johnson, of Newcastle-on-Tyne. It is hoped that the foundation-stone of the school will be laid on Lady Day next. The successful architect will receive no premium, his remuneration being the usual percentage on the cost of the building. The two unsuccessful architects will be awarded 40*l*. each. A writer in the *Darlington and Stockton Times* criticises the limitation of the number of competing architects to three, observing that two of the three gentlemen nominated to compete are diocesan architects.

MASTERS AND MEN IN THE BUILDING TRADE.

SIR,—The public will think, when reading Mr. Potter's letter in the *Times*, that there are at this moment, or likely to be, severe differences between the employers and employed in the building trade. It may, perhaps, be a relief to some to hear that we have never dwelt more peaceably together than now, and, as far as we can see, there is no prospect of a rupture.

It is quite true that a National Association of Master Builders does exist. It is also a fact that it was constituted soon after the last great masons' strike. Its object is to protect the masters against unjust demands from the men, either as to increase of wages or, what is often almost as important, "rules of working." This object, if faithfully carried out, is to the general benefit of the community. Since the establishment of this association there has been no serious general strike in the building trade.

It may be that it is unfortunate that such a society should be necessary, but in the case of a builder, where any one of the many trades employed may, by means of a strike, stop the whole proceeding of a building, it is impossible, with any degree of comfort, and without great risk, to carry on business without such means of protection, to be used in case of necessity. It so happens that, for some years past, labour in all branches has been abundant, and if the public were aware of the circumstances of the trade they would be inclined, I think, to commend the master builders for not having endeavoured to reduce the wages, as they might have made an attempt with good chance of success. But they have taken no step in that direction. I trust that the good feeling now obtaining in the trade may not be disturbed.

A BUILDER.

"Heaton, Butler, & Bayne."—In consequence of the death of their senior partner, Mr. Clement Heaton, his son, Mr. Clement John Heaton, who has for some time taken an active part in the business, has been taken into the firm.

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BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

4,287. S. C. Jervoise, Torquay. Open fire-grates. Sept. 8, 1882.

4,315. M. J. O'Riordan, Cork. Boilers for heating water and cooking, &c. Sept. 11, 1882.

4,353. H. Pearce, London. Apparatus for opening and closing fan-lights, casements, sashes, &c. Sept. 13, 1882.

4,369. W. A. MacLeod, Birkenhead. Window-sash-fasteners. Sept. 14, 1882.

4,383. F. Bander, Venezuela. Construction of walls, &c. Sept. 14, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named :—

September 12, 1882.

3,783. B. D. Healey, Brighouse. Asphalte apparatus. Aug. 9, 1882.

September 15, 1882.

2,266. W. Newell, Birmingham. Combined letter-box and name-plates. May 13, 1882.

ABRIDGMENTS OF SPECIFICATIONS.

Published during the Week ending Sept. 16, 1882.

326. O. Seefels, London. Stamped metal roof tiling. (Com. by H. Klehe, Baden-Baden). Jan. 23, 1882. Price 4d.

This tiling is made of sheet metal, stamped out with a curved lip, whereby each plate overlaps the next. (*Pro. Pro.*)

519. G. W. von Nawrocki, Berlin. Fire-places. (Com. by R. Müller, Berlin.) Feb. 2, 1882. Price 2d.

Above the grate is placed an iron box, round which are flues, the air passing through which is heated, and mingles with and thus consumes the smoke. (*Pro. Pro.*)

556. E. Verity, J. M. Verity, and B. Banks, Leeds. Windows. Feb. 4, 1882. Price 6d.

The sashes are made with double frames. The outer one slides in the ordinary grooves in the window-frame, and the inner one, which carries the glass, is hinged to the outer frame. They are secured together by a cam action.

558. G. W. Wigner, London. Gas-fires. Feb. 4, 1882. Price 2d.

The pipe which constitutes the burner is fitted to the shape of the grate, and one end is plugged, while the other projects beyond the grate, and when the gas is lighted draws hot air into the interior of the grate. The bottom of the grate is covered with sheet metal, and the back is filled with a mixture of clay, saw-dust, and water, with silicate of soda. (*Pro. Pro.*)

566. T. Redmayne, Sheffield. Fire-places. Feb. 6, 1882. Price 4d.

The front bars are suspended upon a transverse bar, and the bottom bars are arranged to rise or fall as required. When the fire requires replenishing the front bars are turned inwards, so as to lift the coal off the bottom bars, which are then allowed to fall and fresh coal is put in, when the bars are replaced.

568. C. D. Abel, London. Chimney-cowls. (Com. by H. Hahn, Berlin.) Feb. 6, 1882. Price 2d.

Several conical frustra are placed in the mouth of the cowl, one inside the other, to create a draught. (*Pro. Pro.*)

623. H. Leggott and E. Marsh, Bradford. Cooking-stoves. Feb. 9, 1882. Price 2d.

The smoke is made to pass from the bottom of the grate through a flue, past the ovens, &c., to economise the fuel, (*Pro. Pro.*)

625. J. Winfield, Derby. Fire-grates. Feb. 9, 1882. Price 2d.

The air passes under the grate and up behind the back, and then out through perforations in the upper part thereof to prevent the formation of smoke.

634. T. Brindle, Southport. Veneering or facing walls, &c. Feb. 9, 1882. Price 6d.

The front bricks are taken out of the wall at intervals and replaced by shoddies having dovetailed faces. Stone or ornamental slabs are secured on these shoddies.

647. C. Slagg, Leeds. Preventing the fouling of vertical soil-pipes. Feb. 10, 1882. Price 2d.

A concentrator is used consisting of a tapered pipe inserted in the vertical soil-pipe to prevent the fouling of the sides thereof. (*Pro. Pro.*)

652. J. Stainer, Heckmondwike. Lifting apparatus for stones, bricks, &c. Feb. 10, 1882. Price 2d.

A rope is passed over a pulley on the scaffolding, each end of which has a basket. One is filled with material, and the labourer gets into the other; his weight lifts the full basket. (*Pro. Pro.*)

654. T. Fraser, Aberdeen. Lining for vent-flues or chimneys. Feb. 10, 1882. Price 6d.

The lining is made of red clay or fire-clay, but, instead of being smooth, has annular corrugations or ridges.

658. A. McLean, London. Slabs or panels for decorative purposes. Feb. 10, 1882. Price 4d.

These slabs are formed of cement in moulds, with any raised decorative pattern impressed thereon. When dry they are secured to the walls or ceilings.

663. J. F. Williams, Liverpool. Sliding windows. Feb. 11, 1882. Price 2d.

The bottom of the sash is fitted with runners, which fit into grooves in the side frames. The top of the sash has hooks, which take into openings in the side frames and support the sash. (*Pro. Pro.*)

666. H. J. Haddan, London. Bricks, tiles, &c. (Com. by F. Caucalon, Roaune, France.) Feb. 11, 1882. Price 2d.

The clay is pressed through a perforated plate, and these round strips of clay are again formed into a compact mass, from which the bricks are moulded. (*Pro. Pro.*)

671. J. S. Willway, Bristol. Combined door-mat and scraper. Feb. 11, 1882. Price 2d.

This consists of a series of parallel flat bars on edge, tied together a certain distance apart. (*Pro. Pro.*)

681. J. W. Pitt, Liversedge. Hinges for doors. Feb. 11, 1882. Price 2d.

A recess is cut in the joint of the hinge, in which is secured a coiled flat spring to close the door. (*Pro. Pro.*)

786. J. M. Lamb, London. Ventilators and cowls. Feb. 18, 1882. Price 6d.

The wind vanes are fixed between a series of cones rising one above another. These are all mounted on the usual spindle.

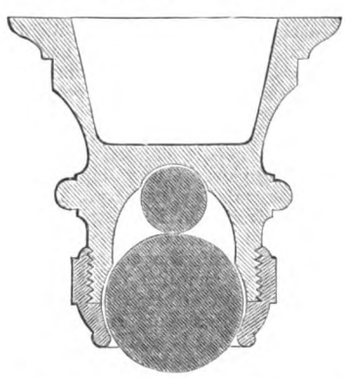
889. J. C. Mewburn, London. Water-closets. (Com. by J. E. Boyle, Brooklyn, and H. Huber, New York, U.S.A.) Feb. 23, 1882. Price 6d.

A pipe is led from the air-space between the two traps of the basin up through the flushing-tank, thence to the open air. When the seat is depressed, water passes from the tank to the flushing-chamber and fills it, driving the air out. When the seat rises the water passes from this chamber into the bowl, producing a partial vacuum in the chamber and syphoning the water from the bowl. After this has been repeated several times the vacuum is broken by the admission of air to the flushing-chamber, and the water gives the bowl a thorough after-flush.

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street.

NEW BALL CASTOR.

HAVING occasion to design some heavy moveable furniture, &c., for which the ordinary form of castor seemed too weak, I at first thought of using the ordinary ball-castors, but found that these do not work well except with light weights. The form of castor shown in the accompanying sketch then suggested itself to me, and on trial I find it answers admirably; in fact, the greater the weight the better it rolls. The sockets and screw-collars are of brass, and



the balls of gun-metal, but cast iron or phosphor-bronze might perhaps be used with advantage for the balls; but if any metal harder than that of the socket be used, it would probably be advisable to insert a ring of steel wire over the top of the smaller ball (as is done in the one-balled castors), so that, if any wear takes place, it may be in the upper balls only, and these can be replaced without much trouble or expense. I trust others of your readers may find the idea of service to them.

Melbourne. J. B. COHEN.

Charterhouse Science and Art School and Literary Institute.—The winter session of this, the largest science and art school in the United Kingdom, will, under the presidency of the Rev. Henry Swann, M.A., commence on Saturday, the 16th of September. During the late session about 700 students availed themselves of the privileges afforded by this institution, and of this number nearly 500 presented themselves for examination, and were successful in obtaining no fewer than 125 Queen's Prizes and twenty honour certificates, awarded by the Science and Art Department of the South Kensington Museum.

SIR CHRISTOPHER WREN.

SIR,—I have read with considerable interest the article [p. 327, *ante*] on "The Genius of Sir Christopher Wren," by Mr. Huggins.

I agree with much that is there stated, but, here and there, there is room for some difference of opinion, notably in regard to his observations upon St. Paul's Cathedral. I will not, however, trouble you with these, but proceed to say that I do differ fundamentally from Mr. Huggins when he goes on to state,—"Nevertheless, his [Wren's] acknowledged failure in the designs of most of his numerous steeples, though they are said to be based on principles laid down in his writings, may justify a doubt whether he had the strength of imagination or poetic fancy and feeling to conceive graceful architectural forms independently of his geometrical resources." In regard to the last part of the clause, I would remark that no true architect, worthy of the name, ever did, or should ever, "conceive graceful architectural forms independently of his geometrical resources," or, if he did, it would be wise to confine them to his sketch-book. We are familiar with "graceful architectural forms independent of geometrical resources" in the backgrounds of the paintings of some of the old masters, but fortunately these have only been constructed upon canvas.

With regard to the first portion of the clause I have quoted, I have recently devoted considerable time to the study of Wren's "Towers and Steeples," and it was a surprise to me to read that "most of his steeples were acknowledged failures." On the contrary, I have no hesitation in saying that most of his steeples are acknowledged successes, and I think I shall be borne out in my statement by most of your readers. It is only necessary for me to run over the names of St. Mary-le-Bow, the campanili of St. Paul's, St. Bride's, St. Vedast; Christ Church, Newgate; St. Michael's, College Hill; St. Stephen's, Walbrook; St. James's, Garlick-hill; St. Magnus, London Bridge; St. Margaret Pattens; St. Martin's, Ludgate; the towers of St. Michael's, Cornhill, and Christ Church College, Oxford; the destroyed spire of St. Antholin's, and many others, to bring before your readers' minds a host of noble, graceful, and clever conceptions.

Were I not fearful of encroaching upon your space it would be easy to show how most of Wren's minor examples are eminently fitted and suited for their positions and circumstances. It will be sufficient for me, I think, to quote the words of that distinguished and lamented Gothicist, the late Mr. G. E. Street, R.A., as conclusive on this matter. He said in an address at the Royal Institute of British Architects, "When I return from some foreign travel . . . I feel a pride in the architectural beauty of the City of London . . . And to what, may I ask, is the beauty of this view owing? There is a magnificent river and a sublime bridge, but beyond and above these, a cluster of towers and steeples of so much variety of design, so skilfully treated, so picturesque from every point of view, as to afford unending delight."

I will not take up more of your valuable space, except with a word in reference to Mr. Huggins's concluding sentence, in which he says he has this "important truth to enunciate:" that "Wren was not of the highest order of architects, his works not being the perfection of architecture." If the "perfection of architecture" (supposing we knew what that was) is the standard by which we are to judge, I know not where to look for an architect "of the highest order," ancient or modern; but judging, as ordinary mortals have to do, by manifested strivings after perfection, he who comes within measurable distance of that has a claim to be enrolled in the highest order of architects, and such a claim I unhesitatingly make for Sir Christopher Wren.

ANDREW T. TAYLOR.

Traction-Engine Disaster.—On the 15th inst. a fatal accident occurred at Harrietsham, near Maidstone. A traction-engine was drawing a thrashing-machine up Stede-hill, a steep ascent, when, owing to the slippery state of the road, some of the machinery got out of gear and the engine ran backwards. William Parker, who was engaged as a labourer to the machine, was instantly killed, another man, named Butler, being badly injured.

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OBITUARY.

Mr. Joseph Pettitt, the artist, died on Saturday, at Balsall Heath. As a young man, Mr. Pettitt, who was a native of Birmingham, was engaged in the papier-mâché trade. His earliest efforts in landscape, exhibited in the rooms of the Birmingham Society of Artists, gave promise of excellence, and attracted for him the support of the late Mr. Joseph Gillott, for whom he painted a considerable number of views of Swiss scenery, and whose friendship and society he enjoyed until Mr. Gillott's death. Mr. Pettitt became a member of the Society of Artists, and afterwards, on removing to London, he became a regular exhibitor at the Gallery of the Society of British Artists, in Suffolk-street, and at the Royal Academy.

Mr. W. B. C. Fyfe died at his residence, Abbey-road, St. John's Wood, on the 8th inst. While he was still very young his crayon portraits attracted considerable notice by eminent Scottish celebrities, including that of the then President of the Scottish Academy, and were sought for far and wide. At the age of fifteen he became a student of the Royal Scottish Academy. In 1861 was exhibited his picture, "Queen Mary resigning her Crown at Lochleven Castle."

EAST SUSSEX, HASTINGS, AND ST. LEONARD'S INFIRMARY COMPETITION.

SIR,—After a careful examination of the drawings submitted in this competition I cannot help expressing my concurrence in the main with your correspondent, "Fair Play" [p. 380, *ante*]. I consider that grave injustice has been done to certain of the competitors who evidently strove to adhere to the spirit of the "conditions," by the premiums having been awarded to authors of designs who not only flagrantly ignored the conditions, but who failed even to evince any knowledge of the simplest elements of hospital planning.

What the arbitrator would say if asked why he too ignored the conditions, upon a reasonable interpretation of which competitors depended for success, I am at a loss to conceive; but it is evident that Mr. Alfred Williams paid but little regard to the feelings of the authors of those designs who sought honestly to win the competition,—indeed, it is evident to any one conversant with the subject that the assessor has showed want of knowledge on the subject. To premiate designs for hospitals of six stories in height without proper ambulance lifts,—indeed, in which lifts are deprecated (I suppose because there was no place for them); with a dead-house within the main building; a whole story underground; rooms planned to look into the hill; wards lighted one story only with corridors between; water-closets and baths, for mixed classes, away from the wards in out-of-the-way places, at the rate of one to twenty, is sufficient evidence of want of knowledge, and must be very provoking to the authors of creditable designs planned with a fair knowledge of the subject.

The estimates, too, are mysterious. The first premium plans will cost 25,000*l*., or 250*l*. per bed, whilst one set of the other premiated plans would only cost 150*l*. per bed,—certainly sufficient, in my opinion. The names of several gentlemen were submitted to the committee, any one of whom would have commanded confidence as assessor. It seems to show that biassed influences were at work somewhere. It would be interesting, at least, to see the arbitrators' report. It may not be generally known that the estimated cost of preparing the forty-five designs submitted in this competition is 1,300*l*. In all there were 270 drawings, some of which were hung in dark passages, some not hung at all, but placed on the floors in confusion so that they could with difficulty be seen or found.

Well may the question be asked, How are competitors to be satisfied, or can they be? Only one way of securing satisfaction occurs to me, and that is, to leave to them the selection of the arbitrator. If each competitor had the privilege of naming, say, six professional gentlemen, and the gentleman whose name had the greatest number of nominations were selected to act in that capacity, I believe the difficulty would be met. JUSTICE.

*** Too late for attention we received several other letters to the same effect, and one very long communication from the author of the second premiated design, Mr. Lansdell, denying the correctness of some of our former correspondent's statements.

HAMMERSMITH BRIDGE.

THE Board of Works for the Fulham District have presented a memorial to the Metropolitan Board, with reference to the proposed rebuilding of Hammersmith Bridge. The memorialists call the attention of the Board to the statistics collected by them of the traffic across the bridge, and point out the complete inadequacy of the scheme for providing for this traffic by means of ferry-boats. In the course of six days of the present month the day traffic amounted to 54,434 foot passengers, and 8,705 vehicles, and the contention of the Fulham Board is that, taking the working hours of ferry-boats of the description and capacity specified by the Metropolitan Board at twelve hours and a half per day, that being the period from sunrise to sunset, they would have conveyed in the six days above referred to 10,800 foot passengers only, leaving 43,634 persons unprovided for; while no provision at all was made for the 8,705 vehicles passing during the same period. It is necessary to add that the specification provides that the two ferry-boats shall each be capable of carrying twelve persons, and shall cross the river every ten minutes between sunrise and sunset, unless prevented by thick fogs or floating ice. The prayer of the memoralists is for the erection of a temporary bridge.

We trust sincerely that this will be listened to. The notion of closing the bridge as proposed strikes those who are aware of the traffic constantly passing over it as so extraordinary that they can scarcely conceive how such a proposal could ever have been seriously entertained by the Metropolitan Board of Works. Unless the Board comply with the prayer of the memorialists, a most grievous calamity will be inflicted on the district.

RAILWAY CLOCKS.

SIR,—I am glad that the two letters published in your paper have caused one more correspondent to write on the same subject. My principal object in writing is an attempt to awaken some public interest in the matter.

From what we see around us, and from what I know from experience, neither the Government nor the railway companies take much interest in public timekeeping.

Mr. Lakeman Herbert's suggestion to have double cases for railway clocks, lined with vulcanite, would do very well; but double cases and vulcanised linings would not make bad or common clocks go correctly, and railway companies will not pay for first-rate clocks.

The knowledge of clocks and watches is, of course, very limited, to say the least of it, but the same rule holds good of them as of other things,—if we want first-rate work we must pay first-rate prices. People seem to think there is a mystery about clocks and watches, that it is all a chance, it does not matter much what is paid, except as regards the outside. The same strange ideas also prevail with regard to the length of time that clocks can last. Railway people can understand that the permanent way, the rolling stock, &c., must be renewed, and that they do not work so well when old as when they are new; but not so with their clocks: they must not want much repair, and as for sometimes having new clocks altogether, instead of the old ones, that would be considered out of all reason. It is only clocks that are expected to work as well when they are old as when new. Other things in this world, human beings included, are allowed to be a little shaky and unpunctual as they get old. Not so with clocks: many years working night and day must show no effect,—clocks must enjoy everlasting youth, and, after working many years, die in a state of infancy. As I said in my last letter, it is all a question of money. We have plenty of clever men who know what to make, and how to make it; but as long as they are beaten down to the last shilling they cannot do the best work; and the worst of it is, if we go on much longer the same way, we shall not be able to get first-rate work at any price.

I know for a fact that American clocks have been bought and used on the platforms of a large London railway, and I am told that Government have bought American watches for India. What would people say if our soldiers were supplied with bad guns, only because they were cheap?

CHRISTIAN LANGE.

The Duke of Albany.—We understand that H.R.H. Prince Leopold, Duke of Albany, has consented to accept the Presidency of the Parkes Museum, which is about to be re-opened in Margaret-street, Cavendish-square.

SMOKY CHIMNEYS.

SIR,—My attention has been called to an article in your paper respecting the cause and cure of smoky chimneys; and I am glad to find a section of the British Association is about to make practical experiments with a view to the abatement of the nuisance. Such an inquiry must of necessity be useful and interesting; but I fear the practical result will not be very satisfactory. The cause and cure bristle with difficulties. As an engineer, I have paid great personal attention to ventilation and smoky chimneys for many years. I consider these two sciences, if I may call them such, are nearly akin.

I am daily called on by some sufferer to give my advice and provide a remedy, but I must confess I am often sorely puzzled. I may here say I never undertake a cure unless I can do whatever I please. My first duty is to find out if there is a down-draught in all weathers, or only when the wind is in a certain quarter. After getting all information possible, I commence my careful examination at the bottom, and, trace the course of the brick or pipe flue up to the chimney-pot. I also pay a visit into the false roof, and frequently find a defect there. To save money, very often the chimney-stack here has never been plastered, and there is a suck of cold air through the defective brickwork: this would cause any well-constructed chimney to smoke. Again, I find a crookedly-built chimney (no dips) often smokes badly, while in the same house a perfectly straight chimney draws well. I go a little further on, and find just the reverse,—the crooked chimney pulls well, but the straight one will not go at all. Sometimes I fancy a tree in the immediate neighbourhood causes mischief. Against this theory, I find a great many chimneys situated far away from trees or buildings smoke badly, although the house enjoys an elevated position. I have a theory that on a stormy day the wind current may strike a house at a certain angle, and make the chimneys smoke; but, strange to say, while on these stormy days one chimney refuses to act upwards, all the rest draw powerfully, and I have known all these peculiarities occur in well-built chimneys. If the door and windows of a room are air-tight, then the room may try to supply itself with fresh air down the chimney. A good plan in such a case is to put in a Tobin's ventilator; but there are many chimneys which refuse to act with both windows and door open. I have known smoke emitted from a chimney carried across a wide street by the wind, and when it reached the houses on the other side of the street, it was sucked down a chimney, and the room was partly filled with smoke. There was no fire in this room. I ventilated it, and raised the chimney, and the nuisance did not occur again. As I mentioned before, I do not allow any restrictions as to cost, because if I did I should mostly fail in my object, as others do. I see that the grate is properly constructed; if it is not, I alter it or condemn it; if the latter, I recommend an Abbotsford. Great care it required in setting all grates, and none bus thoroughly experienced men should set them; there should be no flat coverings over for the smoke to kick against, nor any unbuilt corners behind the grate for the lodgment of cold air,—another friend to a smoky chimney. The backing up of a grate should be solid and gradually gathered up right into the throat of the main flue. Having made all right at the bottom, and assured myself that the upright shaft is free from obstruction (built straight or dog-legged, I do not think it matters much which), I examine the chimney-pot and frequently find the outlet very much contracted; here is danger, because the sweep, finding his brush tightens, considers he is at the top, whereas his brush has not gone through by 2 ft. or 3 ft. This, repeated every three months, rams the soot into a solid mass, and eventually closes the smoke-vent. I come across many such cases. I prefer the outlet being a little wider than the main flue. Generally I have come to the conclusion that theory will not cure smoky chimneys. A man undertaking these duties must be experienced and painstaking, and not afraid of soot. I seldom fail. I cured four of the worst description last week. I have registered a simple top made in galvanised iron, which has proved so far a success in every case. It is not a spinner. I do not like them; the latter often provoke the smoke nuisance.

JOHN PINDAR, C.E.

DANGEROUS BUILDING: OVENS.

MR. CARTTAR, West Kent Coroner, has held an inquiry, at the Prince Arthur, Arthur-road, Beckenham, on the bodies of Henry Bailey, aged thirteen, of 8, Oak Town-terrrce, Arthur-road, and George Hobbs, aged fifteen, of 46, Arthur-road, Beckenham, who were killed by the falling in of the roof of an oven on Thursday, the 31st of August. The evidence showed that on the day named the two boys, with a third, named Blizzard, were engaged in cleaning out an oven on the premises of George Blick, baker, of 12, Arthur-road, in order to prepare it for baking, the oven having been built about ten days previously by a bricklayer named Charles Coomes, of Hoxton-street, Hoxton, for a contractor, named Alexander Paul Cuming, of Albert-road, Old Ford-road. Whilst the boys were so engaged the roof of the oven fell, burying the three lads under the fallen brickwork. Blizzard was rescued alive after the lapse of about fifteen

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minutes, being pulled out by the legs, and he managed to walk home; but some time elapsed before the other two boys could be got out, and then they were dead.

Coomes said he had no drawings by which to build the oven, but took verbal instructions, Cuming inspecting the work as it proceeded, and expressing his approval of it. The three boys in the oven had a light to work by, but the job had only been given to one boy, and he did not know how the other two came to be in the oven. He had been told the boys had been jumping on the top, and any oven would have fallen in after that. The outer walls had been built about six weeks, and it would take a month for the mortar to dry.

Mr. Carlton, surveyor to the Beckenham Local Board, said the crown of the oven did not correspond with the plan submitted to the Board. The ring of the arch was simply 4½ in., and any kind of rubbish had been placed between the bricks. Witness had no opportunity of going to see the work in progress, as the plan had only been passed three days before the accident. The building should not have been commenced without the sanction of the Board, and he should have condemned it. The bricks were adapted to the purpose, but the mortar was very inferior. Mr. C. A. Pope, barrister, who attended for Cuming, called Mr. H. Lefevre, engineer, to prove that the work in the oven was good, and that question occupied the attention of the jury a considerable time. Ultimately the jury returned a verdict in both cases of "Accidentally suffocated by a baker's oven falling in," and the coroner severely censured Cuming and Coomes for the scamping work and bad material in building the oven.

CHURCH-BUILDING NEWS.

Plymouth.—The new spire at St. Jude's Church, Plymouth, is now all but complete, and the scaffolding having been cleared away, its satisfactory effect is apparent. It has been designed by Messrs. Hine & Odgers, architects, Plymouth, from whose plans the church itself was erected some few years ago. The tower and spire are built entirely of worked limestone with Portland stone dressings, boldly buttressed. Mr. Blowey, of Plymouth, was the builder, and Mr. Harry Hems, of Exeter, has executed the stone carving, &c.

Whitby.—At a recent meeting of the committee appointed to negotiate for the construction of a new church on the West Cliff, Whitby, the rector (Rev. George Austen) in the chair, a letter was read from Sir George Elliot, bart., M.P., in which, reverting to the promised subscription of site and 2,000*l.* towards the fund, he reminded the committee that, in appointing Mr. Armfield as architect, they had forgotten the conditions attached to the gift, namely, that he should be consulted as to the appointment of architect. After some discussion, it was agreed, with some expression of sorrow, to rescind the resolution referred to, and Mr. Johnson, of Newcastle, was unanimously appointed architect.

Seaton.—The foundation-stone of a new church at Seaton, Cumberland, has been laid. The church will be in the Gothic style, and will comprise a nave and chancel, with open-timbered roof. The interior fittings will be of pitch pine; on the north side there will be a small bell-tower, 50 ft. high. The chancel will be aspidal in shape, and will be lighted with three lancet and two tracery windows. In the nave there will be seven windows, and at the west end two lancet windows and a rose window. The church will seat 240 persons. The architect is Mr. George Watson, Penrith, from which place the various contractors come.

Preston.—St. Paul's Church, Preston, was re-opened on the 27th ult., having been closed since the early part of the year for purposes of cleaning, extension, and alteration. A new chancel has been erected, extending 18 ft. beyond the line of the old building, and fitted up with clergy and choir stalls, the organ having been removed from the west end of the church to a new organ-chamber at the south of the chancel. The walls, ceiling, and roof of the church have been coloured, and the space previously occupied by the organ has been fitted up with 150 free seats. A large arcaded baptistery has taken the place of the old vestry, and in this is to be placed a memorial font of white marble, presented to the church by Mr. J. Huntingdon, of Cleveland, Ohio, U.S.A. Another memorial is a stained-glass window, representing the "Ascension of our Lord," and presented by Mr. James Hall, of Preston, in memory of his late wife. A pulpit of oak has been promised, but is not yet placed in the church. The organ has been cleaned and repaired by Messrs. Jardine & Co., of Manchester. The amount of the contract for the extension and cleaning of the church was 2,029*l.*

Pensnett.—St. Mark's Church, Pensnett, has been re-opened for worship, after being closed for two months, during which period Messrs. Hardman & Co., of London and Birmingham, through the instrumentality of Mr. Pippett, have been busily engaged in decorating the church. In the body of the edifice the walls have been coloured and painted a vellum tone, and when the work, which is yet incomplete, has added to it the finishing touches, Scriptural texts will be inscribed upon the walls all round. It is, however, the chancel upon which the greatest amount of work has been bestowed. The roof has been treated in brown and white, the rafters being left their natural colour, and relieved with repetitions of the letter "M" in white, signifying St. Mark, the patron saint of the church, whilst the principals are picked out in vermilion and white. The upper part of the walls have been powdered with an emblem of St. Mark, treated in an heraldic manner, and inscribed with a motto of the saint. The north and south walls of the chancel will, when finished, have painted upon them subjects representing St. John Preaching in the Wilderness, and Mary Magdalene at the tomb. On the south side of the chancel is Lord Dudley's private chapel, and this, it is stated, his lordship intends to have decorated at his own expense. Upon the four panels of the pulpit are let in representations, painted upon canvas in oil, of the four Evangelists, with St. Mark in the centre. This portion of the decorations was the work of the Rev. C. H. Dicker, one of the curates of the church. Altogether the cost of the work has been about 400*l.*

Seaford.—At a public meeting just held in the town-hall, Seaford (Sussex), plans for the restoration of the fine old tower of the parish church were considered. Mr. Lee (Lee & Son, architects) stated that the tower dated back to the time of the Normans, and was remarkable for the symmetry and elegance of its proportions. The total estimated cost of the work is nearly 1,000*l.*, and it was decided to adopt the plans and carry the work out in sections, if the requisite amount for the whole work cannot at once be raised.

DISSENTING CHURCH-BUILDING NEWS.

Rock (near Horrabridge, Devon).—On the 23rd ult. a new Bible Christian Chapel was opened here. The structure adjoins the old chapel built in 1866, and provides sitting accommodation for about 170 persons,—the old structure having been retained as a schoolroom. The architect was Mr. J. Crocker, Exeter, and the builder, Mr. Blowey, Mutley. It is built of local stone, with granite quoins, the ceiling, like the seats and rostrum, being of pitch-pine and white deal intermixed. The flooring of the aisles is of Minton's tiles, and the walls internally are stuccoed above the dado rail, which is about 4 ft. above the floor. The style is Gothic. The cost has been about 300*l.*

Colwyn Bay.—The corner-stones of the chapel, schools, and minister's manse, which are now in course of erection at Colwyn Bay, have been formally laid. The buildings will complete a scheme set on foot by the Rev. Dr. Morley Punshon to provide for the spiritual wants of English Wesleyan Methodists resident in or visitors to North Wales. The memorial church, which is dedicated to St. John the Divine, is erected in honour of the late Dr. Punshon's intimate connexion with and zealous support of the movement, and out of respect to his memory the cost of the tower and spire is being defrayed by the ladies of Brixtow, and that of the pulpit by the ministers of the Connexion. The materials used in the construction of the chapel and schools are Yorkshire stone, with local stone dressings. The style of the buildings is Decorated. The chapel will accommodate about 700 persons. The architect for the whole of the works, which are being executed by Messrs. Foulks & Son, Colwyn Bay, is Mr. Robert Curwen, London and Liverpool, the amount of the contract being about 6,000*l.*

Wednesbury.—Spring Head Wesleyan chapel, Wednesbury, was re-opened on the 9th inst., having undergone transformation at the hands of Mr. J. J. Trow, painter and decorator, from designs prepared by Mr. C. Newman, architect. The decorations are in the Corinthian style. The whole of the woodwork has been stained and varnished. The organ has also been repaired. The pipes of the organ are elaborately decorated in marone, green, and drab, with gold bands.

Harrogate.—A new Baptist church is in course of erection here. The building is Decorated in style, and comprises, in addition to the church, two vestries, a lecture-room, class-rooms, and attendant's dwelling, erected upon two sides of the present school chapel. The church consists of a nave—without aisles,—transepts, and chancel; the latter contains the baptistery, which will be of white marble. The roof will be a hammer-beam and arched roof in pitch pine, finished with boarding instead of plaster work. The seats are also of pitch pine,—open benches, calculated to seat 600 persons. The exterior is in stone, Burley stone being used for dressings, and Pateley Bridge pitched faced stone for walling. The entrance-doors will be deeply recessed and elaborately moulded with red Corsehill stone shafts, with carved capitals. At the south-west corner there will be a tower and spire, together about 130 ft. in height. The roofs will be covered with blue Welsh slates in green bands, finished with ornamental red terra-cotta ridge. The lighting will be by gas, Benham & Sons' ventilating globe light being adopted for the purpose. The lecture-room has an octagonal end, and can be divided into two rooms by a revolving partition, erected by Messrs. Salmon, Barnes, & Co., of Ulverston. The architect for the work is Mr. Wm. Peachey, of 36, Coney-street, York. The following are the contractors for the various kinds of work:—Brick and stone work, Mr. Matthew Wilson, Headingley; slating, Messrs. Watson, Worsnop, & Co., Leeds; plastering, Mr. Charles Fortune, Harrogate; carpenter's and joiner's work, Mr. R. A. Raworth, Harrogate; plumbing and warming apparatus, Mr. S. Rushworth, Shipley; glass work, Mr. Hodson, Stonegate, York; painting, Messrs. Knowles & Son, Harrogate; stone carving by Messrs. Thorpe, of Leeds. The Clerk of the Works is Mr. G. Fletcher, of Manchester.

SCHOOL-BUILDING NEWS.

Otley.—New Sunday schools were opened here on the 6th inst. The schools are in plain Gothic style, built in a substantial manner of Idle wallstones, with local ashlar dressings. The large school-room is 73 ft. 6 in. by 31 ft. The entrances to this room are by two porches in the front; and four class-rooms, average 14 ft. by 16 ft., are arranged on the south side of it, with communications to each from the large room. The inclination of the ground has enabled the architects to obtain under these class-rooms a large room (53 ft. by 14 ft.), intended for use of boys; also a tea-room, which may be used as an additional class-room if required. An internal staircase connects the two floors, and an outer door is provided for lower rooms, level with yard. The large room is calculated to seat, when used for concerts or entertainments, nearly 600 people, and is exceedingly lofty, and provided with Boyle's patent air-pump ventilators. The works have been carried out under the superintendence of Messrs. Fairbank & Wall, architects, Bradford and Otley; and the contractors have been as follow:—Masons, Cordingley & Wildmar, of Idle; joiner, Wm. Hartley, of Ilkley; plumber, Squire Farrand, of Otley; plasterers, J. & W. Chaffer, of Otley; slater, James Smithies, of Bradford; and painter, G. R. Forster, of Otley. The iron railing and gates have been provided by Exley & Son, of Otley. The cost, including site, has been about 2,000*l.*

Shibden (near Halifax).—A new wing, containing a large and commodious school with two class-rooms, a spacious dormitory, and several store-rooms, &c., has been added to the Shibden Industrial School. It is about twelve months since the foundations were laid. The building is a three-storied one. Leading from the staircase in the basement is a room where a warming apparatus has been fixed. In the basement a swimming-bath has been constructed. Over the bath is the new school, which is capable of seating 400 persons. This room is well lighted and lofty, and is fitted up with hot-water pipes, whilst at one end are two large class-rooms. A wide staircase leads to the new dormitory, to contain eighty beds. The new premises have been carried out under the supervision of Mr. John Lister. Mr. Simpson, of Bradford, has been the architect; and Mr. Cordingley, of Halifax, the builder.

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VARIORUM.

AMONG the cheap books,—the wonderfully cheap books,—now appearing we would mention Carlyle's "Heroes and Hero Worship," at 6d., and the "Life of Richard Cobden, by John Morley, at 1s., both issued by Chapman & Hall (Limited). They are well printed on good paper.

Miscellanea.

The Valuation of Shoreditch.—The annual report, just issued, by Mr. Enoch Walker, vestry clerk of the parish of St. Leonard, Shoreditch, shows a remarkable advance in parochial wealth which is being made by the parish, the rateable value of which will presently receive a heavy addition by the assessment of the new goods station of the Great Eastern Railway Company in Shoreditch High-street. The valuation list shows a gross rental of 731,301*l.*, and a rateable value of 588,989*l.*, being an increase during the past year of 10,134*l.* and 8,578*l.* respectively. The rateable value of the parish includes the following items:—Railways, 50,085*l.*; Gas Companies, 28,344*l.*; Water Companies, 7,350*l.*; Tramways, 2,500*l.*; Regent's Canal, 738*l.*; Board Schools, 5,412*l.*; Hoxton House Asylum, 1,000*l.*; theatres and taverns attached thereto, 3,322*l.*; the town-hall, 1,000*l.*; assessments of 500*l.* and upwards, including model dwellings of that value, 15,875*l.*; the workhouse and infirmary belonging to the Holborn Union, in the City-road, is by local Act rated at only 19*l.*, and the remainder are ordinary assessments under 500*l.*

Fatality to a Carpenter at Westminster. On Wednesday evening, at the Sessions House, Westminster, Mr. Langham held an inquest on the body of Charles Goddard, a carpenter, aged 48. The deceased was in the employment of Mr. Joseph Lewsey, a builder, and on Tuesday, the 12th inst., was engaged with other men in repairing the premises belonging to the Institution of Civil Engineers, Great George-street, when a rope attached to a piece of timber, which was being hoisted at the time, gave way, and the deceased, who had hold of the rope, was thrown on to some spiked railings beneath, a distance of several feet, and received a severe puncture of the right thigh. The deceased died on the 16th inst. from exhaustion, consequent upon blood-poisoning. It was found necessary to amputate the limb. A verdict of "Accidental death" was returned.

Association of Municipal and Sanitary Engineers and Surveyors.—The programme of the Northern District Meeting of this Association, to be held at Tynemouth, on Wednesday next, the 27th, is before us. The members will assemble at 11.30 in the Council-chamber, Saville-street, North Shields. The following papers will be read and discussed:—"*Resumé* of Discussion on Paper on Private Improvement Apportionments," by Jas. Hall, Borough Surveyor, Stockton; "The Operation of the Canal Boats Act," by E. C. B. Tudor, C.E., Surveyor to the Goole Local Board. During the day the new Coble Dene Dock Works and Pier Works, by the courtesy of Mr. P. J. Messent, the Engineer to the River Tyne Commissioners, will be visited.

Messrs. R. W. Winfield & Co., of Birmingham and Holborn Viaduct, have acquired the well-known stained-glass business of Messrs. Camm Brothers, of High-street, Smethwick, near Birmingham. We learn that they intend to fully develope the various branches of the business, which will, for the present, be carried on at the same premises at Smethwick, and they have retained the services of Mr. T. W. Camm and the same staff of assistants as heretofore. What Messrs. Winfield & Co. do they generally do well.

The Papier Mache Company.—This Company, long established in Wellington-street, Strand, have lately published two useful additions to their issue of trade books; one "Chimney Pieces," manufactured by the company; and the other, "Architectural Ornaments," among which are many tasteful designs. The company are successors of the well-known Bielefeld & Co., established as long ago as 1826.

Brighton.—The ninth annual exhibition of modern pictures in oil, 1882, will open on this Thursday, September the 21st, in the Royal Pavilion Gallery. The private view took place on Wednesday, September 20th.

A Plea for Tree-Planting in Ireland.—"A dreary treeless waste" will shortly be the appellation of our otherwise justly favoured isle, as we have lost the homestead law and timber-planting mania of our forefathers. We ought to learn from the tree-planting lairds of Scotland, where the Duke of Athole can boast of 27,000,000 trees, covering 15,000 acres. The vast woods and plantations exist for use as well as ornament, and the Duke plants annually from 600,000 to 1,000,000 trees. During the past planting season, 2,000 acres were laid out, and the once desolate and bare region, the Dunkeld Hills, are now a place of beauty. The plantations consist of every variety of timber, but recent nurseries are set with white willow trees, as they are in popular demand, and the wood is worth 1s. 6d. per foot for cricket-bats and other purposes. Clean and best quality butts of 9 in. diameter fetch from 2s. 6d. to 3s. 6d. per foot in the London market. These are planted in marshy tracts, where they thrive and grow rapidly from stumps and cuttings. We think our rural industries could be further stimulated by tree-planting, as the season is fast approaching. Ozier culture pays as high as 10*l.* per acre in the moist grounds of the North and South of Ireland.—*Freeman's Journal.*

The French Archæological Society.—This society is on the eve of holding its forty-ninth annual session, with a very full and highly interesting syllabus of operations. These begin at Avignon on Tuesday next, the 26th of September. Excursions are laid out to Villeneuve, Orange, Carpentras, Vaison, Aubune, Gigondas, and Vénasque, all abounding in Roman, Mediæval, and Renaissance curiosities. The Avignon session, which closes on Saturday, the 30th, is to be supplemented by a four days' visit to Fréjus and its neighbourhood, La Tourrache, Le Pont des Esclapes, St. Raphael, Boson's Mine, and the Gaul's camp at Auriesque. The semi-centenary of the society will be celebrated next year at Caen, at the foot of the statue of its founder, M. A. de Caumont.

The Law on Ancient Monuments.—One of the last Acts passed in the recent session (45 & 46 Vic., c. 73) was for the protection of ancient monuments. The law is now operative, and may shortly be enforced. Power is given to constitute the Commissioners of Public Works the guardians, and any owner of an ancient monument may by deed place the same under their guardianship. The Commissioners are empowered, with the consent of the Treasury, to "purchase ancient monuments," and inspectors of ancient monuments may be appointed. Penalties by fine or imprisonment to be imposed for injury done to ancient monuments in a summary manner in the United Kingdom.

The Royal Institution, Manchester.—On Saturday last Mr. T. C. Horsfall personally conducted a number of workpeople and representatives of the working men's clubs through the various rooms of the Manchester Royal Institution. Two hours were well spent in describing the beauties of the art-treasures, and great interest was manifested by the members of the party.

New Route to the Continent. — The Hundred of Hoo Railway, a stretch of thirteen miles, from Gravesend to Port Victoria, Isle of Grain, is now complete, and the first passenger train from the new terminus at the entrance to the Medway to the metropolis was run on the 11th inst. The works at Port Victoria are being pressed forward with unremitting energy.

Raffaelle.—To celebrate the fourth centenary of the birth of the great painter, a committee, under the presidency of H.M. the King of Italy, has been formed with the view of erecting a monument at Urbino, his native place. Besides a statue of Raffaelle, allegorical statues and bas-reliefs may form part of the design.

The Social Science Congress at Nottingham was opened on Wednesday last, when the president, Mr. G. W. Hastings, M.P., delivered an interesting address, in which he treated of questions concerning the ownership and tenure of land, food supply and population, the poor-law system, and education. We shall next week report some of the papers and discussions likely to interest our readers.

Proposed Roman Catholic Cathedral, Westminster.—The proposal to build a cathedral adjoining Cardinal Manning's present residence in the Vauxhall Bridge-road, at a cost of 100,000*l.*, but which was temporarily abandoned five years ago, has been again revived.

TENDERS

For alterations and additions to Marsh-street Schools, for the Walthamstow School Board. Mr. W. A. Longmore, architect. Quantities by Messrs. J. & E. Goodchild:—

Thomson & Tweed	£3,578 0 0
W. H. Smith	2,268 0 0
W. J. Beale	2,225 0 0
Treweeke & Co.	2,182 0 0
Priestley & Gurney	2,140 0 0
Hawkins	2,112 0 0
Swain	2,045 0 0
Palmer & Co.	1,995 0 0
J. A. Reed	1,971 0 0
Fuller	1,960 0 0
W. Thomerson & Son	1,950 0 0
S. J. Scott	1,947 0 0
C. Collins	1,922 0 0
T. Russell	1,919 0 0
Parrish & Hawker	1,894 0 0
Stayner	1,894 0 0
R. & E. Evans	1,720 0 0
G. Parker (accepted)	1,719 0 0

For the construction of sewer extensions at Skym Corner, Princes Plain, and Widmore Green, for the Bromley Local Board. Mr. Hugh S. Cregeen, surveyor:—

A. J. Blake & Co.	£104 10 0
Jas. Taylor (received too late)	80 13 0
J. Bentley	73 10 0
T. Lansbury	58 0 0
Davis & Attwood (accepted)	52 5 0

For additions to "Harcourt," Bickley, Kent, for Mr. R. P. Langmore. Mr. W. Hewson Lees, architect:—

Sperring	£681 0 0
Arnaud (accepted)	545 0 0

For the erection of a Bible Christian Chapel, High-road, Lee, for the Trustees. Mr. Wm. Theobalds, architect. Quantities by Mr. B. Swinstead. Amended estimate:—

Edgar Banks, Lewisham (accepted)	£3,100 0 0

For alterations and additions to Yorkshire Grey, Langham-street. Mr. Treacher, architect:—

Croaker	£3,175 0 0
Beale	3,130 0 0
W. Shurmur	3,076 0 0

For rebuilding the Philharmonic Theatre, Islington. Mr. Matcham, architect:—

J. H. Brass	£12,300 0 0
Lawrence	12,200 0 0
Colls & Son	11,900 0 0
Bangs	11,860 0 0
Dove Bros.	11,775 0 0
Williams & Son	11,692 0 0
Longmire & Burge	11,135 0 0
McCormick & Sons	10,755 0 0
W. Shurmur	10,548 0 0
C. Wall	9,956 0 0
Wall Bros.	9,874 0 0
Tims	9,719 0 0

For storage and filter tanks, drainage, &c., at Collingwood, for Col. Lempriere, R.E.:—
Allcock, Camberley (accepted).

For alterations and repairs to the Garrick, Leman-street, Whitechapel, for Messrs. Wests & Peggs. Mr. Edmeston, architect:—

Herbert	£320 0 0
Green & Son	185 10 0
Thomerson & Son	154 0 0
Frost	136 0 0

For pulling down and rebuilding two houses and shops, 352 and 354, Bethnal Green-road, for Mr. Meadway. Mr. J. Harris, architect:—

Wise	£2,140 0 0
Staines	2,084 0 0
Beale	1,790 0 0
Forrest	1,775 0 0
Thomerson & Son	1,760 0 0
Russell	1,754 0 0
Barrow	1,564 0 0
Parrish	1,450 0 0
Walker	1,447 0 0

For repairs, &c., to house, at Wood End, near Great Marlow, Bucks, for Mr. R. Crossman. Mr. Chas. Carter, architect, Great Marlow. Quantities supplied:—

Fletcher	£486 10 0
Gibson	448 0 0
Carter	430 0 0
Lovell (accepted)	415 0 0

Repairs to Farm Buildings.

Lovell (accepted)	£215 10 0

For the erection of Wesleyan Chapel in Victoria-street, High Wycombe, Bucks. Mr. C. Carter, architect. Quantities supplied:—

Holland, Thame	£965 0 0
Harris, Wycombe	959 1 0
Nash, Wycombe	861 10 0
Lacey, Wycombe	860 0 0
Gibson, Wycombe	859 0 0
Hunt*	838 0 0

* Accepted in part after omitting various works.

For works required in the restoration of buildings destroyed by fire at New Barn homestead, near Great Marlow. Mr. C. Carter, architect:—

Plumridge	£279 15 9

For works required in the restoration of the Queen Adelaide, Hare Hatch, near Twyford, Berks, for Messrs. Wethered. Mr. C. Carter, architect:—

Gregory	£237 0 0

For the erection of new buildings at Gunpowder Mills, Bourne End. Mr. Chas. Carter, architect. Quantities supplied:—

Hollings	£800 0 0
Hunt	760 0 0
Gibson (accepted)	758 10 0

For the erection of boat-house at Cookham, Berks, for Mr. J. Llewellyn. Mr. C. Carter, architect:—

Cox (accepted)	£220 0 0

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For proposed additions to St. Mary's Servite Priory, Stamford-hill. Mr. Jos. S. Hansom, architect, 27, Alfred-place West, South Kensington :—

H. Miller, George-street, London-fields	£4,496 0 0
W. Thomerson & Son, London-street, Hackney-road	3,570 0 0
D. C. Jones & Co., Cromwell-street, Gloucester	3,390 0 0
Staines & Son, Great Eastern-street	3,264 0 0
J. Angood, 53, Evershot-road, Tollington Park	2,975 0 0
S. J. Scott, Bell-alley, London-wall	2,943 0 0
G. Parker, 124, Sumner-road, Peckham	2,875 0 0
R. & E. Evans, Lisford-street, Peckham	2,792 0 0

For new girls' and infants' school, with mistress's residence, Cranford, Middlesex. Mr. Robert Willey, 66, Ludgate-hill, architect :—

Penny & Co., Ealing	£1,120 0 0
Hansom, Southall	1,097 0 0
Smith, Kennington	1,085 0 0
Dorey, Brentford	1,045 0 0
Brown, Southall	1,030 0 0
Nye, Ealing	995 0 0
Keen Bros., Hounslow	928 3 0

For alterations and additions to Woodford House, Woodford, for Mr. Edward Rider Cook. Quantities not supplied. Mr. J. T. Newman, architect, 2, Fen-court :—

Egan	£2,685 0 0
Lynde	2,500 0 0
Cox	2,479 0 0
Reed	2,464 0 0
Wells (accepted)	2,455 0 0
North Bros.	2,225 0 0

For construction of service reservoir, &c., near Stubshaw Cross, and laying and jointing water mains, for the Abram Local Board. Quantities by the engineer, Mr. G. Heaton :—

Service Reservoir.

Wm. Ascroft	£1,943 0 0
Fawkes Bros.	1,793 10 7
Harris & Jenkins	1,567 9 11
Henry Hodkinson	1,559 16 9
Holme & King	1,482 2 0
Wm. Winnard	1,299 0 0
Wm. Cunliffe (accepted)	1,174 12 0

Laying Water Mains.

Harris & Jenkins	£2,861 15 6 !
W. H. Rigby	1,550 0 0
H. Hodkinson	1,288 3 3
Wm. Winnard	1,160 0 0
Holme & King	1,039 0 0
Ashmore & Bromley	896 5 10
Fawkes Bros.	856 16 5
Wm. Cunliffe (accepted)	856 15 0 !

For completion of three houses, Beech-road, Weston-super-Mare. Messrs. Price & Wooler, architects :—

S. Taylor Harvey (accepted)	£320 0 0

For the erection of new premises, Oxford-road, Reading, for Messrs. Sutton & Cork. Messrs. Brown & Albury, architects :—

Grover, Reading	£1,008 0 0
Searle, Reading	1,003 0 0
Strong Bros., Reading	984 0 0
Lewis, Reading	925 0 0
East, Reading	920 0 0
Denton, Reading	862 13 0
Wernham, Reading	852 0 0

For new premises, Broad-street, Reading, for Mr. J. W. Hounslow. Messrs. Brown & Albury, architects :—

Searle	£1,417 0 0
White	1,389 0 0
Kingerlee	1,325 0 0
Higgs	1,288 0 0
Wernham	1,245 14 0
Strong Bros.	1,215 0 0
Bottrill (accepted)	1,196 0 0

For warming, by means of their improved apparatus, the swimming-bath, Lancaster Grammar School :—

J. Weeks & Co., Chelsea	£86 0 0

For proposed additions to residence, Hadlow, Kent, for Mr. D. Ashwell. Mr. E. W. Stephens, architect, Maidstone :—

Wallis & Clements	£498 0 0
Cox Bros.	476 0 0
Punnett & Sons	447 9 9
Avard	445 0 0
Maytum Bros., Sutton Valence	439 0 0

For additions and alterations to the laundries, Shoreditch Workhouse. Mr. J. Wallace Pegge, engineer :—

Builder's Work.

B. Nightingale	£1,270 0 0
H. M. Miller	1,248 0 0
W. J. Sharp	1,231 0 0
J. J. Robson	1,231 0 0
Taylor & Parfitt	1,173 0 0
Job Smith	1,169 0 0
W. Thomerson & Son	1,166 0 0
J. Ivory (accepted)	1,165 0 0
J. Angood	1,135 0 0
William Shurmur	1,134 0 0
James Harper	1,132 0 0
S. J. Scott	1,087 0 0

Machinery and Fittings.

Bradford & Co.	510 0 0
R. Perrin	429 0 0
W. Williamson	428 0 0
Benham & Sons	396 0 0
J. & F. May	375 0 0
C. Jeakes & Co. (accepted)	371 0 0

For the erection of new Baptist Chapel, Sutton, Surrey. Mr. Herbert D. Appleton, architect, 264, Wool Exchange, Coleman-street. Quantities by Mr. Edward Crutchloe, of Albert-chambers, Victoria-street :—

Gregory	£5,137 0 0
Dove	4,685 0 0
Clarke & Bracey	4,683 0 0
Howard & Dorrell	4,656 0 0
W. Smith	4,589 0 0
King & Son	4,527 0 0
Merritt & Ashby	4,510 0 0
Shurmur	4,471 0 0
Nightingale	4,444 0 0
Roberts	4,436 0 0
Jones	4,396 0 0
Deards	4,281 0 0
Hobbs	4,245 0 0
Potter	3,865 0 0
Humphris	3,743 0 0

For alterations and additions to the Bridge House Tavern, Tredegar-road, Bow, for Messrs. Truman, Hanbury, & Buxton. Mr. B. J. Capell, architect :—
W. Shurmur (accepted).

The tender of Messrs. Perry & Co. has been accepted for the new shops and offices, 37, 39, and 41, St. Mary Axe, 7,529*l.*

TO CORRESPONDENTS.

W. P. R. (a plaster cornice is measured from the nose of the mould to the wall).—J. C. (thanks).—E. L. H. (descriptions and plans of Turkish baths have appeared in the *Builder*, but we cannot look back).—B. S. (we decline uniformly to point out books).—W. T.—H. W. P.—J. E. J.—H. W.—Y. & M.—N. M.—H. M.—B. & A.—S. F. C.—H. & R.—A. C.—C. B.—T. R. H.—E. R. R.—G. J. S.—G. S. A.—T. C.—P. & Co.—C. S. (particulars were mainly illegible.—J. S. H. (ditto).—M. J. L. (too late).—B. C. (ditto).—Untinted (ditto).

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VOL. XLIII. No. 2069. SATURDAY, SEPTEMBER 30, 1882.

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Bristol going ahead.

TO ascertain the part of the world from which the megalithic blocks which formed the prehistoric sanctuaries and fortresses of Stonehenge and of Avebury were derived is the object of a problem not unfrequently alluded to in our columns. Before the birth of the science of geology, indeed, little curiosity was felt on the subject. Stones, it was thought, were stones. There they were, and that was all that was to be said about it. A little later, when the investigations set so efficiently on foot by Cuvier were chiefly regarded in this country in relation to their supposed theological, or anti-theological, bearing, a clerical writer on Avebury gravely propounded the theory that the "sarsen stones," with which the tourist over the Wiltshire downs is so familiar, were "excreted from the chalk by the action of the deluge."

Not feeling altogether convinced by the arguments of the reverend gentleman to this effect, we yet felt disinclined to adopt the theory, which is that of what we will call geological orthodoxy, *i. e.*, that these stones were transported on ice-floes, and dropped on the melting of their sustaining blocks over the surface of what became afterwards the downs of Wiltshire. To our minds the theory (like many others), if admissible, only puts off the day of reckoning. If carried by ice the stones must have come from some original quarry or mountain face, no less certainly than if transported by human or by gigantic labour; so that, in fact, the geological explanation only added a second difficulty to the first. How they came was, no doubt, a question; but it was one which it would be more convenient to discuss when we knew whence they came. Nor could the ice-transportation theory throw any light on the distribution of the sarsen blocks, in some places on the highest parts of the downs, and in some (as near the Devil's Den), in lines and cross lines, that bear the strongest resemblance to the plan of a town.

A professional visit to Bristol, however, recently shed some light on the matter, by showing the "sarsen stone" used in the construction of a comparatively recent, and very magnificent, warehouse in the very heart of that ancient city, and at the side of the dock. Unmistakably there is to be seen the same stone of which the wandering "sarsens," as well as the gigantic circles of the ancient sacred capitals of the district, consist, a millstone grit (we venture to think), as superior to granite for building purposes as granite is to ordinary sandstone. The building in which we found it is called the Counterslip warehouse, and was erected as a sugar refinery, with a prodigality of cost, and an excellence of workmanship, which it is rare,—as far as we know, unexampled,—to find out of a Government dockyard, or the like locality. Four substantial floors are supported on iron pillars. There are chimneys on which experiments, such as those recently cited in our columns, might be satisfactorily repeated. And throughout is the trace of the sound workman unstinted as to cost, so that his work is what it ought to be. And here, as quoins and lintels, we recognised the sarsen stone.

For any student who has the opportunity to undertake an excursion that might associate his name with one of the most interesting problems that regard prehistoric England, here is a good opportunity. Let him trace the quarries whence the stone for this refinery was brought. It cannot be an impossible, nor, we should think, a very difficult, task. Bounding our own observation to what could be seen from railway, road, river, or tramway, we saw fine outcrops of stone, which we will not venture on such slight acquaintance to identify with this stone, but from which it did not seem unlikely that blocks as large as those of the Avebury *cella*, 18 ft. square, and 2 ft. or 18 in. thick, might have been procured. At all events, this is the vicinity in which the stone exists. That is one step, and, we venture to think, an important one. And whatever may have been the means of transport commanded by the ancient builders, a degree of strong human interest attaches to the fact that it is not necessary to have recourse to the services of imaginary icebergs as carriers from Norway, or from the mountains of the moon. Those who could build Stonehenge and Avebury,—and our own opinion has been before expressed that they were masons, and that the great stones were wrought,—could have found means of transporting their materials from the mouth of the Avon, which probably was a much better or, at all events, a much fuller, waterway in their time than it is at present.

Not that we would speak with any disrespect of the navigation of the river Avon, as it is at the present moment. Its seven locks are of the noble dimensions of 108 ft. long, and 18 ft. 6 in. wide, with an average fall of 9 ft. And Avonmouth Dock, which is called the Bristol Port and Channel Dock, is certainly one of the finest in this or in any other country. It is 1,400 ft. long by 500 ft. wide, affording about 16 acres of water. Its entrance into the Severn, close to the King's Road, is by a lock 454 ft. in length and 70 ft. in width; and the depth of water over the sill of the lock, in equinoctial spring tides, is 42 ft. At ordinary springs the depth is 38 ft., and at ordinary neaps 26 ft. The retention of a mass of water of this height by a single pair of gates of 70 ft. opening is an achievement of which the engineer, Mr. Brunlees, may be justly proud,—no less than of the perfect ease with which, on the moving of a lever, and with a preliminary subterranean rumble of loose chain, the great gates slowly roll back, with the apparent ease of a drawing-room door.

The dock is in connexion with the inland railways by means of branches to the Great Western and the Midland lines. But it is more likely to attract attention as being the English Port Said which has been selected as the base for the great campaign for the free opening of our waterways. The enterprising directors of the dock are putting themselves at the head of a movement for restoring the activity of that noble system of water-carriage which, linking together the Severn, the Thames, the Trent, and the Mersey, was the original basis of the great prosperity of English manufacture and commerce at the beginning of the century. We are not about to imitate a well-known example, and endeavour to measure how far this prosperity was due to one cause, and how far to another. Among the names of what we may call the great physical benefactors of the human race the palm may, perhaps, be accorded (with a reserve in honour of Jenner) to James Watt. But even the invention of Watt would have done comparatively little for us, without the aid of Brindley and of Arkwright. All concurred. The steam-engine enabled man to use heat instead of manual or animal labour, and this was, indeed, the mother invention. But the inventor of machinery set the mighty, though beneficent, demon thus raised to execute a work more profitable, if less interminable, than that of twisting ropes out of the sand of the Solway. And Watt's pistons, and Arkwright's spinning jennies, would have had but a restricted field for their activity but for the opening afforded for the transport of their produce by that which always has been, and always must be, the cheapest of communications,—the waterways.

It should be remembered, alike by those who would attribute the chief influence on national prosperity to legislation, and by those who would attribute it to railways, that our first spring, and, indeed, our most rapid proportional advance, was made before any one had dreamed of either "liberating legislation" or locomotion at sixty miles an hour. The first source, condition, and measure of national increase in wealth and productive energy, is the increase of population. It was in 1737 that the Royal assent was given to the first Act of Parliament for the Construction of the Bridgwater Canal. This Act was followed by successive Acts for the same work, in 1759, 1760, 1762, 1766, and 1795; and the completion of the canal, at the cost of upwards of 220,000*l.*, out of the private means of Francis, Duke of Bridgwater, was perhaps, in its consequences, the most splendid

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gift with which any Englishman ever endowed his country. True, it brought in to the Duke a revenue of 130,000*l.* a year; and did he not deserve it? He ran near the verge of beggary in proving his faith in the genius of Brindley, and meet was the recompense. We wish his mantle would fall at this moment on the shoulders of a worthy successor, for the work has to be done anew. Not done, be it remarked, under the disadvantage of fear of failure, but under opposition acting from the fear of success. It is no longer a question whether a canal is not the necessary attendant on the factory, or whether its service can be replaced, at equally low cost, by any other method of transport. But it is a question how far those who have embarked large sums of money in another series of noble enterprises, which, rightly viewed, ought no more to be regarded as competing with canals than the navy as competing with the army, shall be allowed, alike to their own loss and to that of the country, to lay greedy fingers on a traffic which can be carried on by canals at a profit at less cost than by railways at a heavy loss.

By 1737, according to careful abstract of our legislation as to canals, made by the Freiherr von Weber, in his book, "Die Wasserstrassen Nord-Europas," thirty-eight Acts of Parliament had been passed for the regulation of our inland river navigation; the earliest of which, in 1423, *temp.* Henry VI., related to the Thames. By the close of the eighteenth century the number of such Acts amounted to 116, many of which were for the construction of canals. Here was the base which fed the increase of our population, from 1800 to 1840, at the rate of 66 per cent. for the whole period, or a little over 1¼ per cent. per annum, a growth altogether without precedent before the establishment of inland navigation, and greatly diminished since its recent discouragement.

The year 1840 is one which may well be taken as a turning-point, not only from convenience of calculation, but as marking a time when canals were at their zenith, not yet strangled by the railway companies, and when the latter were also at their best, and on the road to the ten per cent. dividends which they obtained before they meddled with the canals. The average passenger and goods receipts on the London and Birmingham Railway for 1840, '41, and '42, were 789,652*l.* per annum; the working expenses were 222,879*l.*,—less than 30 per cent. The first direct attempt on the part of a railway company to obtain possession of a canal was in 1845, and by that year the London and Birmingham Railway divided ten per cent. on its original shares. The fatal work of canal acquisition, unchecked by Parliament, though admittedly in defiance of public policy, rapidly proceeded. In 1845 railways acquired control over five canals, in 1846 over ten, in 1847 over seven, in 1848 over three,—the twenty-five canals in question being the very keys of the through navigation of the country. And it is matter for serious inquiry how far that collapse of industry which we have been accustomed to refer to the "Railway Mania" of 1845 has been caused or exaggerated by the mischievous policy adopted with regard to canals; mischievous in two ways,—first as murder, and secondly as suicide,—first as blocking from the canals the traffic which they could carry cheaply at a fair profit, secondly as throwing on the rail a traffic which it costs three times as much to transport by rail as by water. Let it be noted, moreover, that as soon as a railway attains a fair amount of trade, every slow cheap train displaces at least three quick and lucrative trains. At all events, the concurrence of the two conditions of activity in canals and of increase in prosperity is indisputable. Railway dividends have declined in proportion to the extension of the mineral traffic on trunk lines. The canals, which formerly paid 20, 30, and, in one well-known instance, 128 per cent. per annum, are reduced to comparative penury; and the country is doubly the sufferer,—first by the loss of this great item of natural wealth, and secondly by the high rates of transport imposed on all places to which there is no water competition.

However we measure the increase of the national wealth, it is certain that it has undergone a very material check since the seizure of the canals by the railway companies. From 1800 to 1840 the increase of population in the United Kingdom was 66 per cent. From 1840 to 1880, it was only 30 per cent., or at less than half the rate attained during the canal period. From 1800 to 1854 (we are obliged to take the closest dates given in the returns of the Board of Trade), the yield of our coal mines, which measures the activity of our steam power, was multiplied by six and a half, being an increase at the rate of a little over 3½ per cent. per annum, year after year. This rate continued unchanged to 1872, since which it has sunk to 2 per cent. per annum, or three-sevenths of the former rate. From 1800 to 1840, during the canal period, the tonnage of vessels cleared outwards from our ports increased at the average, and enormous, rate of 8 per cent. per annum,—year by year, note!—for forty years. From 1840 to 1872, the increase has been 4¾ per cent. per annum, and from 1872 to 1880 only 4 per cent. And in 1881 there was a decline of 786,000 tons from 1880. Without attributing this altogether to the stoppage of canal transport, there can be little doubt that this was one of the causes of the decline. And the decline from 1872 to 1880 of 34 per cent. in our cotton exports, of 46 per cent. in our wool exports, of 34 per cent. in our silk exports, and of 30 per cent. in our flax exports, throws a very lurid light on the policy, avowed before the Select Committee on Railways, of charging the highest available rates of freight for carriage on railways, where no water competition exists, and of carrying cheaply only where there is already a cheap sea or other water transport. The difference between the canal cost of ¼d. per ton per mile, and the lowest rate at which a railway can remuneratively carry, is enough to keep rails, castings, and every kind of heavy goods out of the market, and is the reason for that migration of our industries to the seaboard and the valleys of the navigable rivers, of which we have recently given such striking examples.

It is thus with extraordinary interest that Manchester, Wolverhampton, Birmingham, and other great inland centres of industry will watch, and no doubt will aid, the movement now set on foot in Bristol for restoring to the inland districts that free water communication which nothing can rival in cheapness and in convenience. It is a curious remark,—and in making it we desire to acknowledge fully the immense benefit conferred on the world by the introduction of railways,—that in two signal instances among our first great railways the children have shown strong parricidal instincts. Manchester made the first English railway, and Manchester is now so barred from the sea by what, in the language of Mr. Peter Spence, she calls the "Railway Ring," which charges 7s. 6d. for transport that can be effected by common road for 6s., and by canal for 1s., that she contemplates bringing the sea inland, and probably will carry out the bold intention. Bristol was the cradle of one of the most magnificent works that ever sprang from a human brain, the Great Western Railway as designed by Brunel. And Bristol, according to the evidence of Mr. Wills before the Railway Rates Committee of the present year,—evidence that every one should read,—appears to be the object of what he considers a spiteful persecution by the Great Western Railway Company. That such is intentionally the case we do not believe. But that a portentous blunder underlies the policy of carrying cheaply only where there is competition, and charging as much as possible everywhere else, we have not the slightest doubt. Nor have we any more doubt that the adoption of a sound mercantile policy, based on a scientific analysis of full debtor and creditor accounts, such as that established by Mr. Rae, and his successor Mr. Goodchap, on the New South Wales Railway, would enable the Great Western Company to raise its dividend to six, to eight, and probably to ten per cent.

Under these circumstances,—the truth of which it is easy for any one who will take the trouble of studying the statistical returns of the Board of Trade to verify,—we are happy to welcome and to chronicle the revival in Bristol of that sound old mercantile spirit,—bold and yet safe, lucrative and at the same time patriotic in its outcome,—which made London what it is, and which, from the days of Sir Richard Whittington, was the proud characteristic of the British merchant. We do not wish to say anything uncivil to those who have, after all, done so much for England as her railway directors. But it is impossible to deny the fact that the policy, as stated before the Committee on Railway Rates, and as defended in the columns of a contemporary by Mr. Farrar, is a purely selfish policy. Not, we observe, a policy of enlightened selfishness, for that, in the long run, respects all interests; but a policy of giving to those who have much, and of taking away from those who have little: of charging prices that do not pay to towns that have a choice of sea carriage, and of making up the loss by disproportionate charges on those towns that have no alternative but to pay. This is not our picture of the case; it is plainly, not to say cynically, avowed in the pages to which we have called attention. Now, this, if a lucrative, is not a patriotic policy. To our eyes, it is as sure to be a losing one in the end to the companies themselves as it is injurious to the country. The man, and the association, that enriches itself while serving the country, is, like the famous portraiture of Shakspeare, "twice blessed." A truly sound mercantile policy "blesses him that takes and him that gives." A policy that is founded on ill-advised competition must be, to speak out honestly, a policy of extortion, and we believe that its natural result is ruin.

It is a remarkable proof of the depth to which the sense of the importance of securing the cheapest mode of transport has penetrated the manufacturing and mercantile classes of society in England, that we see, at the same moment, in two such different localities, Manchester stretching her hands towards the sea, and Bristol preparing to push her water transport into the heart of the Midland district. Bristol, once the second port in England, is now the eleventh in the order of her tonnage. Will she ever regain her former pre-eminence? More unlikely things have occurred. It is not attempting to prophesy to say that that port, or that city, which adopts and enforces the sound principles of true mercantile policy which have made England what she is, will thrive and grow, while those cities and ports that hug themselves on a selfish and short-sighted policy will dwindle and decline. As to command of coal,—the mainspring of industry,—Bristol is no whit behind hand with Liverpool. The imports and exports of the latter port amounted, in 1880, to 191¼ millions sterling, those of London itself being only 194 millions. Bristol comes after with only 10 millions sterling of trade. But during the last twenty years, while the shipping of Liverpool has increased by 59 per cent., that of the Tyne has increased by 85 per cent., and that of the Clyde by 103 per cent. Is there not a warning in these figures? Proud, and justly proud, of her quasi-metropolitan dignity, Liverpool seems to have forgotten that a port must have two legs to stand upon. Her command of maritime trade, except for purposes of call and of re-shipping, can do her little service unless she has equal command of the free channels of internal traffic. It is of no use to receive food unless it be distributed through the system. The facts which have been recently brought to light as to inland transport from Liverpool are of extreme gravity. Whether as large holders of railway property, or as a great corporate body, the merchants of Liverpool have the deepest interest in being able to send their imports into, and to receive their exports from, inland Lancashire and Yorkshire by the cheapest possible route. How far this has been lost sight of we have seen. Manchester now meditates a blow, which, if delivered, will deprive Liverpool at one stride of half her wealth. And Manchester, it is only fair to say, only meditates this blow as a measure of long-suffering and long-provoked self-defence. We have before expressed the opinion that, on general grounds, the location of ports on the seaboard, with canal communication for heavy, and railway communication for light, inland traffic, is the true mode of developing to her utmost the natural resources of a country. The recent decision of the Provisional Committee shows that they have given full attention to the considerations we suggested (vol. xlii., p. 763, and vol. xliii., p. 58). But if the port neglects, or even aids, in choking up her inland outlets, the case is widely altered. Mr. James W. Harvey, in a letter to the *Manchester Guardian* of the 11th current, calls attention to some serious difficulties (apart from those caused by the railway companies) in the way of an adequate canal service between Liverpool and Manchester. His arguments have great weight. If Liverpool only cares to increase her dues, and neglects to keep open her inland outlets; if the combined five railways and two canals between Manchester and Liverpool, instead of emulating one another in the cheapness and convenience

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with which they can supply the great centre of consumption, Manchester, from her present great centre of maritime income and outlet, Liverpool, only combine to keep up extortionate rates, neither Liverpool nor the railways will prevent Manchester from turning herself into a seaport. The engineering science of the day can overcome what is the true difficulty in this case,—the construction of low-level docks at an enormous cost. For the difficulties of navigation to Manchester, they reduce themselves to one,—that of the purse; and at that, unless we are mistaken, Manchester can afford to laugh.

France and the United States are rivalling one another in the enormous sums which they are expending in perfecting their inland navigation. And the reason is, that men of business, in France and in the United States, have quietly put to themselves the question, "How shall we secure the cheapest possible inland transport? Through Belgium extends a network of 1,250 miles of inland waterway, the dues on which are not more than enough to maintain the safety of the canals. To that we must come in England, if English manufacture is to hold its own in competition with that of countries provided with free inland water carriage. Manchester regards, and wisely regards, her own need in this respect. Bristol, looking at the need of the inland district, will enrich herself in supplying that need. But all England is interested in the possession of a free inland water communication,—costless, except for its own maintenance. And it is our opinion that those localities which first bestir themselves towards attaining this great national desideratum will be the first participants in the wealth which they will thus aid the nation to acquire.

WANTED! AN OPERA HOUSE.

IT is a strange enough fact, not perhaps quite easy to fully account for, but a certain one, that there is, in so vast a city as London, filled as it is with all that the highest civilisation can afford, but one opera-house. True it is that efforts have been occasionally made to add another to this one; but, as it would seem, only to fail. How this is, with so very many theatres round and about us, it might be hard to say, for so many considerations crowd on us in the endeavour to account for it. That it is a fact is certain. And not only is this so, however to be accounted for, but the "season" for the one only is for so short a time, a few weeks only, that there is but small,—if, indeed, any,—chance of even the upper world of London seeing or listening to many of the most famous of the great compositions of the gifted few who have had it in them to write those unique works. A rare combination of faculties and endowments would seem to be needed to write an opera, and to bring so much of that which is purely mental and musical thought and inventiveness to what may almost be termed a practical purpose. The men and women in an opera must needs talk and act for a time in music, and the very music itself must tell the story of what is going on, and how. Operas are thus quite apart from the usual "stage" business, as visible and listened to in "plays."

Operas and operatic performances being so exceptional, and demanding so much in those who invent, and in those who realise them to the public ear and eye, it would seem that no amount of cost and art-thought would or could be well spared in providing a due and proper place for the representation and rendering of a fine opera. In listening to so magnificent a creation as the "Don Giovanni" of Mozart, or the "Fidelio" of Beethoven, all must needs feel, who at all care for such things, that it would be impossible to over-estimate them, or to wonder too much at them, or at the powers displayed by their authors in the planning of them, and in the working out of their details. The subject is a very complicated one, and we can here touch on but one or two aspects of it which seem to us to call for more especial attention, and which, if thoughtfully taken into consideration by those who have the management of such things, might, as we cannot but think, do some service. Operas are artistic works, and call for not a little from artists of many kinds and degrees of power. Nothing, perhaps, in the whole range of art demands more: there is the author of the libretto, the composer of the music, the actors and singers, and the instrumentalists, and what most concerns us here, the house in which the performance takes place; and the scene-painter, and we can but add it,—for he has, as things are, not a little to do,—the artist who should regulate the lighting of both house and stage.

We have been led to some thoughts on operas and operatic performances and requirements, from contrasting the music of the "Don" with the place in which it is now necessarily given to the world, and in the hope of in time seeing a something better provided. It would, perhaps, be difficult to contrive a place less happily adapted than the present Covent Garden Theatre for such a purpose as this of opera music. We go to hear, as well as to see; to hear, more especially and emphatically, and also so to hear and see that nothing shall distract the attention of either eye or ear from the stage and music. But how are matters here? In all theatres we are looking at the stage, and not at the house, yet at Covent Garden so brilliant is the light from the huge and ungainly chandelier of glass suspended from the roof that it all but hides the stage from those who otherwise can but see it, but are supposed to see the stage uninterruptedly from the gallery and the gallery stalls and even upper boxes. This may, perhaps, have been unnoticed by those who can so readily mend such matters; and we can but hope it will be, for we do not hesitate to say that very much is and must needs be lost by it, even by those who witness the performance from a lower, and in many ways more, favourable point of sight. But it is to the ear that opera more particularly addresses itself, and this gains by distance, for the instrumental music is thus softened, and is made to so impress the ear as to seem to come in its unity from the conductor's *bâton*.

We may here, perhaps, usefully say a few words on this world-famous opera, the "Don Giovanni" of Mozart, and on the special way in which it is presented or not presented to the public ear and eye at Covent Garden many times during each opera season, and on the scenery and the special architecture which are made to do duty, and thus to aid and support the music of it; for in spite of the brilliant attractions of the house and the absorbing splendour of the music, it is impossible altogether to be blind to the scenery of this famous opera. Anything duller or less suggestive, or indeed dingier, is scarcely to be imagined. No attempt whatever would seem to be made to harmonise the different scenes, or to make them in any way suggestive of the time and place in which the action may be supposed to have taken place. Anything, indeed, in stock would seem to do for the "Don," and so bad and incongruous is it, that all sense of unity and continuity is utterly lost. It is a pity, indeed, that this is so, for one at least of the elements of opera, which no less a celebrity than Rousseau declared to be an essential, is even worse than absent. A something is in the place of it which had far better be absent altogether. A room utterly bare, or an empty vault, must be better, thus leaving the dramatic music to do the whole work and to tell of what is going on.

Mozart composed this greatest of operas in 1787, for, as he said, "himself and his friends." It found its way into England in 1817, when we are assured that it was performed in a way that has not since been equalled. And we thus allude to it in the hope that effort will in time be made,—shall it be in the next year?—to improve a little on what is now done. We dare not go into details, but it is hardly to be estimated how great is the art loss, and perhaps must needs be when no architect, or even upholsterer, has been consulted as to the unity and fitness of the scenic details, and no painter's eye has been brought to bear on the glare of the house, putting out, as it needs must, the very stage itself, its scenery, and the action on it. The very "constituents" of opera are, according to the great authority we have just quoted, the poem, the music, and the "decorations," or scenery, and to those we would venture to add the place, or "house," in which all goes on, and its fitness for its special purposes, and perhaps, we are disposed to think, as much as anything the method of its lighting. On the poor way in which this is now managed at Covent Garden nought need be said, further than this,—that it could hardly be more destructive of all scenic and pictorial and dramatic effect. The purpose of the "decorations" is to provide fitting objects for the eye to dwell on, and to aid the dramatic effect, and thus to add to, and not to mar, the work of the music.

We would fain say a word on the music of this great opera and on the singular fact, for fact it is, that but for the "Italian opera," as it is termed, there would needs be a vast gap and a want which it would, as we can but feel, be impossible to fill up. We speak of the fine instrumental band which, but for it, would hardly have existence either in numbers or quality. Right well does it do its work, and would do yet better if the house were better or at all adapted for such work, and how worthy of all effort and painstaking the rendering this music of "Don Giovanni" is none need to be ever reminded. That the illustrious composer was at his best, and was indeed inspired, when he wrote it, is certain. Its glorious and ethereal tones never pause or flag for a moment from beginning to final ending; from the first bar of the overture to the last note, as from the abode of the lost, there is nothing wanting. It is all but perfect work, and is on a level, as a work of the very highest art, with the "Hamlet" of dramatic art, and the music of it is so essentially dramatic that it takes the place of words in power of description. Such a work evidences the power of sound, as it does the wonderful inventive powers of its author. It is worth a house built of real and solid materials, thus to add to the power of the band and voices, and to their interpretation of so magnificent an art-thought.

WHAT ARE THE PROPER LIMITS OF CONSERVATISM IN REGARD TO ANCIENT BUILDINGS?*

WE live in an age of what are sometimes called "movements." We can all particularise a considerable number of such movements in the regions of politics, theology, and social life. We have had the reform movement, the evangelical movement, the ritualistic movement, and the women's rights movement, and other smaller intellectual and social upheavals of the same kind. The world of art has conspicuously shared in this general tendency of the mind of the day. Five-and-twenty years ago lovers of painting were scared by the pre-Raffaellite movement; more recently lovers of music have been scared by the Wagner movement. Almost all such movements have two characteristics in common. They are almost always taken up by a large number of persons who know not why they give their adherence to the particular standard set up, but who follow a fashion, without logic or reason, because it is a fashion, and because they are gaping for novelty; and all of them tend (more especially in art and literature) to give rise to a counter movement, a swing of the pendulum in the opposite direction.

If we keep our eyes open to this general tendency of the day, we shall probably conclude that the particular movement we are considering this morning is not an abnormal phenomenon, but is only one example of the prevalence of rapidly-changing fashions which is to be observed in the world of art as much as in that of politics and of society, and has the usual characteristic of movements arising out of fashion,—viz., that many persons follow it without knowing why. Numbers of people are at present exceedingly excited about, or rather against, the restoration of ancient buildings; but it may be doubted whether nine-tenths of them have ever seriously considered the subject, or are even acquainted with the main facts of architectural history; and the vehemence of opinion entertained and expressed in the matter seems, as far as my observation has gone, to be usually in inverse proportion to the knowledge of the subject on the part of the anti-restoration zealot. And, as in the case of other movements, this somewhat extravagant zeal is the result in great measure of a reaction against an opposite extreme. Let us see if we can get at the balance of truth between the contending parties.

The movement against which we are now "re-acting," the restoration movement, did not grow up alone; it was closely connected with, if it did not actually arise out of, the High Church movement. With the idea that a new life was to be infused into the Church by a revival of pre-reformation theology and ceremony, came naturally the idea that the buildings also should be revived, that they should be raised from the state of neglect and disfigurement

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into which many of them had certainly fallen, and that where possible they should be restored to something of their ancient beauty. The Ecclesiological Society, under the motto, *Donec Templa refecimus*, gave the cue, and the restoring of churches became one of the watchwords of educated society; and he who admired unrestored churches, or who objected to giving his mite towards restoring them, would have been called a "Philistine," had that expression been in common use in this country at the time. How church committees and architects acted under this *régime* we all know; how they swept away galleries, laid down Minton's tiles, and inserted Mediæval metal work from Southampton-street; and how they recased the exterior with new stone, scraped the old stone, imitated the old mouldings where decay had gone too far for scraping up; put in stained glass "by the most eminent firms," and made the whole as good as new. By such proceedings were deans and committees covered with glory, and architects' pockets filled with bank notes. The reverse of fortune began when first a few people, and then an increasing number, began to find out that some of the artistic significance and a good deal of historical value was eliminated from churches that had been restored; that the new work, however carefully worked in accordance with the old details, was not like old work in one sense,—had not the same feeling, was not interesting to sketch; and that it was too like old in another sense, seeing that to future generations it might remain somewhat difficult, after time should have reduced old and restored work to much the same texture, to say which was the genuine Mediæval Gothic and which the nineteenth-century imitation. This negative feeling against restoration seems to have been strengthened at the same time by a positive feeling in favour of much work which the Mediæval restorers had swept away as uninteresting and "Pagan." The revived Gothic being only an imitation art after all, palled on people after a time, and they got up another imitation,—that of eighteenth-century architecture,—as a change; and thus the old pews and galleries which the Gothic restorers had made conscience of clearing away, came now to be regarded reverentially as objects of artistic as well as of historic interest. Lastly, the reactionary party having come to the conclusion that there was and could be no real architecture in the present day, the impulse and spirit of architectural art being dead (a conclusion which it must be admitted many of the buildings in the now fashionable style amply justify), laid it down that it was an artistic crime to meddle with, alter, or add to any existing building, or part of a building, in any way; that "whatever is, is right," to the extent, at least, that whatever has been put up for a certain number of decades (not quite defined yet), however ugly, inconvenient, or useless for present needs it may be, has, by its mere existence, acquired a right to remain; that no one ought to touch a stone or a timber of an old building in the way of destruction; that to attempt to restore that which has wholly or partially decayed is a foolish and wicked sham, since no work done in this century can really reproduce the spirit of a former period; that the only right thing to do with any old building, however large and important, is to prop it up as long as possible with brickwork and shores, and reverently to contemplate its decay; and, generally, that any one who would take any other and more active course must be either a hopeless Philistine or an unprincipled person inspired by the worship of "Five per Cent." Society, to a great extent, has, for the present, taken up this way of looking at the matter, as the last novelty in taste; and thus we have the absurd contrast that, while five-and-twenty years ago it was considered a mark of stupidity, and of being below the level of average culture, to be indifferent to the restoring of old buildings, it is now supposed that to be a restorer or an advocate of restoration is an indubitable mark both of stupidity and vulgarity.

That seems to be about the creed of the anti-restorer of the day, as expressed in an often very defiant manner, through the mouth of its representative Society and its supporters in the press, some of the latter of whom carry on their attacks against any architect who may have ventured to pull down a dilapidated and useless building, with a rancour and an apparent disregard for common fairness which are very discreditable. We might, if we liked, amuse ourselves by picturing the aspect which one of our churches or cathedrals would have assumed by this time, had it been left to the custody of the anti-restorers; what a picture its interior would present, filled with all the heterogeneous furniture which different churchwardens at different dates had placed there; its roof-timbers bandaged with iron and propped in places from the floor, and the crown of an arch, which had hopelessly settled, held up by a brick column built up under it,—"reverently," of course. But the first thing to say in the way of serious criticism, in regard to this theory of the treatment of old buildings, is this, that it is something absolutely novel, it is the assumption of a principle which has never been recognised or acted upon in the whole previous course of the history of architecture. In every period hitherto men have not hesitated to sweep away a building which was in their way, which they did not want, or on which they thought they could improve. Had the Mediæval architects not done so, many of the most beautiful specimens of Mediæval architecture would never have come into existence. There is hardly a cathedral in England parts of which do not stand on the foundations of an earlier building, pulled down without scruple because the later builders preferred to build in their own style. William of Wykeham, one of the most honoured among the few names that are known in connexion with Mediæval architecture, did perhaps more wickedly than this, for he cased the whole Norman nave of Winchester with work in the style of his own day. Had the "Anti-Scrape" Society been in existence then, William of Wykeham would almost have been hounded out of the country; the *Times* would have been filled with letters about his enormities; no name would have been bad enough for him. The reply to such an instance will probably be, that we have no architectural impulse now, no power of building well. Those who assert this so strongly probably know their own deficiencies, but they might at least be content to speak for themselves. It is certain that this age is not pre-eminently an architectural age, as the thirteenth century was; it is pre-eminently a scientific age; science is its peculiar mission. But that therefore no original architecture worth having is in any way possible, is a rash and somewhat pusillanimous conclusion. At all events, it is quite certain that we shall not produce any by propping up old buildings and watching them with our hands folded; and it might, perhaps, be suggested that if as much trouble and energy were expended in applying the mind to the problems of modern architecture as in mourning over ancient remains, our present condition might be better than it is.

It is, however, equally true that restoration, as it has been recently practised among us, is also a system almost entirely modern and unknown to former epochs of architecture, for the very reason that its opposite, the superstitious veneration of old buildings because they were old, was also unknown. At any period previously to the present century, when a building or a portion of a building was dilapidated, the natural course was to pull it down and to build a new and better one, or what the new builders fully believed to be a better one. The builders of the Mediæval cathedrals appear to have done this with as little hesitation, and as little doubt that they were doing the right thing, as a modern engineer would feel in regard to pulling down an old viaduct or station and replacing it with one more ample and more scientifically constructed; and even the Georgian architects, who placed a Classic pedimented reredos in front of an old Mediæval one, had not the slightest doubt that they were improving the architectural appearance of the building. The result in regard to the Mediæval buildings has been that most of our cathedrals form an agglomeration, highly picturesque and historically significant, of various styles, each portion expressing the taste and artistic power of the generation which built it; and that, on the same principle exactly, Westminster Abbey has been crowded with monuments in a style utterly alien from that of the building, but nevertheless carried out in perfect good faith by the men who designed them, and which the late Dean of Westminster regarded as a most interesting exemplification of the modern spirit in art, "awkwardly struggling into life." We can realise better the distinction between either of the other two methods we are considering, by endeavouring to imagine for a moment what would have been the aspect of our cathedrals if either of the two systems, the restoration system or the let-alone system, had been systematically applied to them, since the Norman foundation (leaving Saxon foundations out of question for the moment). On the restoration system we should now have a considerable number of buildings in the Norman style throughout, a large proportion of which would be probably imitation of Norman work made in the fourteenth or fifteenth century, when the buildings would have begun to require repair, and perhaps further imitation of those imitations made in the eighteenth or nineteenth century. If the let-alone method had been used, we should now have the remains of a set of Norman cathedrals, all genuine work as far as they were left, but with the details nearly obliterated in many places, and the walls upheld by shores, brick piers, and iron bandages, where the foundations had given or the masonry had otherwise failed; and as the Norman buildings were mostly timber-roofed, they would nearly all be roofless. On the whole, the restoration method would have the best of it, as the buildings would at least be available for practical use, which, after all, is one object of a building.

It is this latter fact which seems to be entirely forgotten by the excited opponents of all restoration whatsoever. The mistake which the anti-restoration zealots make is in regarding buildings solely from the point of view of their historical interest. There are, in fact, three different ways of regarding an ancient building, three different values which may attach to it, viz., its historical interest, its architectural beauty, and its practical utility; and it depends upon the relative preponderance of these values in any particular case, which we should adopt of the three possible courses, that of restoration, of removal, or of mere preservation in its existing state. We are speaking, of course, of buildings which have become more or less dilapidated, so that the question is necessarily raised as to what should be done with them. It appears to me that there is only one class of ancient structures to which the doctrine of anti-restoration in its purity can be applied; those, namely, which are already what are usually classed as "ruins," partial remains of structures, all practical usage of which has long been discontinued. These are almost certain to have historical value, and in many cases they have also high artistic value from the remains of beautiful architectural detail which they present. To restore the missing portions of such buildings would only be to add the imitation to the reality, the false to the true; it could add nothing to their value in any way, but rather detract from it: the one thing to do in such a case is to preserve them as carefully as possible, so long as their preservation does not interfere with really serious present interests, which is a possible though a very exceptional case. But the problem is not by any means so simple when we have to deal with a building which is in the main complete, and which is in present practical occupation.

It seems to be necessary to remind people nowadays that architecture is not *only* a form of historical record, but also a form of artistic design; and that the more complete and homogeneous such a design has been originally, the more it will be rendered imperfect by the delay and loss of any of its parts or details. When a building is in that state that a great portion of its mouldings and other details are worn away, I am unable to see why it should be an act of vandalism to replace these by new details following the indications left by the old ones. There need be no pretence made that they are old works; they are simply the repair and reconstruction of features necessary to the architectural expression of the whole, and which had become worn out, although the main portion of the building may be solid enough to last a long time. To say that they cannot have the precise look and surface of the old work, is quite true; why should they? Let them appear as what they are, the necessary restoration of details essential to the architectural ordinance of the building, and which had unavoidably perished in course of time. I would draw a line between purely architectural detail, however, and such additions as figure subjects in sculpture and mosaic. Those are not part of the architectural design, but separate designs added to or framed in the architecture, the value and expression of which depends entirely on the "personal equation," so to speak, of the individual artist. If these are so

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far decayed that little or nothing can be made out of them, and that they have ceased to be artistic adornments to the building, let them be, if possible, preserved in a museum, and their places filled up with work of a similar class, not imitative, but representing the best ideas and work of modern artists, unless it be preferred to leave their places vacant. But purely architectural details, which all have a relation to the whole, and are chiefly valuable through that relation, stand on a different footing. Take such an instance as that of a series of traceried windows, of which the greater part of the tracery has decayed, but enough is left to show the original design,—why are such windows to be left melancholy, broken, and dilapidated? To object to their restoration is to be at variance both with architectural fitness and with common sense; to restore them is to restore the originally contemplated architectural design of the whole: and the same reasoning holds good in many similar instances.* Again, there are cases in which the interior of a Mediæval building, let us say, has been utterly spoiled by the insertion of totally incongruous and badly designed accessories, such as the pews, galleries, and Classic reredoses of what may be called the "churchwarden era." When the ecclesiological movement began, there was a greatly-exaggerated depreciation of everything that was not Mediæval, and all relics of the "Pagan" Renaissance were to be trampled under foot. This, of course, was absurd. But equally absurd is the new idea, that all the preposterous lumber that may have been put into a church is to be left there for ever, because it was once ignorantly put there. A good Mediæval building is an illustration of a special architectural style consistently carried out. Even good work in the Renaissance style is at variance with the artistic feeling of a Gothic building, and had much better be removed, if a good and more suitable use can be found for it elsewhere. But the feeling of the modern zealot does not stop at what is good. He would have us religiously retain an ugly and unnecessary gallery, a hideous quasi-Classic reredos, which are absolute blots on the main architectural design of the building, because some blockheads put them there a century ago. Had the said zealot and his Society been in existence then, they must, on their own principles, have protested vehemently against these additions to the building as acts of vandalism. If any one will give me any logical reason why an addition, which was vulgar and tasteless when it was made, should become an object of enthusiasm because it has been there for a hundred years, I shall be very glad to hear it.

This latter point is partly connected also with the practical view of the subject, as regards buildings which are in present occupation. That our cathedrals and churches are buildings in present occupation is a fact which seems by some people to be entirely forgotten. If it is to be laid down that those using the churches are never to repair or re-furnish them, never to clean away whitewash and cobwebs, or to lay down a new tiled floor, I suppose the same argument applies to old houses, and that the man who has the misfortune to live in an old Elizabethan house has no right to have his rooms repainted or re-decorated, or to have any new furniture of any kind, on pain of æsthetic damnation. If it be true that cleanliness is very closely connected with godliness, it might be supposed that even on that ground it was on the whole a pious work to clean and scrape and redecorate the interior of a church or a cathedral occasionally. To my perhaps perverted mind it seems that even architectural effect is aided by an aspect of cleanliness and renewal of interiors at least. I have read in the æsthetic papers lamentable outcries over the spoliation of Tewkesbury Abbey by restoration. I first saw Tewkesbury when the interior restoration was half finished, down to the first bay of the nave, and a screen divided the restored from the unrestored part. There was some coarse and glaring gilding introduced on the bosses of the vaulting, the effect of which was vulgar and over-prominent; but with that exception, the restoration chiefly consisted in scraping off whitewash dingy with the dirt of years, and cleaning the whole thing up generally. On the western side of the screen were dirt, whitewash, and general untidiness, on the eastern side cleanliness and order and repair; and if any one had seriously told me that the architectural effect of the restored portion had been injured by the change, I should have regarded him as a person too silly to be worth arguing with.

In connexion with the practical part of the subject comes the question of the stability of an edifice which is in use. Upon this head the scepticism of the new æsthetic party is most remarkable. No representations will induce them to believe that a building is really too rickety and dilapidated to do any good with. It is all the malice of the architect, who wants to have a commission to build a new one. It is desirable that the general public should be decisively warned against believing all the assertions which are made in such cases, often by people who have absolutely no means of judging of the truth at all. Let me put on record one example about which I happen to know something. There was a furious paper warfare some time since about the proposal to put a new roof on the nave of St. Alban's Abbey. The proposal was denounced by members of the anti-restoration party, who had never seen the roof for themselves, as absolutely scandalous; they had been assured on good authority that it was perfectly possible to repair the existing roof, &c. I was one of those who did see the said roof, which was in such a condition that the wonder was that it had clung there so long, and that it had not been down in the church long before. Then there was a solemn appeal made in one of the papers (the *Athenæum*, I think) about the painted ceiling of the nave, or rather an expression of incredulity that any one could dream of touching *that*, as if it were a sort of sacred thing. Now there is one portion of painted ceiling at St. Alban's which is good and original Mediæval work; but the ceiling of the nave aforesaid was what appeared to be a bad and rough imitation of the general effect of the older part; it was a design of the most commonplace character, such as an architect's pupil might make the first time he got a pair of compasses and a paint-box in his hand, and it was roughly painted in black and red on wood little thicker than a band-box, and so rotten that you could almost crumble it in your fingers. And I think any one who had first read the outcry in the papers about this roof, and then gone up the ladders and looked at it, would have made the same memorandum that I did, not to believe everything that he was told about the stupidity and vandalism of restoring architects.* The latter have, no doubt, done some things they should not have done; but I venture to think that in nine cases out of ten they know better what they are about in these matters, and can better judge how to reconcile the claims of archæology with those of practical architecture, than their very pertinacious instructors of the anti-restoration clique can teach them.

This very strong and exaggerated feeling about touching ancient buildings, even in the way of reasonable repair and refurnishing, which has made itself heard lately, is only one form of a prevalent false note in the life of to-day, consisting in a disbelief in and discontent with everything in the present, a continual sentimental yearning over the life of the past, or after some impossible æsthetic millennium of the future. Nothing done to-day is good; everything good was done a long time ago; and, conversely, everything that was done a long time ago was good. This unwholesome sentimentalism has affected the judgment of many persons in regard to all the artistic side of life, as well as in regard to social conditions; and one form which it takes is this exaggerated worship of old buildings, quite irrespective of the merits or defects which a calm critical judgment might see in them; the natural conclusion from which state of mind is, that there is no limit whatever to conservatism in regard to ancient buildings; that, however dilapidated, however useless to us at present, however really bad in style they are, they must be preserved till they come down of themselves, because they are relics of the past, and we poor creatures of the present can do nothing. It is vandalism even to decorate an old building in any way; and one eminent decorative artist lately made public his determination to put no more stained glass into any old building. One cannot but respect the heart of an artist so conscientiously sticking to his principles in opposition to his own professional advantage; but this must surely be at the expense of our respect for his head. Another characteristic of this superstitious worship of old buildings is that it puts aside all questions of public convenience or public improvement, all questions of mere utility in fact, as trivial and beside the mark. Thus the outcry about the removal of one or two of the City churches in London has been more serious than the nature of the cases really warranted. It is out of the question that churches which, owing to various social changes in the locality, have fallen almost out of use, should necessarily all stand for ever, where land is so much wanted for the immediate purposes of life, because they were once put there; especially when their architectural merits are certainly in some respects over-rated. For it is one result of this over-acted conservatism that all critical judgment is subordinated to an uncritical, and what may be called a sweeping admiration for the past; otherwise it would surely be seen that Wren's churches, even where they are admirable for their plan and construction and a general largeness of style, are so in spite of much exceedingly bad and even vulgar detail. The absurdities to which this kind of superstition may lead people are notably exemplified in the statement which has been solemnly made, that the undulation in the pavement of St. Mark's at Venice was intentionally made by the builders, and constitutes one of the special beauties of the edifice. Persons who would say that would probably say anything. But those who are not entangled in this kind of sentimentalism will regard architecture as an interest of the present quite as much as of the past, and as a subject which has its practical as well as its sentimental side. They will recognise that those who are officially or professionally in charge of ancient buildings have something else to do than prop them up and watch them crumble away; that it is worth while to keep the architectural design of a building intact by occasional renovation of its details before they are worn out of all recognition; that it is no artistic desecration to clean and redecorate a building once in a century; and that where a building is actually in occupation or usage, to neglect or refuse to do this would simply be to range ourselves on the side of slovenliness, dirt, and decay, besides the evil of deliberately shutting out one means of stimulating and encouraging the artistic design and art workmanship of our own day. That is one merit which has certainly to be credited to the Gothic revival and the restorationists. They sometimes overdid restoration deplorably, and made some great mistakes which cannot now be unmade; but they did a great deal to stimulate architectural study, and to give a new life to architectural art in this country. The Gothic revival and the restoration movement constituted a kind of "craze," no doubt, and did mischief in some ways, while doing good in other ways; but the anti-restoration craze does neither evil nor good; it would avoid mistakes by doing nothing; it means architectural stagnation and death.

A Cathedral for the Isle of Man.—A meeting for the purpose of promoting the erection of a cathedral in the Isle of Man was held at Peel on the 20th inst. Bishop Hill presided. A scheme was produced for making the new parish church of Peel, now nearly complete, into a cathedral. This could be done at a cost of 2,000*l.*, but the scheme was opposed on the ground that the cathedral, to be of utility, should be established in Douglas, that being the centre of the population, and the chief resort of many thousands of visitors to the island. If, however, Douglas was chosen as the site of the proposed cathedral, the cost would not be much less than 50,000*l.* An amendment was proposed by Mr. E. C. Farrant, that an architect should be employed to report on the cost of so altering one of the existing churches in Douglas as to make it suitable for the purposes of a cathedral. This amendment was not seconded, but the bishop expressed himself in favour of a new cathedral in Douglas, if some means could be devised for raising the necessary funds.

* Since this was written, I have met with some remarks in a paper in the August number of the *Cornhill Magazine*, by the talented lady who writes under the name of "Vernon Lee," in respect to the restoration of ancient statues, which bear upon and support this view. Speaking of the case of a beautiful head of which the nose was gone, she asks whether any modern restoration of the feature could possibly be so injurious to the statue as this ghastly scar in the centre of the countenance. The same argument applies to what we may call the architectural countenance of a building.

* This must not be taken to imply any sort of satisfaction with the treatment which St. Alban's is now undergoing,—not, be it observed, at the hands of an architect.

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AN INTERNATIONAL DEBATE ON DRAINAGE.

There were no fewer than fifty-one subjects inscribed for discussion by the five sections of the International Sanitary Congress.* But of all these questions, that which attracted the most attention, elicited the greatest number of speeches, the strongest display of feeling, was the problem of dealing with the sewage of towns. The authorities of Geneva are themselves somewhat perplexed by complications in this respect that become more and more serious every day as the population and number of visitors increase. Several town architects and engineers, therefore, took an active part in the discussion, and though the section had no less than nine subjects to debate, it devoted three out of its four sittings to this one topic. The debate was opened by M. A. Durand-Claye, chief engineer of the Paris Ponts et Chaussées, professor at the École des Ponts et Chaussées and at the École des Beaux-Arts. As one of the principal authors of the irrigation farm at Gennevillier, M. Durand-Claye's eloquent and witty speech was devoted to the defence first of draining into sewers, and then of disposing of the sewage by irrigation through cultivated fields. Cesspools he justly qualified as barbaric contrivances, and proclaimed himself the uncompromising advocate of what is known in France as the principle of "*tout à l'égoût.*" The arguments in favour of this principle are so familiar in England that we need not repeat them. The real points at issue were what should be done with the sewage when collected, whether there should be a separate sewer for rain and surface water and another for sewage proper, and whether the latter should empty itself by the force of waterflow and gravitation, or by pneumatic suction.

Dr. P. Brouardel, from Paris, Professor of Forensic Medicine, delivered an earnest protest against the dangers of draining into sewers. He described the visits he had paid to the Paris sewers; how in the sewer of the Rue Montmartre he found the deposit of filth more than a foot deep, and how in this mud he had disinterred dead dogs, &c. If to such foul accumulations were added the germs of disease, an epidemic must inevitably break out. It was all a question of the germs, and in large towns the germs must sooner or later find their way to the sewer; and sewers, working so badly, apt to stagnate and collect filth, were well suited to develope the germs and spread the disease. Typhoid fever had undoubtedly been traced over and over again to the sewers, and the present epidemic in Paris was in all probability due to that same cause. During the sieges of Metz and of Paris in 1870, every condition known to favour an outbreak of typhus existed, and yet this dreaded disease did not make its appearance. At Metz, the case was more remarkable than at Paris, because there were soldiers ill of typhus fever among the Germans. Fortunately the French made no prisoners; the germs were, therefore, not introduced into the besieged city, and hence, in spite of all the predisposing circumstances, this fever did not attack the inhabitants. So in Paris, and in every large town, there were thousands of persons who, from time to time, became predisposed to certain diseases, yet these persons escape the illness if they have the good fortune not to come in contact with its specific germ. Dr. Brouardel's experience of Paris sewers, however, led him to believe that they would bring the germs to the door of every house. He therefore hesitated before approving the abolition of cesspools and the mingling in the public sewer of the dejections from every household. If, nevertheless, this was done, then the sewage should be received in pipes hermetically closed with no possibility of any sewer-gas escaping either into the street or the houses. In other words, Dr. Brouardel was evidently an advocate of the pneumatic system of drainage.

M. Émile Trélat, the eminent architect, whose name is already familiar to the English reader, at once rose to oppose the conclusion of Dr. Brouardel. He protested that the matter had now become no longer a question for doctors to decide, but for engineers and architects to debate. The doctor was no longer the operator; he now occupied the position of the patient. It had been decreed by doctors, chemists, and men of science generally, that all organic matter must be at once removed from the neighbourhood of dwellings; that if such matter remained stationary even for a few hours it might endanger public health. In a word, removal before mischief has time to arise was the solution of the problem. It was a doctor's business to arrive at this conclusion, but, in the carrying out of this principle, he was no longer a competent judge. He compared Dr. Brouardel's language to that of a patient before an operation, who insisted on examining the surgeon's instruments, criticised his mode of proceeding, and complained that he might perhaps hurt him. M. Trélat was well aware of the imperfections in the Paris sewers, but this only proved that the sewers had been badly built and must be rebuilt. In Paris matter coming from the farthest branch of the sewers should not take more than six hours to reach the outfall; and in answer to the danger of typhoid fever from sewers he would quote the statistics given at Berlin during the recent epidemic. In 1879 there was one case of typhoid fever in every sixty-five houses draining into the sewers, and one case in every seventeen houses draining into cesspools. In 1880 there was one case of typhoid in every forty-five houses connected with the sewers, and one case in every nine houses not connected.

Dr. J. Teissier was the next speaker, and he gave the details of a most interesting experiment he had made at Lyons, where cesspools are still used by most of the inhabitants. The hospital of the Charité, however, drains entirely into the sewer. In spite of this the scavengers of Lyons always prefer descending into all the parts of the sewer communicating with the hospital. They declare it is free from bad odours, and the easiest to clean. Dr. Teissier, collecting some water in this sewer, found it so clear and free from odour that any one ignoring whence it came would not have hesitated to drink it. He then proceeded to inoculate some guinea-pigs with a strong solution from a cesspool. The animals were none the worse after the operation; but the guinea-pigs inoculated with the clear water from the Charité hospital sewer died in seventy hours. Dr. Arnould, who assisted at these experiments, found microbes in all the tissues of the dead guinea-pigs; and by inoculating other guinea-pigs with the blood of the first victims, the poison in passing through various guinea-pigs became so intensified that ultimately death resulted in ten hours. The apparent cleanliness of sewer water was not, therefore, a proof of its purity. Yet he recognised that the sewer water of towns where cesspools were still maintained, contained nearly as much nitrogen as those which received the entire drainage. He also recognised the experiments made by Doctors Simon and Emmerick, which proved that human dejections, diluted and injected into animals, would not harm them if fresh, but that the same solution, even when administered in a smaller dose, would produce death if allowed to stand for a few hours. He therefore could not deny the importance of the immediate removal of sewage. But while sewage, if promptly removed, could not, as a rule, be injurious, and would not create germs of disease till it had had time to ferment, still, if it should be impregnated from the very first by specific germs coming direct from patients, he thought that no amount of cleanliness and freedom from odour could disguise the fact that, at such moments, sewers were dangerous, and carried the danger far and wide.

Dr. Vidal then followed with some remarks as to the risk of sewers communicating with the outer air, and related how an epidemic had broken out at Croydon by the accidental contamination of the water main with sewage.

This speech, and it was a lengthy one, ended the first day's debate, which imparted a general impression that whatever was done would be badly done, and that the building of sewers in particular was fraught with incalculable danger.

M. Duverdy opened the next day's debate by protesting that too much had been said concerning the dangers of sewers, and nothing about the disposal of sewage. He was willing to recognise that the experiments at Paris and Berlin proved the possibility of rapid transit of matter in the sewers; but the first of all questions was to settle what would be done with the water thus transported. He then proceeded to give a vivid account of the sewage farms near Berlin, describing them as sloughs of despond, where cattle could not graze, but sank up to their knees in mud. The farms were not nearly big enough. For the 300,000 inhabitants of Berlin, no less than 2,017 hectares of farm land would be required. In Paris, with its 240,000 cesspools, 14,000 to 15,000 hectares would barely suffice if all the sewage was to be thrown on to the land.

Dr. G. Varrantrapp, the medical officer of health at Frankfort, then delivered so thoughtful and practical a speech that we are tempted to translate almost verbally the greater portions of this discourse, which, in fact, was received with the utmost attention and applause. The learned doctor urged that local observations, however accurate and authoritative, did not justify our adopting general conclusions. The sewage question was a question of principle. It had become an international question, and must not, therefore, be lowered to the level of a mere parish squabble. The results attained at Paris certainly presented great interest to us all. But the experience acquired at Paris does not touch the question. "I am very willing to allow, for the moment, the imperfections of the Paris sewers,—imperfections that are the more easy to understand, as the town attempted to unite old with new sewers. If there is stagnation,—if there are deposits in the Paris sewers, this is highly regrettable, but it does not prove that these defects are inherent faults of the system of sewers. The question is, whether it is possible to construct sewers where these deposits will not occur? For my part, I confidently affirm that it is possible. I will not speak of the experiments made at Hamburg, Dantzig, and Berlin, where I have visited the sewers, and found no deposits or stagnation, but I will speak of Frankfort, where my observations have been made from day to day. We have real sewers, that is, sewers receiving everything that comes from the houses. These sewers were commenced fifteen years ago, and have now reached a length of 130 kilomètres, fed by 25,000 water-closets, which householders are now compelled to use. Never during these fifteen years, excepting at the period of construction, has it been necessary for a workman to descend into these sewers with a broom or any other implement for the purpose of cleansing. The cleanliness is maintained by the household water, of which 15,000 to 18,000 cubic mètres are daily employed. So great is this incidental flushing of the sewers that a special discharge of water direct into the sewers is rarely if ever required. Yet, in spite of this, there have never been any deposits, either in the little or the big sewers, though the main sewer has only a fall of 1 in 2,000. He challenged the members of the congress to come to Frankfort at any time they chose and to descend any part of the sewers they might select, and he defied them to find any deposits or stagnation. They would further find that the sewers were free from odour, or, at least, they would not be able to detect the odour of human dejections. The water travelled from the farthest water-closet to the sewer outfall in about one hour and a half. Frankfort deems that she has proved the possibility of constructing effective sewers. I will now examine the statistics, which are so often misquoted, that accurate figures lead to inaccurate conclusions. Our statistics since 1850 are very precise in their character. During the first period of five years we had eighty-five deaths from typhoid fever for every 100,000 inhabitants per annum. Then the figure decreases from 1866 to 1868 to 6·1, 1869 to 1871, 7·9. Thus showing an increase after the construction of the sewers, but when, in 1875, the water supply which formerly had been insufficient was added, the figure fell to 2·8 from 1875 to 1877, and to 2·0 from 1878 to 1880. Let these figures be compared with those of Paris, where typhoid fever has increased tenfold within the last few years! This good result is not due entirely, but in part, at least, to the Frankfort sewers. We must remember that modern typhoid fever cannot be compared with the typhoid of thirty years ago. Throughout Europe it has decreased, but other maladies, such as diphtheria, have increased. At Berlin we can establish a comparison between houses that are connected and those that are not connected with the sewers. During the last few years the progress of canalisation has been very rapid, with the effect of reducing the mortality from typhoid fever in the houses connected with the sewer to the extent of one-third; while in the house not connected no reduction whatsoever has taken

* See pp. 349, 364, 394, *ante*.

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place. The experience acquired at Hamburg and Dantzig points to the same conclusions. An outbreak of typhoid occurred in this last town ten years after the building of the sewers, but this was due to a defect in the construction and the insufficient ventilation of the sewers. This is no more a reason for condemning sewers than an accidental gas explosion would be for condemning the use of gas. At Croydon faults of construction once remedied reduced the mortality to about the lowest in Europe, that is, from 11 to 15 per 1,000. Eminent doctors at Glasgow and elsewhere believe that by increasing the number of water-closets the number of cases of diphtheria also increases. But we must not look at the details of a few houses. The question must be judged on a broader basis. The Registrar's return for Scotland shows that during recent years deaths from diphtheria in rural districts have been more frequent than in towns, and yet the cottages in villages have neither water-closets nor sewers. Throughout Prussia diphtheria is more prevalent among the rural populations. But here is another example. From 1862 to 1866 there were about 10,000 deaths per annum from diphtheria in England, but in 1870 to 1880 there were only 3,000 to 4,000 (?). Have the number of water-closets and of sewers been reduced during that period? The Governments of Podolia and Ukrania in Russia had about three times as many deaths from this cause as England; but, how many miles of sewers are there in England as compared to Podolia? Let us be prudent in coming to general conclusions after a partial study of figures." Finally, it had been remarked that it was only the human *dejecta* that poisoned the sewers when these began to ferment. Do not kitchen-waters ferment? Does not kitchen-water give a more offensive odour than that of water-closets? Other speakers wished to divide the waters. Do they not know that Pettenkoffer and many other able chemists have demonstrated that there is no difference in these waters? If we tried to separate the waters what would become of the morbid dejections of the 80,000 or more houses that crowded the streets of the great capital. Then the linen coming from a patient, and which often contained the most dangerous of all matter, has to be washed, and the water would go into the ordinary and not the special sewer. Such questions required serious and comprehensive study, and the conclusion would be that everything should go to the sewer, but above all that there should be no stint of water.

Following on Dr. Varrantrapp, one of the few English speakers insisted on the necessity of ventilation of sewers and disconnexion between house and public drains, and denounced in no measured terms the barbaric condition of French towns.

Dr. Overbeek de Měyer, Professor of Hygiene at the Utrecht University, found that M. Durand-Claye had committed many errors. To begin with, he spoke principally of the Paris sewers. Now, this was the very worst example he could give us. There were three means of applying the English system,—the first was what we saw at Paris, large sewers with domed roof and side sewers opening without valve or any impediment on to the large sewers, and communicating with the houses by pipes that were not trapped. These sewers received a large quantity of organic matter and greasy matter that stuck to the sides and refused to float away. Deposits were the natural consequence, and these remained bare when the falling of the water level after rain disclosed what adhered to the sides. An army of sewer men, more than 800 in Paris, were required to scrape these sides of the sewers. Now, this form of sewer is condemned by all competent men living outside Paris. Mr. Rawlinson, the eminent sewer engineer in England, has declared that if the sewers of Paris had to be made over again it would be necessary to adopt another system. It would effectively have been more logical not to have allowed all the solid matter to enter the sewers when it was so difficult to get rid of it that it had literally to be pushed along by men till it reached the outfall. The second application of the English system is best illustrated by the town of Frankfort. For there main sewers have been constructed under Dr. Varrantrapp and Mr. Lindley, with every possible care; the sections not being too large, with syphons to protect each house and each branch drain. By means of powerful flushing at regular intervals, cleanliness is well maintained, and he was obliged to confess that he could not find any deposits when he visited these sewers. Yet the system is not perfect, for the ventilation of these sewers carried germs, perhaps above the roofs of the houses, but the currents of air could bring them down again into the street, especially where the houses are not all built on the same level. One of the speakers stated that sewer gas always went to the highest point. This is a mistake. M. Rozsahegyi has shown that this was not always so; the course taken by the air must depend on barometric pressure, &c. He further doubted the water-tight properties of the Frankfort sewers. Accidental fissures must occur, and these are very large in the Paris sewers, at least according to the official reports. Thirdly, we have the English sewer applied by means of a separate system. This means one sewer for house and closet water, and another for rain or surface water. In the former, flushing by automatic syphons is established. The separate system, qualified as tolerable where nothing better can be had by M. Durand-Claye, is, on the contrary, the best of all systems. It is advocated by the most eminent English and American engineers. Mr. Robert Rawlinson would like to apply it to the towns of London and Paris, and it is now actually working admirably in the towns of Penzance, Carlisle, Dover, Chelmsford, Ely, Rugby, Reading, Oxford, and in America at Lennox, Cumberland Mills, and Memphis. The statistics quoted often showed an improvement, but this was due frequently to improved water supply rather than the building of sewers. Thus at Croydon, during the epidemic of 1875 (April and October), 950 cases of typhoid and 87 deaths occurred in 10,456 houses with water-closets, while only nine cases and three deaths occurred in 1,070 houses without water-closets. Alluding to the Liernur system, he remarked that it admitted the use of five litres per head per day in the closets, while M. Alphand demanded for Paris only three litres. He was aware that the Paris engineers demanded more (M. Durand-Claye, "40 litres"), but evidently this was not required for the sole purpose of cleanliness. This quantity was not necessary for cleanliness, but as a motive power to push heavy substances along in the sewers. But M. Liernur did not demand any such help, for he produced a vacuum in his pneumatic sewers. If foul matter did get into the other sewers it would be an exception, and, as such, would not stagnate. The municipality of Amsterdam had answered to the inquiries of the Prague municipality that (1) the Liernur system, tried for eleven years, had worked thoroughly well; (2) cost but little, and paid good interest; (3) the metal pipes remained absolutely water-tight. The rare impediments were caused by abuses, never by any fault in the system, and were easily removed; (4) the estimates of Captain Liernur deserve every confidence, the expenses being, if anything, over-estimated; (5) the system is superior to all systems known from the hygienic, financial, æsthetic, and technical point of view.

Dr. Loiseau, member of the Paris Municipal Council, then delivered a lengthy speech, aimed at his electors rather than at the members of the congress. It was difficult to discern what the honourable councillor's opinions might be, but he admitted the necessity of water, the danger of germs, the success of the irrigation farm at Gennevillier; in a word, he recalled the typical reply of M. Prudhomme on being presented with a sword of honour,—"This sword is the happiest day of my life; I will use it to defend our Government and national institutions, and, if needs be, to combat them."

During the third day's debate on these questions of sewage, the speakers from Geneva took a leading part. M. Armourdier, town contractor, explained how Geneva was drained and the drains flushed, from which it appeared that a sort of receptacle placed where the cesspool used to be, and where all the house-drains united, was periodically flushed from the water main, which was placed within the sewer, and communicated directly with the branch sewers or house-drains, and with the taps whence was drawn the drinking-water! On objections being raised by the English present, the only answer was the old argument that the pressure of water prevented the sewer-gas entering the water-main.

Another speaker insisted on the necessity of maintaining the water at the same level in the sewers. At Rheims, 30,000 cubic mètres of water passed through the sewers in twenty-four hours,—28,000 cubic mètres during the day time, when all the wool-carding factories were at work, and only 2,000 cubic mètres at night. As a natural result there were horrible smells at night. This, indeed, explained the prevalence of smells, so general at night in towns. Under such circumstances sewers were always dangerous, however well they might be constructed. The great problem was how to maintain the water level always at the same height in sewers.

Dr. C. W. Covernton, member of the Ontario Board of Health, described the measures taken by the public authorities in Canada, the appointment of Government engineers to see that drains were properly laid, trapped, and ventilated to the top of the houses, and various other eminently practical efforts that redounded to the honour of the Canadian sanitary administrators.

Dr. Hauser, of Seville, followed, and presented an elaborate and most carefully-calculated work on Seville, with maps, showing the death-rate for each quarter of the town, and, as compared with the state of the sewers. This led to the conclusion that the lowest and best-drained districts were the most healthy. The patients in the hospitals contracted the diseases special to the quarters where the hospitals were situated. Altogether, this remarkable study, too replete with facts and figures to bear condensation, concluded in favour of the principles generally accepted in England with respect to the draining of houses.

M. H. Bourrit, architect, Geneva, then delivered an optimist speech on the condition of Geneva, in which he boasted that the sewers were not ventilated at all, and that no complaints were possible. As a matter of fact, complaints are possible, and were very freely uttered during our stay in Geneva. The sewer mouths are all trapped by syphons, and there are syphons between the house-drains and the sewers. The confined sewer-gas is, therefore, highly dangerous; and when, in spite of water-seals, it makes its escape, the results are anything but pleasant or safe. Also, when we think that it is in these unventilated sewers that the drinking-water is conveyed, the prospect that an accident to the pipes suggests is anything but pleasant. Still, M. Bourrit and the other speakers of Geneva seemed quite satisfied with the present state of affairs, and their only anxiety was to know whether or not they should create a sewage-farm or continue throwing all the sewage into the Rhone.

At last, this long debate was brought to a close by M. Durand-Claye, who very adroitly pointed out that all opponents to the "*tout à l'égoût*" principle came from towns where it was not practised, but that no one from the numerous English, German, and American towns, where everything went to the sewer, had come forward to advocate a return to the cesspools as of old. The great point he urged was water. No system was perfect that did not allow the poorest person to deluge his family with water. Movement, movement of water as of air, was the only means of cleansing our sewers as of ventilating our rooms. The man who wants to be clean washes himself; we must wash our sewers, not so much by direct flushing, as by great volumes of water going through the houses first. M. Durand-Claye further defended the large-sized sewer on the ground that in it the water met with less friction and therefore ran quicker. Finally, he invited all the members of the congress to visit the sewage farms at Gennevillier.

Altogether, it seemed pretty evident that the majority were in favour of allowing everything to go to the sewer, but opinions were much divided as to the advantages of the Liernur and Berliez systems of pneumatic drainage and the ordinary process. The German, Dutch, and English speakers alone seemed acquainted with the practical problems involved in the question of trapping and ventilating sewers and house-drains; and to Englishmen the debate seemed confined too much to general principles, and did not deal sufficiently with those details of application which, if neglected, compromise the best of theories.

The Baroness Burdett Coutts has acceded to the invitation of Mr. W. Busbridge to deliver the Queen's prizes to the students of the Metropolitan Drawing Classes. The ceremony will take place at the Guildhall, on Thursday, October 12th. The Lord Mayor will take the chair at eight o'clock.

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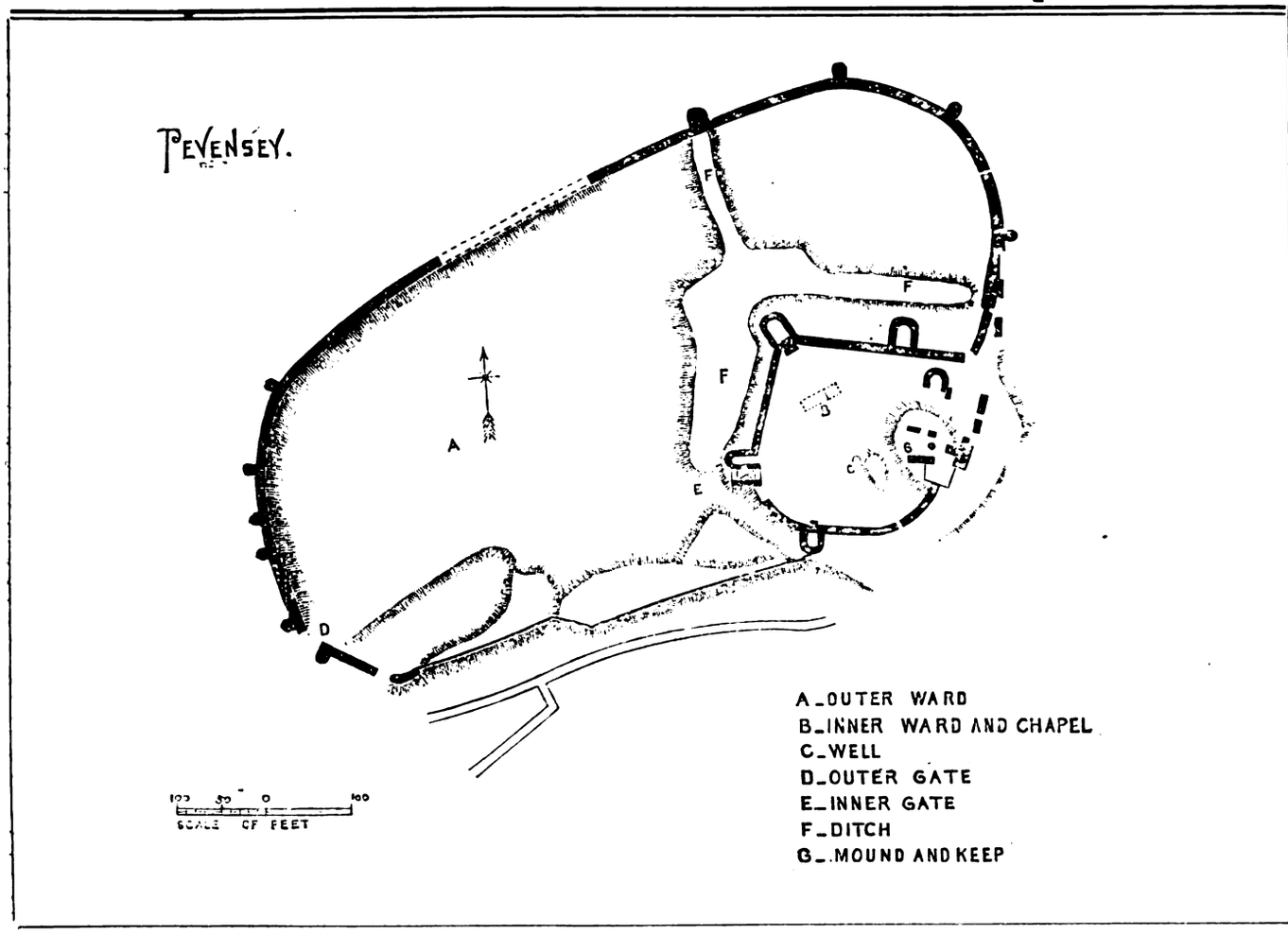

PEVENSEY CASTLE.

PEVENSEY is, in some respects, the most interesting place in the South of England. Not only is it closely associated with English history during the eleventh and twelfth centuries, but its ancient and present names, and a part of its material remains in masonry and earthworks, connect it closely with the British, Roman, and early English occupation of our island.

It was, without doubt, the chief place in the great forest of Anderida, which, in remote times, extended over the south of Sussex and the Weald of Kent, and of which the not infrequent remains are seen in the very numerous and wild parks found in these districts. The British name, both of forest and town, is preserved in its Roman form, and the site of the latter is still indicated by its Roman walls and towers, which compare with those of Porchester in extent and completeness, and, like them, have been incorporated into a later fortress. The Romans probably left Anderida in good repair. One of the chief strongholds of the "Comes littoris Saxonici" was not likely to have been neglected, and it appears, from the Saxon Chronicle, that the Britons were well aware of its value, and held it against their piratical invaders with fierce but unavailing valour. Late in the fifth century it was besieged and taken by Ælle and Cissa and their followers, and every Briton within it was put to the sword. Possibly to this period are due the marks of undermining still to be seen along the exterior base of the Roman walls, and to some period between the original construction of the wall and additions by the Normans are to be referred the slips of the soil by which the foundations have been weakened, so that the wall, unsupported, has given way along the south front.

Andredes-ceaster or Andreceaster, from a Roman and British, became an English fortress, and, by slow degrees, the Forest of Andredes-weald became encroached upon by cultivation. The change of masters also brought a change of name, and the island or "eye" in the marsh became the property of a supposed "Peofn," whence its present name is thought to be derived.

Under the English rule, law and order and the divisions and names denoting property were gradually introduced, and Pevensey became the chief town of a Rape, an honour it shared with Chichester, Arundel, Bramber, Hastings, and Lewes, in each of which the town was distinguished by early earthworks, and at Chichester by Roman walls. Each of these Rapes, divisions thought to be of Jutish origin, had its town and fortress, and each town was placed upon a river. That of Pevensey rises in the wooded ridge about Penshurst and Dallington by a number of streamlets which meander athwart the marshy level of Pevensey, until a little above the castle they form what is still known as the old Haven, and which was in use in the twelfth century. As late as 1317 a grant by Edward II. mentions the marshes as overflowed by the sea, and as in no man's tenure. The castle then stood on the margin of the sea, from which it is now more than a mile distant, and the whole area of the level, many square miles in extent, seems to have been an impracticable morass, covering the fortress towards the south and east, and in some degree to the north. The knoll must so have presented itself to Julius Cæsar, if, as generally supposed, he here landed, and so, with the addition of the Roman walls, it was certainly seen by Ælle and his followers, and 500 years later by Duke William when he landed between Eastbourne and Hastings, and selected the higher ground to the east of that castle for his march inland to give battle. "Mare transivit," says the Bayeux tapestry, "et venit ad Pevensae," and the chronicle of Battle says he landed "prope castrum Pevensel dictum," whence the soldiery went to seek victuals at Hastings. Here, then, it was, beneath these very walls, that the Conqueror took seizin of his yet unconquered kingdom.

Pevensey, under the Normans, became once more a place of consequence, and one of the havens through which the sovereigns kept up their communications with Normandy. It was hence that the king embarked on his return to Normandy in 1067. William granted it to his half-brother of Moretaine, who is said to have built a castle there. What he actually built is unknown, and the only existing masonry that can possibly be of his date is the bro' n . iperstructure of one, or perhaps two, Roman towers, and some rude repairs executed on the face of one of them. But whatever he did he held, and continued to hold the Roman castle till his death, and he so held it against William Rufus, in 1088, being supported and encouraged by Bishop Odo of Bayeux, and by the hope that Duke Robert would come to their relief from beyond the sea. This hope was fallacious. Rufus having stormed the mound of Tonbridge, laid siege to Pevensey. The garrison was brave, the Earl Bishop and his brother Count were skilful generals, the walls were high and strong, and for six weeks the king, at the head of a numerous army, assailed the place in vain. A tardy force sent, not led, by Duke Robert, strove to land beneath the castle wall, but, though the king's English soldiers were thus placed between the double attack from the castle and the ships, they overcame and, for the most part, slew the invaders. The castle was surrendered, and Odo, transmitted under a guard to Rochester, contrived to enter that castle, and to encourage its garrison to hold out.

Pevensey next comes under notice in 1101 as the muster place of the army led by Henry I., to repel this expected invasion of Duke Robert. He was so far successful that the invaders were driven to land at Porchester. Either under Earl William of Moretaine, who was taken at Tenchbrai and lost his lands, or under his successor, Gilbert de L'Aigle, the Lewy of Pevensey was erected into an Honour, and finally became the Honour of the Eagle, "Honor de Aquila." In 1144 the castle was attacked by Stephen, and defended by Gilbert de Clare, then holding it for the Empress, to whose son Henry it had been granted by Henry I. It next came to King Stephen, and about 1216 became the property, under the Crown, of William de Warren, and after various confiscations and restorations, was finally lost to the De Aquila family in the reign of Henry III. John, Earl Warren, took refuge here in 1264, after the Mise of Lewes, and in the following year it was held by Peter of Savoy for the king against the younger De Montfort. Very little of the present Mediæval masonry could have been standing during these various sieges. The strength of the place must have then mainly depended upon the Roman

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exterior wall, furnished, no doubt, with a Mediæval parapet, and dominated by the early English mound, with probably a shell keep, of timber or masonry, upon it.

About 1269 it fell into the hands of Prince Edward, and remained a while in the Crown. In 1309 it was in a ruinous condition, "Confractum et male custoditum," Edward I. having declined to repair it. It must have been soon after this, judging from the evidence of the existing masonry, that the present additions were made, that is, either at the close of the thirteenth or very early in the fourteenth century. The towers are attributed to Edward II., in 1309.

Pevensey, "La Ville et la Lewee de Penense," was included in the extensive grants made by Edward III. to John of Gaunt, under whom and the Duchy of Lancaster the Pelhams became hereditary constables. In 1399 Lady Pelham distinguished herself by holding the castle for Richard II. against the combined *posse* of the counties of Kent, Sussex, and Surrey. After this event it was mainly used as a state prison. Edmund, Duke of York, was confined here in 1405, and in his will bears testimony to his good treatment; and here also were imprisoned James I. of Scotland in 1414, and in 1419 Joan of Navarre, the last queen of Henry IV. In 1650 the castle had a narrow escape from the claws of the Parliament, the materials having been sold for building purposes.

The history of the building, though aided by passages in the public records, is mainly to be established by the study of the material remains. Those of the Roman period have fallen under the searching and very accurate notice of Mr. Roach Smith; the present paper deals mainly with the Mediæval additions both in earthworks and masonry.

DESCRIPTION.

The Roman fortress is in plan a rounded oblong, 220 yards north-east and south-west by 115 yards, and contains from 8¼ to 9 acres. It is included within a wall strengthened by towers, and here, as at Lyme, the outline of the plan was evidently governed by that of the ground on which the castle stands, and which rises 8 ft. to 10 ft. above the sea level and that of the surrounding marsh or meadow. The wall is from 10 ft. to 11 ft. thick throughout, and at this time from 20 ft. to 30 ft. high. The length in circuit is about 580 yards. At the bend of the enclosure, towards the south-west, is the main entrance, preserving, very nearly, its original form. Two half-round towers, 28 ft. apart, and 20 ft. diameter, with produced flat sides, giving them a depth of 30 ft., and 30 ft. high, project 20 ft. from the curtain, and were connected by a cross wall, of which only the foundation remains, and in which was the outer gateway. These towers are not quite parallel, but their longer axes radiate slightly outwards. They are solid and have no internal projection, but from each of them a wall ran backwards 18 ft., terminating in a cross wall, in which was the second gateway, the foundations of which show that the base had an opening of 9 ft. This rectangular gatehouse must have resembled those of Porchester, and, like those, had evidently been altered to suit the Norman entrance, of which there remains one jamb of the outer gateway.

Besides the towers flanking the entrance are eleven others upon the curtain wall. These also are solid, of the height and age of the curtain, and without internal projection. They vary from 14 ft. to 20 ft. in breadth, and from 14 ft. to 16 ft. projection from the wall. They stand at irregular distances of from 14 to 35 yards. Besides the thirteen standing towers there are two displaced and broken down, and the fragments of two others, making seventeen in all. They are closest along the north-west and north fronts, where the ground outside is highest. Towards the south and east there are but few, the shallow muddy sea and the marsh being found a sufficient protection. Besides the main entrance there were three posterns, of which that to the north-east is still in use. That to the north is broken down, but its remains show it to have passed obliquely through the wall. The southern postern was probably a water-gate. In the south wall the mouth of a sewer, about 18 in. square, and opening towards the sea, has been laid open. Although the wall is for the most part thickly covered with ivy, it is pretty evident that in parts it is still capped by a later battlement, and one of the northern towers, originally 32 ft. high, bears a superstructure of 18 ft., which, from a window in its side, appears to be of the Norman period.

The wall has been breached on the north front for 65 yards, and its mass, thrown forwards, still encumbers the ground outside. To the south is a much longer breach, at least of 200 yards. This seems to have been produced by a slip of the soil, by which the foundations have been moved forward bodily several feet. At the east end also the wall has been broken down, but here its fragments, which are of considerable bulk, are mixed up with others of later date in wild but not absolutely inextricable confusion. Most of the north wall has been picked into to a considerable depth, at the ground level, but the foundation remains uninjured. This is more probably the work of the Northmen than of those who, in later days, laid siege to the Norman garrison, for these latter would have worked below the surface of the earth, and have inserted props of wood beneath the base of the masonry to be set on fire, and so to have caused the destruction of the whole superincumbent mass. No gunpowder has here been employed.

It is evident that there was formerly a ditch at the foot of the wall on the south front, full of water, where, indeed, it may still be traced. Along the north, west, and east fronts, the wall is bordered by a road, to make which the ditch, probably never very wide or deep, has been filled up. There can be no question as to the authors of the exterior *enceinte*, both wall and towers. They are all of one, or very nearly one, date, and distinctly Roman, and, which is not always the case, the towers are bonded into the walls. The substance of the masonry is very rudely-coursed flint-rubble, chiefly composed of flints and pebbles from the adjacent sea-beach, mixed with angular fragments of stone, the whole held together by mortar very freely employed. This mortar is remarkably white in colour, and contains numerous small pebbles, little if any broken tile, and a preponderance of sand. On the whole the mortar has set firmly, and holds well together the rather heterogeneous mass of materials. The face of the work, both inside and outside, is composed mainly of squared stones from Eastbourne or Beachy Head. They are generally about 6 in. by 4 in. on the face, but sometimes as large as 12 in. by 6 in. The lowest courses at the ground-level are composed of darker and far larger stones, and in the wall above are occasional double bands of tile, and sometimes of stone nearly of the colour of tile. A good deal of the facing at the lower part of the wall has been stripped off, but inside this stripping is confined to the part of the wall just above the ground-level, which is raised artificially higher than the level of the natural soil. In some places this addition is high enough to convert the lower part of the masonry into a retaining wall. It has been thought that the earth thus employed was derived from the inner ditch, an Early English work. It may be so, but more probably the contents of this ditch went to form the mound, and it is possible that the raised soil may be derived from the ditches of a British camp preceding the Roman occupation.

The Romans, who constructed the outer walls, seem to have been content with a single line of defence; but the Northmen treated the whole area after a different fashion. Within the area, at its eastern end, a mound was thrown up, table topped, and about 30 ft. high; this, though within the area, was upon its margin, and rested against the eastern wall. The material for the mound seems to have been derived from a ditch which surrounded about two-thirds of its circumference, extending from wall to wall, and which thus isolated it from the remainder of the Roman area. This ditch has been filled up, probably to give space, but its line is still marked by a slight depression in the soil. By this means a strong place would be formed very nearly in accordance with the Early English practice, having a mound or bank, with its proper ditch, and an appended court. The only peculiarity would be that the court was walled, and thus the ditch of the mound would be traversed by the masonry, and the outer side of the mound supported by it.

The Normans, who at once saw the value and took possession of Pevensey, probably were for a time content with the Roman walls as they stood, and with the palisaded citadel of the mound. At least, there is no certain trace of any very early Norman masonry. Indeed, the only masonry of Norman date at all now to be seen is a fragment of wall with a window, the remains of a superstructure upon one of the northern towers, and some patchwork in flints, and a few courses of stone laid herring-bone fashion, by which the face of another of the Roman towers has been repaired. Had the Normans of the eleventh or twelfth centuries constructed any eastern walls, gatehouses, or mural towers within the court, some trace of them would probably remain. The chapel, indeed, judging from its dimensions, was probably Norman, and the base of the font decidedly so, and it is possible that the shapeless fragments of rubble masonry which encumber the top and slopes of the mound may be of the same, that is, of late Norman date. In truth, the castle, as the Normans found it, was a very strong place. The walls only needed a battlement, and even if this were surmounted, the entrenched and palisaded mound would be perfectly defensible so long as provisions held out.

At this time, however, the Roman *enceinte* contains the remains of a strong and tolerably perfect Mediæval castle. This, as usual in such cases, takes the form of an addition to the defences of the mound, shutting it off as a citadel from the rest of the works. Advantage was taken of the broad and deep ditch extending from the east to the south wall, 210 yards in length, curved westwards or outwards, and which shut off the mound, and a part of the great area within it, and thus formed an inner ward, of about an acre and a quarter, containing the mound or keep. The ditch, which was probably supplied with water from the sea at its south end, gives off a branch northwards towards the Roman tower, called the watch-tower, and this cuts off the north-east corner of the ground, which thus forms a sort of small middle ward between the forks of the ditch. Behind the ditch is a curtain wall, near the centre of which is a gatehouse of some pretensions, and three large drum towers, of which two flank the gatehouse, and one is placed to the north of it.

The gatehouse points to the west, opposite to that of the Roman area, now the outer ward, at a distance of 184 yards. In front of it are the two solid piers of the drawbridge, 14 ft. wide, and approached from without between curved wing walls. The piers were faced with ashlar, now stripped off. The space between them is 12 ft., and may have been 10 ft. The gatehouse is composed of two half-round towers, produced backwards to contain the entrance passage. Outside, these towers somewhat resemble those of the Roman or outer gate, which may have served as their pattern. Their loops are of unusual length, one being 15 ft. long. The vents of two garderobes are seen, opening flush with the wall. One seems to be the lower end of a loop. They contain a basement, a ground, and an upper floor, looped towards the field, not vaulted, and duly provided with garderobes. The north tower, faced with sound, though rather open-jointed, ashlar, is still standing, though mutilated. In its ground-floor is a fireplace. The south tower is quite broken down. The entrance passage is tolerably perfect, although the gateway at each end is gone, as is the upper chamber for working the portcullis, of which part of the grooves remain. The passage, 12 ft. broad and 35 ft. long, was vaulted with a segmental vault, strengthened with plain broad chamfered ribs, now broken away, and in the vault, a little behind the portcullis, is a large square central hole or "meurtrière" for the defence of the passage. In either wall is an arcade of two arches, a larger and a smaller, low pointed. The larger are closed, the smaller pierced by doors opening into the ground-floors of the gatehouse.

Flanking the gatehouse, at a distance of 33 yards north and 54 yards south, are two grand round towers, each capping an angle of the curtain. The north curtain has a base or plinth slightly battering. The wall is vertical. There is no cordon between them. The north-west tower is 30 ft. diameter and has a basement, ground, and upper floor. The basement, though below the inner ward level, is on the level of the ground outside. It is arcaded, having six arches in its rounded sides, and one in its flat end or gorge. These arches have a drip of the double-scroll pattern, and between each pair springs a moulded rib, and one from each of the two right angles, eight in all. They are broken away, but their profile is seen, and the plan of the vault may be inferred. The entrance to this chamber is by a straight staircase from the inner ward, and at the foot of the stairs is a lobby on the

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left or west side leading to a postern doorway placed at the junction of the tower with the curtain. In the gorge wall is a fireplace the hood of which seems to have been of timber. It is difficult to understand what this chamber can have been intended for, with its ornate details, and a fireplace, and yet half under ground.

The ground-floor is entered from the inner ward by a separate entrance, in the right or east wall of which an opening passes into an oblong mural chamber, vaulted, and contained within the curtain. This chamber has a water drain, and above it, in the wall, three bold corbels, and above these a small segmental-headed doorway, now blocked up. This is a very peculiar arrangement, and it looks as though there had been a wooden structure, perhaps a garderobe, bracketed out upon the face of the wall, over the ditch, at about 10 ft. from the ground. The upper floor of the tower was entered from the battlements, the tower rising above the wall. Only the basement floor was vaulted. Each stage is lighted, or rather ventilated, by loops, towards the field.

The southern flanking tower is nearly upon the pattern of that last described, save that the basement is not arcaded, and none of the floors vaulted.

The third tower, in the north wall, 36 yards from the north-west flanker, is of the same pattern, with the same exceptions. The staircase into the basement has a side door opening upon a postern in the east wall, with a segmental head, and from the ground-floor entrance there opens, westwards, a long mural chamber, the counterpart of that described as attached to the north-west flanker, having also brackets and corbels, and a small door in the wall, 10 ft. above the ground, as though for a timber garderobe. These are all the regular towers, but in the south wall, where a tower might be expected, is a postern, which pierces the wall at its junction with the Roman wall, and outside and in front of it is a fragment of a Roman tower, which has slipped forwards a few yards, and forms a sort of bulwark concealing and protecting the postern. It is evident that the displacement of the tower is older than the Norman period, and was taken advantage of by the later builder. In the north wall of this inner ward, between the north and north-west towers, is a large fireplace, perhaps that of a hall. The kitchen was probably in the north-west tower, and the large mural drain connected with it.

The mound which occupied the east end of the castle and carried the keep, remains tolerably perfect, though much encumbered with ruins produced evidently by gunpowder. Against its east side, and supporting the mound, is a Roman tower, which was worked into the keep, its solid top being battlemented. The mound has a spur of earth towards the north, probably connecting it with the north wall, but nothing definite can at present be ascertained, though the foundations upon it, if laid open, would probably disclose something.

As the Mediæval castle is placed within the eastern end of the Roman area, its eastern side osculated with the Roman boundary, which is here common to both areas. About four-fifths of the enclosing wall of the castle is Mediæval, but the remainder, that towards the east, is Roman, which is thus common to both fortresses. Commencing at the south postern, where the two walls are in contact, to the great disadvantage of the masonry of later date, the Roman wall extends, partially propped up by a later buttress, until it reaches a Roman tower that connected it with the keep mound. Beyond this, passing southward and eastward, to where the Mediæval wall springs from the Roman *enceinte*, the Roman wall has been left to support the mound, but about 6 ft. in front of it a Mediæval wall, 9 ft. thick, has been built, probably to afford more space above, and to assist in supporting the earthwork. The castle has been attacked on this side, or else those who dismantled it, thinking this the strongest part, have mined and blown it up, for the glacis for many yards is covered with enormous masses of masonry, which have evidently been displaced by gunpowder, exploded in large quantities. At one part, abutting upon the Roman tower, the two walls are seen. About 20 ft. of the Mediæval wall, 9 ft. thick and 10 ft. high, stands undisturbed, though above this height its superstructure has been blown off. Behind it is the Roman wall of about the same height, not only reduced in height by the explosion, but tilted forward. This is what has happened in this quarter, and the history of it is clear, even in the midst of so great a confusion.

Within the Mediæval or inner ward an excavation shows the position and plan of the chapel, with a nave 40 ft. by 8 ft. or 9 ft. broad, and chancel of 12 ft. by 11 ft. A fragment of the font has been preserved. The chapel is, no doubt, of Norman date, and older, therefore, than the castle in its present form. There is also a rude pillar piscina, or perhaps a holy-water stoup, such as is now and then found in Norman buildings. There are one or two in Glamorganshire. The free chapel in the castle is mentioned in the grant of John of Gaunt. The well also has been discovered at the foot of the mound. It is cylindrical, 7 ft. diameter, and lined with ashlar to a depth of 52 ft., below which it is square and lined with timber.

The Roman works at Pevensey have been explored and examined with great skill and success by Mr. Roach Smith. Unfortunately the Mediæval castle has been less fortunate, and has not been accurately described. A short but complete and brilliant description of Pevensey, and a notice of the part it played in the campaign of 1066 will be found in Mr. Freeman's "Norman Conquest." It also plays a conspicuous part in his recent life of the Red King.

G. T. C.

THE EXHIBITION AT TRIESTE.

THE city of Trieste is now celebrating the five-hundredth anniversary of its annexation to the Austrian dominions by an exhibition, which has for its purpose the display of products of Austro-Hungarian industry in various branches. Matters relative to navigation are treated with a completeness which gives the exhibition in this respect almost the character of a special nautical display. Thus codes of signals, rules for avoiding collisions at sea, nautical calculations, maps, instruments, books of reference, &c., are shown in a systematic manner. Submarine electric illumination also forms a subject of illustration. The hygienic arrangements of the port are designed with a view to prevent the introduction of epidemics from the Eastern countries between which and Trieste important trade relations exist, and the various official bodies connected with the sanitary inspection of Austrian vessels have placed in the exhibition various interesting records of their activity in the cause of sanitation.

The display of Oriental furniture is well arranged, and the mineral wealth of the Austro-Hungarian monarchy is exemplified in a very complete manner. Sections of the woods grown in Croatia are exhibited, and form an interesting display.

One notable feature with respect to the exhibition is the absence of art from the subjects illustrated. As, however, there has recently been at Vienna an exhibition of art, the Trieste display may be considered as appropriately following it up. The situation of the exhibition on the seashore is in harmony with the general character of the display. The Milan pavilion is spoken of as being specially effective, being built of elegant ironwork on a solid stone foundation. The view of the exhibition and its surroundings from the sea is said to be very picturesque, the grounds being laid out in artistic style.

THE STATE OF WORDSWORTH'S GRAVE.

THOMAS DE QUINCEY records that on the 23rd of April, 1850, Wordsworth was "buried in the green churchyard of Grasmere, between a yew tree of his own planting and an aged thorn." In this "churchyard among the mountains," beneath "a plain blue stone, a gentle dalesman lies"; the stream of the Rothay murmurs near his grave in the valley under the shelter of Fairfield,—Faarfell, the mountain of the sheep,—and the crag where Sidrophel and the Ancient Woman,—

> "Dread pair that, spite of wind and weather,
> Shall sit upon Helm Crag together."

In this churchyard are also laid the poet's wife, "the phantom of delight when first she gleamed upon my sight," his sister, "impassioned Dorothy, the gift of God," and his daughter Dora. To this resting-place of a family that were "lovely in their lives, and in their death were not divided," pilgrims have flocked, as to a holy shrine, from all the continents of the world. We visited the spot last week. After viewing a marble medallion head of Wordsworth, in St. Oswald's Church, a strange old building, very rude and rough, with a roof that recalled the architecture of a Highland cottage, we went in search of his grave. Though one of the tiniest of country churchyards, we had actually to ask a woman, who lived at the gate, to tell us where the grave was. We saw a path among the grave mounds, about 1 ft. in width, and followed it, and it led to a dirty dark corner, where several blue-black head-stones of slate stood. Could this be the resting-place of Nature's tender lover? It was; and we felt a chill come over us. The day was beautiful: the sun was shining in a cloudless sky, but everything round the spot we had come to seek seemed decayed and withered, like a grave in the centre of a dirty smoky town, not in beauteous Grasmere. No green grass was there, all was dull, dank, and depressing. The poet's corner must be badly drained, for we could scarcely get near enough to read the inscription, in consequence of an accumulation of water that formed a trench at least an inch deep at the base of the stone curb that held the iron rails surrounding the grave. The contrast between the sunlit mountains and the gloomy surroundings of his grave who sang of them so lovingly and well was extremely painful. Must Wordsworth's grave become an "ancient monument" before something will be done for its preservation?

THE NEW ROYAL ST. ANNE'S ASYLUM, REDHILL.

THE accompanying design for the New Royal St. Anne's Asylum, Redhill, was one of the two submitted in competition by Mr. A. Hessell Tiltman, M.R.I.B.A., architect, of 7, John-street, Bedford-row. The plan attached will describe the general arrangement of the main building. Accommodation is provided for 260 boys and 140 girls, together with the necessary apartments for the officials attached to the establishment. The chapel is placed, as shown in the view, immediately in front of the building, and the head-master's house immediately to the right. The infirmary is at the north-eastern part of the site, well isolated from the general building, and with a southern aspect. Immediately adjoining is the cricket-field. Attention, it is claimed, was directed to the proper sanitary arrangement of all parts. The lavatory blocks in the centre of the boys' court are placed mid-level between the ground-floor and the level of the playground, so as to be conveniently accessible from either. The author claims for this plan great simplicity and compactness of arrangement, together with easy intercommunication between all parts for the officials. The amount to be expended being but small, no attempt was made to gain effect at the expense of ornamental features, the author relying entirely upon the grouping of the various parts, and the colour of the materials used. The cost of the design, cubed up at an average of 7d. per foot, was estimated to be 35,820*l*.

An alternative scheme was submitted also, interpreting the conditions less liberally, and capable, consequently, of being executed for a somewhat less amount.

The Railway Appliances Exhibition.—The arrangements for holding the exhibition of improved wagon-couplings and other railway appliances at Darlington on the 3rd of October and four following days, under the auspices of the Amalgamated Society of Railway Servants, and in connexion with their annual congress, which will open on the same day, have been reported to the London committee at the chief offices of the society, City-road, as progressing satisfactorily. Many applications have been made by inventors and patentees for space; and, from the nature of some of the applications, it is believed that in improved signalling arrangements and modes of electric communications between guards, passengers, and drivers, the exhibition will be particularly interesting, not only to railway *employés*, but to the travelling public. It was reported that in order to have the improved wagon-couplings practically tested, the North-Eastern Railway Company have consented to provide wagons for the competitive trials, which will take place at the Great Northern sidings, Bank Top, on Thursday October 5.

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THE GERMAN IMPERIAL PARLIAMENT HOUSE.—The Design by Herr Friedrich Thiersch.

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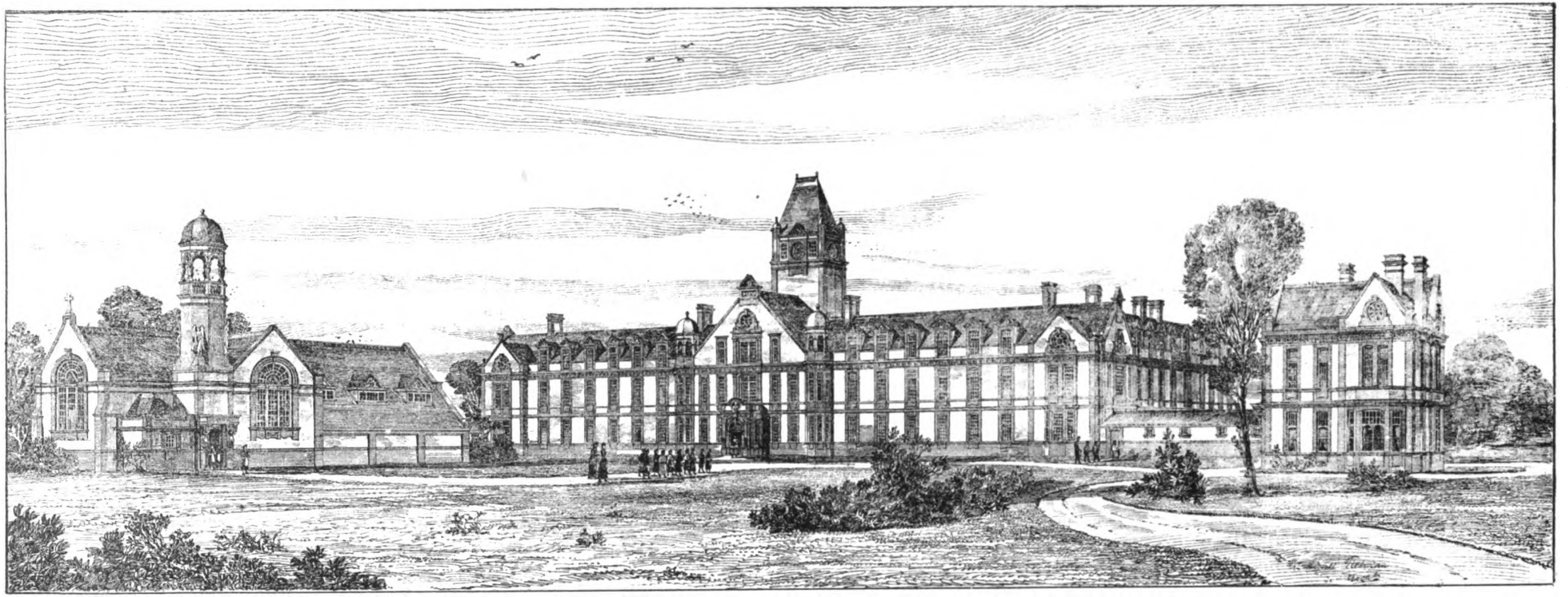

DESIGN FOR THE NEW ROYAL ST. ANNE'S ASYLUM, REDHILL.—By Mr. A. Hessell Tiltman, Architect.

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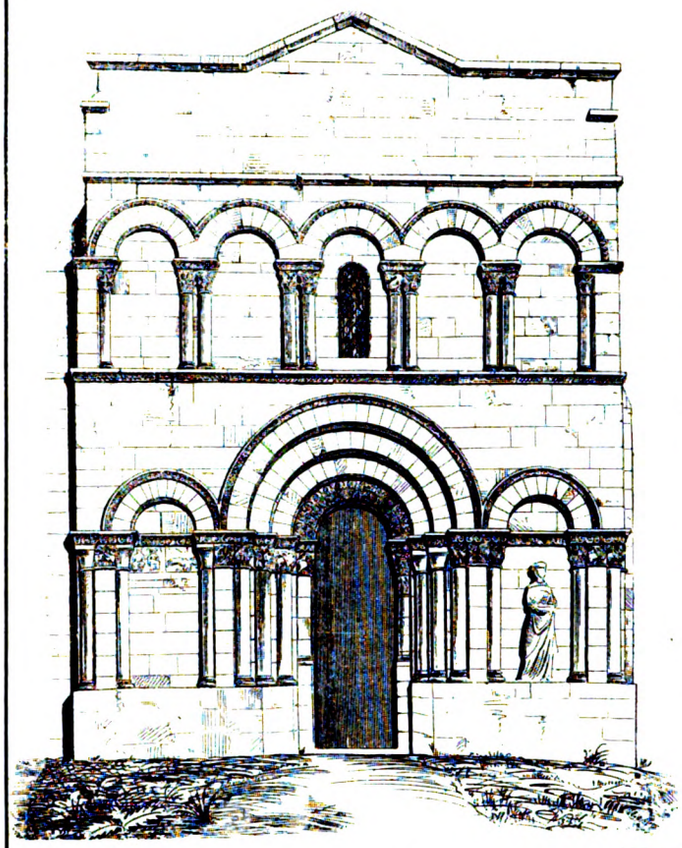
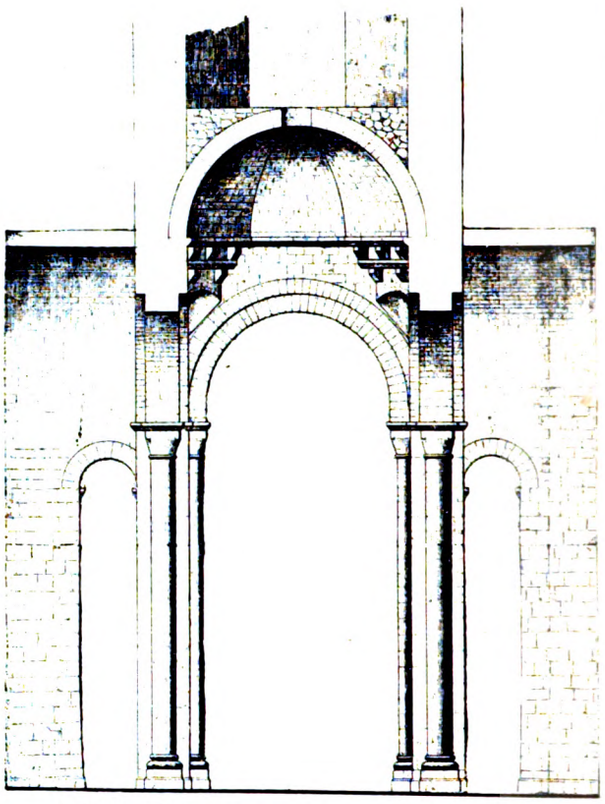
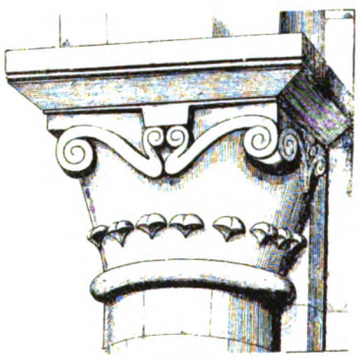


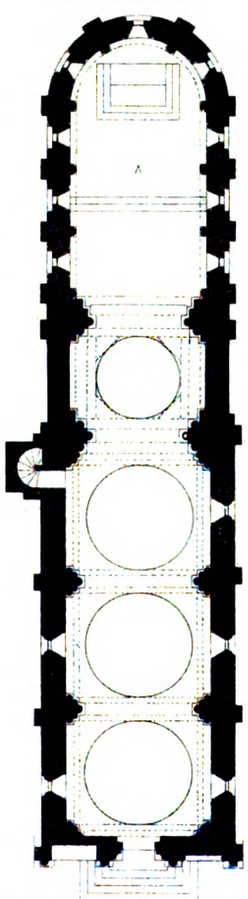
DIRAC, WEST FRONT.

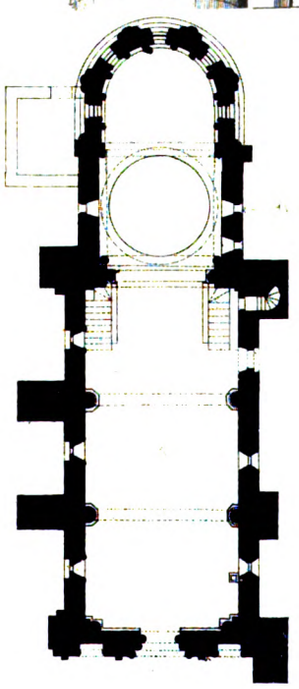


CHATEAUNEUF, TRANSVERSE SECTION.

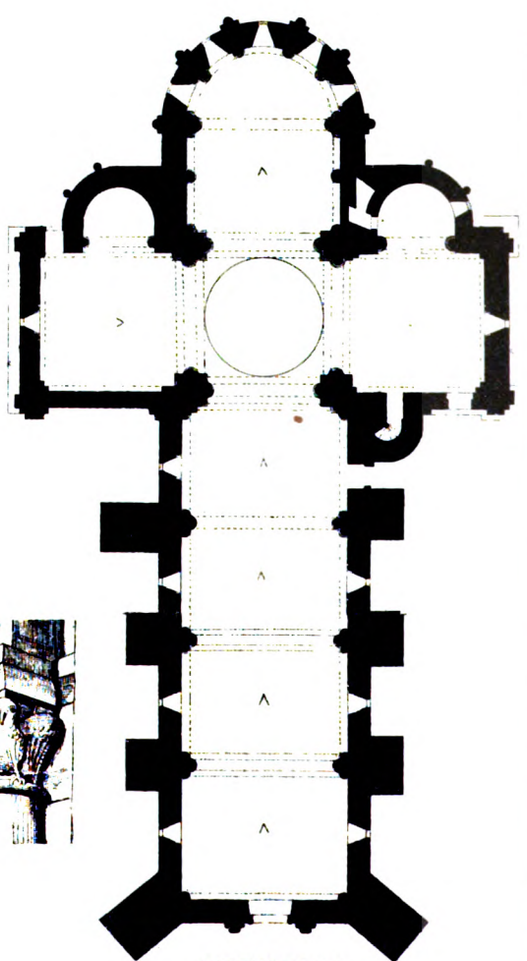


ROULET





PLASSAC



BERNEUIL

Scale of Feet

Whiteman & Bass, *Photo-Litho*

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DOMED CHURCHES IN THE DEPARTMENT OF CHARENTE, FRANCE.

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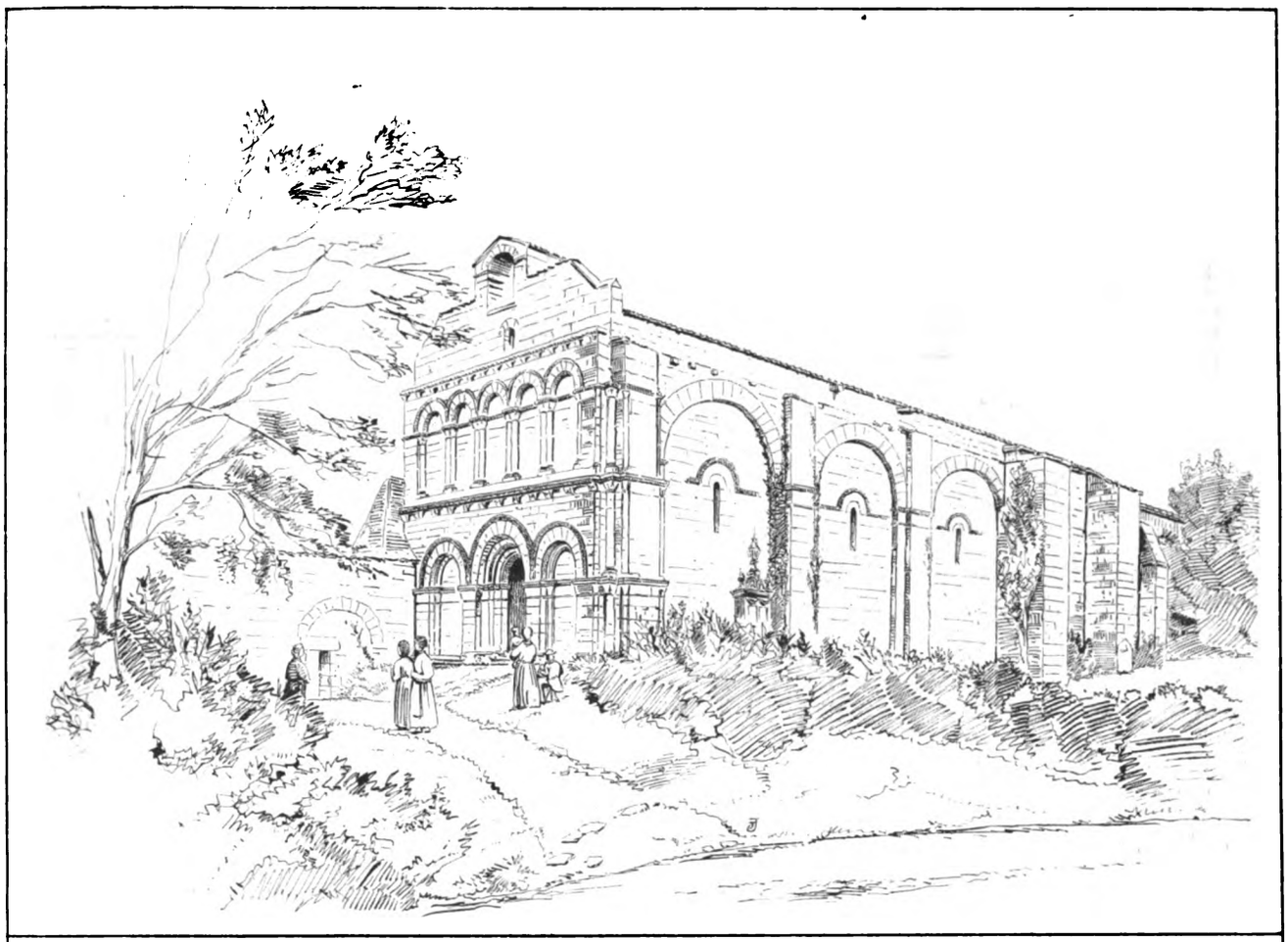
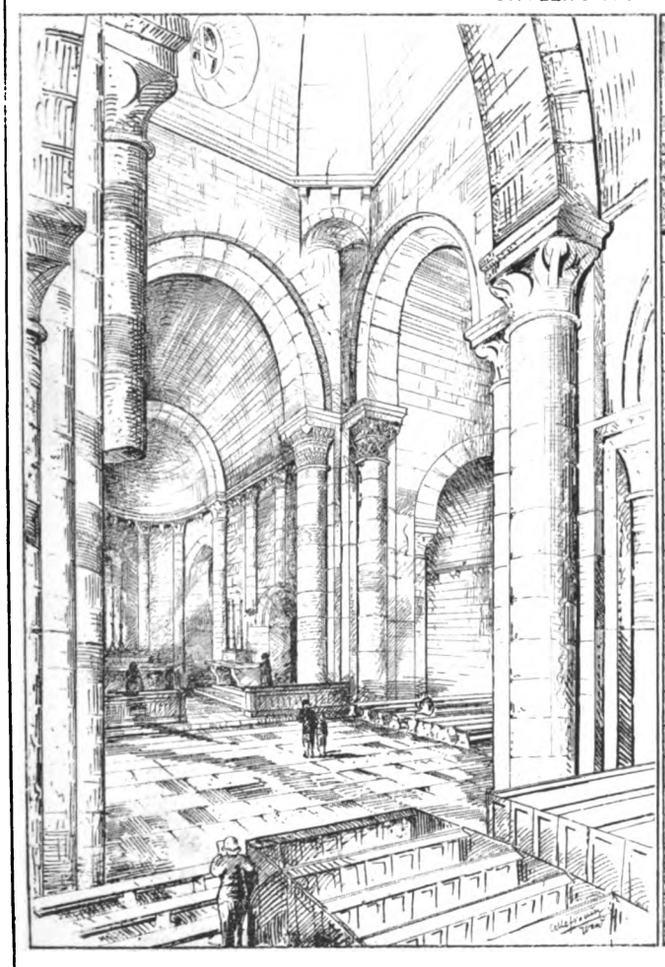
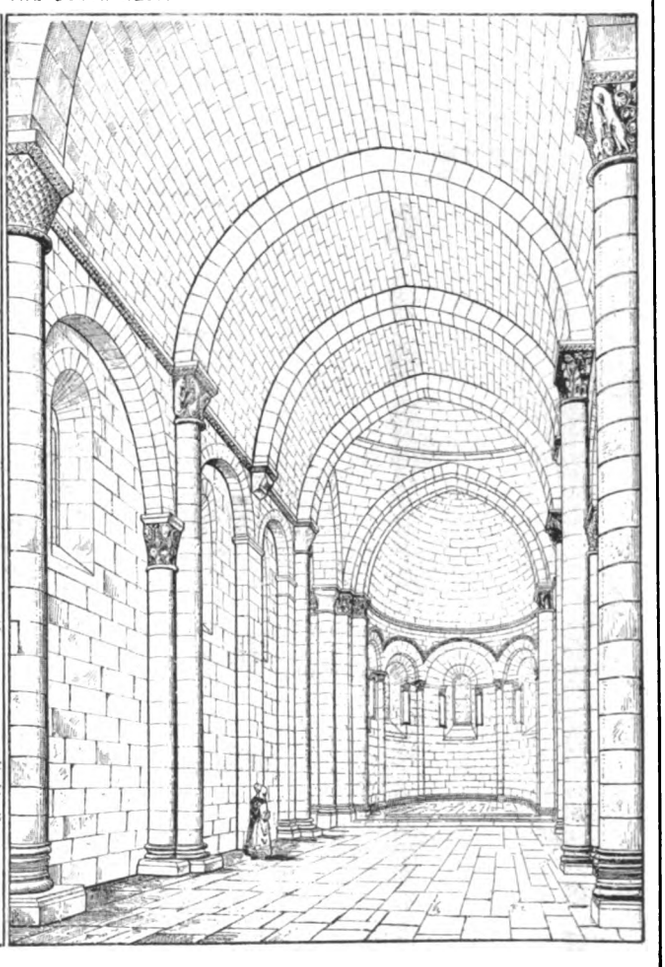


CHILLAC·FROM·THE·SOUTH-WEST.



CELLEFROUIN·FROM·THE·NORTH·AISLE·OF·NAVE·LOOKING·EAST.



MOUTHIERS, LOOKING·EAST.

Whiteman & Bass *Photo-Litho*

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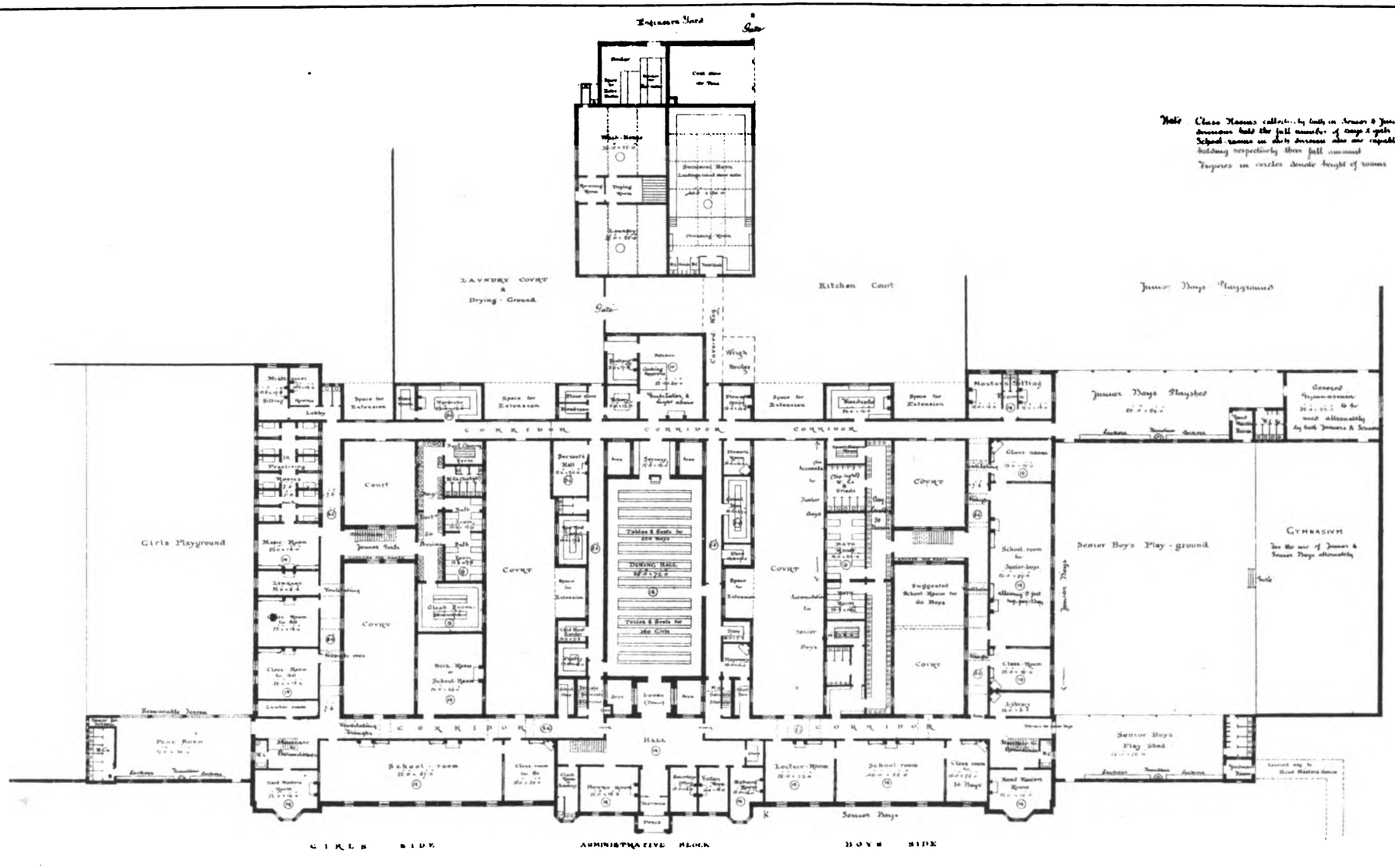

GROUND PLAN

SCALE OF 10 0 10 20 30 40 50 60 70 FEET.

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THE COMPETITION FOR THE HOUSE OF THE GERMAN IMPERIAL PARLIAMENT.

HERR THIERSCH'S DESIGN.

As we have observed on a previous occasion, no fewer than 189 designs, with about 2,000 sheets of drawings, were the result of the second competition, which was to give to United Germany the long-desired House of Parliament. With comparatively few exceptions, those designs represent a performance which calls forth the respect of those able to judge. But, as we have already pointed out, it is open to question whether the selected design in its exterior form is at all a worthy symbolical embodiment of the ardent aspirations of generations of Germans. The mistake, however, may be explained by the unusual nature and magnitude of the work which German architects were called upon to undertake. If, amongst all the designs sent in, there is not one which fully corresponded to the requirements of genuine monumental art, the reason is to be sought in the difficulties which beset the execution of the task. Architects were expected, as is too often the case, to make the best of a site offered to them, no matter whether its nature was at all in consonance with the conditions which the erection of such a monumental edifice imposed upon them.

It is necessary to recapitulate some of the instructions which were to guide competing architects in working out their designs. The portion of the Königsplatz set apart for the Imperial Parliament House forms a parallelogram 446 ft. long and 312 ft. deep, the limits of which were by no means to be exceeded. The two longest sides of the building are to face on the west towards the Königsplatz with the triumphal column, and on the east towards the Sommerstrasse. The northern and southern sides are bounded respectively by the line of street and the paths of the Thiergarten leading to the interior of the city. It is evident that this position points to the Königsplatz as the direction towards which the dominating principal front with a wide portico was to face. But as the traffic will flow towards the building from the other sides, it was impossible to place the regular approaches in its western front. As might have been expected, in not a few of the designs the Königsplatz façade was chosen for placing the principal portal, as being most suitable for displaying the most prominent architectural features of the edifice. Although this view may be more or less justified by the purpose which such a portal would serve on special occasions or as an approach for the court, it appears contradictory that the principal entrance should not be on that side of the building in which the most immediate and principal business of the house is carried on. But quite apart from this consideration, and whether the principal entrance be in its western or eastern façade, the architect had to meet another obstacle, the comparative narrowness of the site, which placed great difficulties in his way in freely developing his design on a comparatively short axis. In order, therefore, to obtain the required space for the prescribed covered vestibule, with adjoining cloak-rooms, the great sessions-hall, which would naturally be sought in the centre of the whole edifice, at the intersection of the two axes, and for the hall which is to serve as the lobby for the members and as a festal hall for special occasions, or for large committee meetings, many of the designs placed the principal entrances in the short façades of the building, preference being given to the southern side, that facing the Brandenburg Gate. The advantages of such an arrangement, again, are counterbalanced by the great drawbacks which are as difficult to avoid in placing the rooms along the longitudinal axis of the building as by their partial grouping in its transverse axis.

We have already freely criticised in these columns the design of Herr Paul Wallot, of Frankfort; but we refer to it here again because we wish to compare it with that of his rival, Herr Friedrich Thiersch, of Munich, whose design, as we have on a former occasion indicated, received also a first prize, but was not deemed worthy of the honour of execution. We give a perspective view of Herr Thiersch's design in the present issue of the *Builder*. The two designs are different, both in exterior form and ground-plan, and yet they have several features in common. They are both wanting in a portal having a claim to architectural importance, its place being supplied by plain semicircular-headed openings,—entrances they can hardly be called,—distributed over the four fronts, and cut, as it were, into the ground-story. This mode of dealing with a difficult subject, arises from a desire of obliterating, to some extent, the inferior position accorded to the Königsplatz façade. The place assigned to the sessions-hall at the intersection of two wings, by which disposition four courts are formed in the parallelogram occupied by the edifice, is the same in both designs. The latter also agree in assuming the principal entrances to be in the narrow fronts of the building. But only in the design of Herr Thiersch the entrance of the south front is, at the same time, the point whence the grouping of the rooms proceeds, while Herr Wallot proceeds in reality from the Königsplatz. To the two entrances of the narrow fronts, Herr Wallot adds here a third opening, direct into the vestibule and upon the principal semicircular staircase leading from it. Three open arches, in the centre one of which it is proposed to place the equestrian statue of the emperor, connect it direct with the festival hall. Passing through the latter, the sessions-hall, the "house," is reached, while the galleries behind lead to the refreshment-hall, placed in the Königsplatz front, wide corridors to the right and left establishing communication with the other parts of the building. One of the principal objections raised against this arrangement is that it lowers the festival hall to a mere passage, and shifts the sessions-hall from its proper position, the centre, towards the east, to where the cupola is placed. The latter is intended to supply light by day, while at night the hall is to be illuminated by the electric light throwing its rays also outwards. Something more imposing seems to be wanting on the western façade than the figure of Germania rising on a broad base, to counterbalance the cupola on the east.

In contrast to Herr Wallot, Herr Thiersch developes his plan, as already remarked, in the direction of the longitudinal axis. Upon the entrance on the south front follow spacious stairs, and upon the latter a hall, both of square form. On either side of the hall follow in the transverse axis, first a semicircular room lighted from above, and next an oblong room receiving its light from three large circular-headed windows, serving as reading and refreshment rooms, while, in proceeding from the hall in a straight direction, the sessions-hall, ending in a semicircle, is reached. This mode of grouping the rooms assigns the most important position to the festival hall, in the centre of the edifice, with the cupola above it, the "house" occupying a secondary position. The latter is shifted to the north, to a position in the building which outwardly is the least striking, the part of the façade inclosed by the centre and corner projectures. This arrangement evidently did not find much favour, but, in other respects, it seems the more preferable one. Herr Thiersch's design shares with that of his successful competitor this disadvantage, that, being placed central and lighted exclusively from above, no direct ventilation is possible. In both designs, the sessions-hall of the Federal Council, which, ideally at least, corresponds with that of the Reichstag, is relegated to the north-east corner of the building, which, in the case of that of Herr Thiersch's, is justified to some extent by the nearness of the "house," but in that of Herr Wallot's appears to be chosen perfectly arbitrarily. In consequence of taking up more space for vestibule, stairs, and central hall, Herr Thiersch proposed two stories above the ground-story, which is treated as socle, and thus his building would have been of higher elevation than that actually chosen. His design may be less attractive, but it appears to us that the sober earnestness of its forms agrees well with the compact features of the whole edifice.

The Polytechnic, Regent-street. — The syllabus of the evening classes now open here to the public is issued. Attention should be called to the practical trade classes, and also to the proposition to grant an "Industrial Diploma" to tradesmen who pass through a course of study combining both theory and practice, extending over three years. How this will work we do not exactly know. We are bound to confess we do not look with any particular favour on the self-created examining bodies which are bringing themselves forward.

THE DOMED CHURCHES OF CHARENTE.

THE "SHARPE MEMORIAL" VOLUME.

SHORTLY after the publication of this volume we gave a careful account of its aim,* finding it "honourable to those who have executed the memorial, and to him in whose memory it has been done." We also gave an account of the twelfth-century architecture of Charente, which is so well illustrated in the volume,—an architecture in which we find stone domes used instead of the cross-vaulting met with elsewhere at the same date. The book is the memorial of the Architectural Association to one of its members, who did good service to the world at large, and in the later years of his life conducted a number of members of the Association to different fields of architectural study, shared and directed their labours; and led the members to put their measured drawings, sketches, &c., into shape to be used, in the first place, as lecture diagrams, and afterwards, when reproduced by photo-lithography, as book illustrations. The plates in the volume are reproductions of the drawings used at the lecture delivered by Mr. Sharpe in June, 1876,—that is to say, of some of them, for the profusion of drawings put upon the walls that evening was such as has rarely been seen at an architectural lecture. A selection was made when the sixty plates of the volume were prepared. Some of the material as yet unused appears in the two pages of illustrations given in this number of the *Builder*. These illustrations will show our readers the class of work which was prepared after Mr. Sharpe's excursions, and the kind of plates they will find if they possess themselves of copies of the volume.

A few remarks may appropriately be made with reference to:—

1. *Plan.*—The churches are, for the most part, without aisles, and sometimes without transepts. Roulet is one of the most elegant of those which have a series of domes. A longitudinal section of this church is given in the work, and an interior perspective, &c. The tops of the domes appear to be worked to an even face, as though they had been intended to be seen externally, as seems to have been the case at St. Front, at Perigueux; usually in Angoumois they are rough, and covered by timber roofs. Domes were used for covering the centres of crossings earlier than as vaulting to naves. This, in the older churches, is of the barrel-vault form, either semicircular or pointed. Plassac is another example of a church without transepts. It is a church of a remarkable kind in many ways; the apse, the tower and spire above the dome, and the west front are very characteristic examples of the special features of the churches in this district. The spires are not steep, and are formed of stone, shaped so as to give the appearance of scales, presenting the idea of a fir-cone or pine-apple, and have thus obtained in France the appellation "*en pomme de pin.*"

Berneuil is a fine example. A solitary dome is put at the crossing, barrel-vaults being used elsewhere. The various modifications of the type of general plan in this church are given very effectively in the parallel of plans which forms plate 2 of the volume: a dozen plans, all to the same scale, appear there. At Puyperoux and Mouthiers are to be found examples of a direct communication between transepts and chancel, towards which there would seem some approach at Berneuil. At Puyperoux the idea of such communication is carried still further,—the north and south respond piers at the crossing are also isolated,—passages run behind them leading from the transepts into the nave. The plan of Berneuil calls to mind another feature seen in splendid development at Coudéon and Barbezieux. At Coudéon, some of the buttresses added to the earlier church are 12 ft. wide with 20 ft. projection, which, in a church of very moderate size and height, presents a very strange appearance. The large buttresses in this and several other churches were added at a period subsequent to their first erection to counteract the great thrust of the barrel-vaults. In the volume, a well-drawn view of the picturesque, but much altered and dilapidated, west front of Berneuil is shown. The very elegant original design of the twelfth-century west front is strangely modified by the addition of great buttresses at the angles and along the nave wall.

2. As to the *domes*, the reader must be referred

* See vol. xlii., p. 728.

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to the volume itself for a painstaking account of their structure, and a recital of the various conjectures with reference to their erection in this particular province. In the interior view of Mouthiers the dome is just seen, a very perfect dome slightly elliptical in plan. The arches are pointed, but very slightly so; this form of arch introduces a modification of the true Byzantine pendentive, which requires for its simplicity of form semicircular arches. The interior view of Cellefrouin (cellam Sancti Frontini, as the editors do not fail to note) shows a domical vault at the crossing springing from slightly cut-off corners supported by squinches; and the section of Châteauneuf shows a vault octagonal on plan, supported by squinches and corbels,—resembling Montbrun, shown by a view on plate 17. The squinches, carrying true circular domes, indicate early date; the pendentives proper are of later introduction.

This church of Châteauneuf alone, among those of Romano-Byzantine type visited during the excursion of the Association, has side aisles, and the arches are acutely pointed; a section is given, plotted from measurements, on plate 3. From the sketches in this number, the stately simplicity of some of these churches can be judged. Cellefrouin is a fine masculine specimen of rather early Romanesque; Mouthiers is for the most part of the late Romanesque or early Transitional periods,—all the arches of construction in it are pointed, whilst those of decoration are semicircular.

3. Two *west fronts* are shown in our illustrations. The greater part of the church at Chillac is practically ruinous. The barrel-vault of the nave has been too heavy for the walls, and the cupola of the crossing is cracked. The west front is without the original termination, which has shared the fate of several other upper stories in the churches visited. The church at Chalais has a really magnificent lower story,—a large central portal with five orders in jamb and arch, and arches at each side of it; but the rest of the front is a blank wall. Chalais has several plates devoted to its illustration. The fronts appear usually to have marked the completion of the work, and to have received the greatest share of ornamentation. Usually the capitals are richly adorned with figures or foliage, and across some of the fronts is carried a rich, broad frieze, continuous with the capitals of the ground-story arcade. At Chillac the second story is divided from the ground story by a fine corbel table. At Dirac, about seven miles south-east of Angoulême (the headquarters of the excursion in 1875), the west front is of the same type as that at Chillac, but with differences of detail. All the fronts of this type suffer from the smallness of the angle piers. In the other type of treatment, of which the very beautiful desecrated Cistercian Abbey Church of Châtres (near Cognac) is an example, the mass at the angle is somewhat increased by large vertical shafts being carried up from the ground to the string-course at the starting of the gable. The fine front of Lanville also has large shafts, which are repeated on each side of the central doorway; and from these shafts arches are thrown across in the upper portion of the second story of the front. The details and general form of this front render it a very interesting one, but the angles, albeit strengthened by the shafts, do not gain the quality of solidity which is of much value always, especially when wall surfaces are well filled with arcades.

4. The illustrations of the *ornamentation* fill a goodly number of plates in the volume, and are most of them admirably drawn, some drawings being really exquisite in touch. "The extraordinary richness of the ornamentation in the province," said Mr. Sharpe in the lecture before referred to, "is a most remarkable characteristic. It is of two kinds, firstly, figures of men, animals, and birds, and nondescript compositions of all three; and secondly, of foliage only. The first kind is more or less barbaric, the latter very rich and pure. As regards the *chapiteaux historiés*, although there may be some deeper meaning in them than at first catches the eye, they more probably indicate the familiar struggles of the inhabitants in battle or in the chase than any allusions to Biblical texts." The stag-hunt and battle-piece given in plate 41 may well have been in the mind of the lecturer. The small capital with the bird in our illustration is from the apse of Plassac, of the exterior of which there is a good drawing in plate 25. The other capital is from the Church of St. Hilaire, at Poitiers, brought in here as a reminder of the similarity in general expression between the Romanesque capitals there, and those further south, at Cellefrouin (plate 13), &c.

We may add to our previous notice that the "Sharpe Memorial" is 12 in. by 10 in.; and that, of the sixty plates, eighteen are devoted to measured drawings, plans, sections, and elevations, nine to exterior views, six to interiors, and the remainder to details. A map of the department is prefixed to the text, which extends to forty-eight pages,—that is, the text with reference to Charente. The purely "memorial" part of the volume is put at the commencement, and terminates with a very careful and complete list of Mr. Sharpe's publications, filling eight pages, in itself a memorial which might be reproduced with advantage for insertion in copies of his works. We remember with some satisfaction the assistance given by the *Builder* by publishing the list so that it might have the advantage of critical testing when improvement was possible. Messrs. Birdsall & Son, of Northampton, deserve mention for a very refined piece of book-binding, with coloured inlays and admirable tooling, both blind and in gold. The subscription price of the volume is a guinea and a half, and there are still a few copies beyond those subscribed for by members of the Association.

The honorary treasurers of the publication fund,—Mr. John Quilter, of 10, Brunswick-square, and Mr. S. Flint Clarkson, of 36, Great Ormond-street,—will no doubt be glad to see the remaining copies reach public libraries or the hands of students. The task, commenced fully five years ago, will then have been well completed in all respects.

ART AND ITS INFLUENCE ON THE MASSES.

IN the Art Department of the Social Science Congress at Nottingham (presided over by Mr. G. Aitchison, A.R.A.), one of the special questions for consideration was, "In what way can the influence of art be brought to bear on the masses of the population in large towns?" The first paper read was that of Mr. T. C. Horsfall. In the course of his remarks, the speaker contended that a strong love of beauty was, as a rule, gained only by those who, in childhood, habitually saw beautiful things, had many pleasant associations with them, and were taught to perceive their beauty by persons whose opinion they cared for; and of those who had gained sensibility to beauty, many lost it if they ceased for a long time to see beautiful things and to think about their beauty. Many of the children who live in large towns had no chance of becoming familiar with birds, flowers, grass, ferns, trees, or any other beautiful things; but most town children saw such things occasionally, and as they saw them chiefly on holidays, probably they had some pleasant associations with them. If love of art was to be common among the people of large towns, the slight acquaintance with beautiful things thus gained must be increased by the help of art. Good coloured pictures of common birds, flowers, trees, butterflies, country lanes, farmyards, coast scenes, that is, of the beautiful things and places which town children saw in town parks and when they go out of town, should be placed in every school, and the attention of the children should be directed to the pictures by brief addresses and by labels containing brief explanations, so that when they saw any of the things represented they might look at them more carefully, and come back to the pictures with more interest for having seen the things. There should also be pictures of historical incidents and places mentioned in the children's lesson-books. To induce attention to, and interest in, art-methods, coloured plates and good woodcuts of the same objects should be placed side by side, and the differences in the modes of representing form and colour in different arts should be pointed out. Full descriptions of wood-engraving, etching, and other processes, with all the appliances used in the processes, should be placed in an art gallery in the town, and the fact that they can be seen there should be stated on the labels attached to the woodcuts, &c., in the school collections. Each collection should contain a few examples of well-shaped jugs, cups, &c., which should have labels stating that they are well shaped, and each school should have a large glass case for growing plants, and at least two casts from sculpture, showing what the bodies of men and women ought to be like. When chromolithographs were used in school collections, each should have a label referring to a good picture of the same subject in the art gallery. The central art gallery ought to be opened on Sundays, and, to induce workpeople to come to it often, music ought to be given in it on one or two evenings every week. As good art was essentially right beauty of appearance, if we wished busy people to care for it, we should show it to them applied to things which they cared for. One principle of great importance was almost entirely disregarded by managers of art galleries. To make people take a keen interest in art, we must show them things that really interested them. Judging from the language of many people, one would think they placed the greatest value on things the most worthless. Success in bringing the influence of art to bear upon the masses would only be attained by persons who knew the importance of art, and of the right appearance of the whole life, which was of more importance than what was usually called art. Rightness of appearance was of far greater importance than things which did not deeply influence human feeling. In the art gallery there should, therefore, be a model small house, to show how a small house in town can be made to look pleasant, which should contain all the things which are needed in such a house, all well made, of good form and colour, and it should have on its walls a few good pictures. The gallery should contain a small collection of casts from the best Greek sculpture, and good examples of the products of all the industrial arts. Each should have a label stating that it is good, and, if this be possible, explaining why it is so. Some of the pictures in the gallery should represent the most beautiful places near the town, the most interesting buildings in and near it, interesting events in its history, the trees, flowers, birds, butterflies, &c., to be seen near it. Of pictures of this kind copies,—photo-engravings, etchings, good chromo-lithographs,—should be made. Framed examples of the copies should be shown in the gallery, and the price of a copy and of a frame should be stated on a label. Similar labels should be attached to other good etchings, engravings, &c., in order that workpeople may learn how many kinds of good art can be obtained at a small cost. Every picture should have an explanation of its subject, and if the subject be one which is not familiar to most people, its connexion with familiar things should be pointed out. To encourage study of art-methods pictures should be placed side by side with etchings and other copies of them, and groups should be formed of representations by different kinds of art of the same subject. Mr. Horsfall, adverting to the subject of female dress, urged that ladies should be induced to dress more neatly, and with a truer sense of beauty. When appearing in public they should wear a dress which could be obtained by poorer women. As comparatively few people saw the need of the objects for which they were working, it necessarily fell on a smaller number of persons. By the masses of the population acquiring a knowledge and love of art, we would obtain more and better designers. It was surely unquestionable that the knowledge and love of art was indispensable to our population. Religion was one of the strongest motives to resist temptation, but it behoved them to declare the truth that thousands must be incapable of just feelings unless they first felt the influence of art, unless by the help of art the beauty of the world could be brought within their reach. The masses required more interesting recreations for their leisure time. Till then he did not think any great change would take place in the way they spent their time. The speaker concluded by urging that the work should be undertaken by all who desired the welfare of the working classes of the country.

Mr. Judge (in the unavoidable absence of the author, Mr. Hodgson Pratt), read a paper on the same subject, strongly advocating the opening of museums and art galleries on a Sunday.

The President having invited discussion,

Mr. Statham said they must have been struck with the exceedingly practical way in which the question had been handled by Mr. Horsfall's paper. There was one idea in his paper which was also touched upon in that of Mr. Pratt, and that was the great effect of bringing objects of art before the people as a means

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of cultivating their taste. With regard to the remark that a knowledge of art was necessary to the cultivation of religion, he suggested that the two things might go together. History might be quoted against them to show that the most artistic periods were the most immoral that ever existed. Why, he could not say. They heard a good deal of affording the people the sight of well-shaped objects, but, he asked, how were they to decide what were well-shaped objects and what were not? It could only be done by people accepting a certain style as to the right thing. He strongly advocated the cultivation of a moderate knowledge of drawing. Nothing would be of so much influence as increased facilities for the teaching of drawing in primary schools.

Mr. Hill, in stating his objection to the opening of museums on Sundays, said it would have been desirable if the question had been put down on the paper. His objection was that the Sunday opening was not necessary. Working people had been able to obtain the Saturday as a half-holiday, and one great argument in favour of the half-holiday was that the museums, &c., were closed on Sundays. Supposing they were open on Sundays, employers would say "You can go on Sunday to the museum. You don't need to leave work." Working men felt that if the museums were opened on Sundays they would be inflicting injuries on the masses of the people. Taking Nottingham, for instance, would any one say that any considerable number of people could not on the week-days avail themselves of the opportunities given them for the inspection of art-treasures? He argued that the feeling of the working classes was wholly against the opening of museums on Sunday.

The President drew Mr. Hill's attention to the fact that the question raised by him was a merely accidental one, and not the question under discussion. He would ask him to be as curt as he could on the question of Sunday opening, and touch upon the influence of art upon the people.

Mr. Councillor Jacoby inquired whether, if the question of Sunday opening were discussed, he would have the right of reply.

The President had no objection to the speaker making remarks on the question when the previous speaker had done.

Mr. Hill, resuming, thought the question should be fairly ventilated, as there were two papers on the subject. Why, he asked, should they stop at the opening of museums on Sundays? Why should not the Crystal Palace be open? (A Voice: It is.) Why not the Polytechnic, the opera, the theatres? Our day of rest would be like what prevailed on the Continent. That was the tendency of the movement.

Mr. Councillor Jacoby said that having made the Sunday question his own, and having brought it two or three times before the Nottingham Town Council, he could not allow the remarks of the last speaker to pass unchallenged. All who endeavoured to make museums popular with the working classes found that Sunday was the only day on which they could go to institutions of that character. They found that they had most leisure on the day that they left off work. As to employers endeavouring to rob the working classes of the Saturday half-holiday, he would leave the trade unions to look after that. In regard to their own Castle Museum, the attendance had exceeded their most sanguine hopes. In Manchester the experiment of opening institutions of this kind on a Sunday had been attended with the greatest success.

Mr. T. C. Hine urged that an improvement in street placards would tend to the cultivation of beauty. In regard to the two papers which had been read, the object was to show how the love of the beautiful could be influenced for good.

Mr. Rathbone strenuously advocated the opening of museums on Sunday, from that being the only day the working classes could enjoy them. He contended we had no right to close museums to that portion of the working classes who made use of them. He ridiculed the objection raised by Mr. Hill as the eternal "thin end of the wedge." The answer in this case was very simple. If it were asked, If we are to open museums, why not shops? the reply was that the majority of the nation desired a day of rest. If one man opened his shop on Sunday it would necessitate other men opening theirs. The minority would, therefore, force the majority to do what they wished. There was no compulsion in the matter of the opening of museums. Those who did not think it right need not go.

After some remarks from Mr. Wright, who advocated the development of illustrated newspapers,

Mr. Horsfall moved "That this section recommends that the Council request the Science and Art Department to seek to acquire the power of preparing and of selling at cost price to persons or societies interested in education, representations of trees, birds, and other beautiful natural objects, good in respect both of fidelity to nature and of artistic quality."

Mr. Judge, who seconded the motion, spoke warmly in favour of Mr. Horsfall's paper. He contended that if the influence of museums was good it should be extended as wide as possible, and that it was not sufficient that they should be open to working people on Saturday afternoon.

Mr. Horsfall, briefly replying to the remarks made, said he did not say that a knowledge of art was necessary to religious feeling, but people could not be expected to have healthy and just feelings unless they gained knowledge through art. He did not think it possible for people to form an idea of the utter ignorance which prevailed among working people as to healthy views of life.

The President, in a few closing remarks, said it was of the highest importance that we should endeavour to give to every person as much pleasure as possible in the walk of life which he had to fulfil. He thought we could do a great deal more. We must devote a certain portion of our time to earn our living. We might reduce that, and he hoped to see the time when a similar portion was devoted to art. It was very important that young persons should have their eyes cultivated to perceive forms of beauty. The Greeks, who were the greatest artists the world ever saw, took the greatest possible care that people should be surrounded with objects of beauty, and he thought we should do more in that direction. There were few objects in nature which caused repulsion. In conclusion, the speaker suggested that we might combine pleasure with utility by teaching children to draw simple things they saw before them.

THE PRESERVATION OF LIFE AND HEALTH.

SANITARY INSTITUTE AT NEWCASTLE-UPON-TYNE.

THE address of Captain Douglas Galton, C.B., as President of the Congress, contained a large number of valuable facts, and deserves the greatest consideration. The host of congresses which are being held at the same moment makes the space scanty that we can afford it. We print, however, a small portion of it towards the close:—

The death-rate affords to some extent an index of the disease-rate in the community. It is, however, very difficult to ascertain with any degree of accuracy the disease-rate of a community, as compared with the death-rate.

If we take the army as a criterion, it would seem that there are more than a hundred men admitted to hospital to one death, whilst the number constantly sick averages from four to six times the number of deaths. No doubt in the army many an ailment has to be treated in hospital which in ordinary life would allow the sufferer still to pursue his vocations.

The sickness of the population is not registered, and it is very difficult to obtain any data respecting it. It has been generally stated that there are on an average twenty cases of sickness to one of death, of which four cases out of five are of children. I find, however, from a return of an unsanitary district in St. George's-in-the-East, that with a death-rate of 31 per 1,000, the sickness-rate was 270 per 1,000, or nine cases of sickness to one death. But in the worst parts of the same district the sickness-rate amounted to 620 per 1,000, which gives twenty cases of sickness to one death.

Mr. Neison, who has recently examined the records of the Ancient Order of Foresters, shows that at thirty-five years of age there are on an average twenty-two cases of sickness to one death, and that is in a body of men which it must be borne in mind are selected men so far as health is concerned. From the same record we find that at twenty years of age the loss of time from sickness amounts to 1·5 per cent. of the whole time; and at forty years of age it amounts to 2·6 per cent.

The value of a single premium paid at 20 years old (calculated on the 3 per cent. tables) to insure 1*l.* a week during sickness, for the whole life, is 40*l.*

I sought, but failed to obtain, definite statistics on this subject from some of those who are working amongst the poor, both in the east and west end of London.

An East-end clergyman remarked that "the poor go on living wonderfully in wretched places, but that they have so much ill-health. They are perpetually on the trudge to the hospitals with their bad chests and bad legs, and get patched up again and again, and live on." Our London hospitals and dispensaries cost, according to Mr. Burdett's statistics, nearly 600,000*l.* annually to administer. The average number of out-patients treated at the various institutions in a year is about 1,000,000,—that is to say, more than one out of every four inhabitants of the metropolis becomes an out-patient in the course of the year.

This expenditure is incurred mainly for the purpose of patching up the wretched poor, who have been injured by bad drainage, want of ventilation, darkness, &c. Though drink may be one of the immediate causes of many hospital cases, yet the tendency to drink is created and fostered by the wretched dwellings of the very poor. But besides the time lost by the sickness itself, there is the large amount of time wasted by the poor in going to and waiting at hospitals, which would be spent by healthy poor in labour.

There is, moreover, the great amount of lassitude and idleness in the low-class poor, which Dr. Richardson traces to want of ventilation, in their own and former generations.

I think we may safely assume that if you can, by preventive arrangements, bring down the death-rate of the wage-class to the standard afforded in good sanitation, you would reduce the sickness-rate in a similar proportion at least. By means of this item alone the wage-earning power of the industrious classes would be enlarged by some millions of pounds, and their comfort correspondingly increased.

You would effect, in addition to the savings under this head, certain other distinct economies. For instance, it is certain that the need for much of the accommodation in our prisons, reformatories, and workhouses arises from evils incident to unhealthy circumstances and crowded dwellings.

We shall probably be led to appreciate more fully the advantages of good sanitation if we can arrive at putting a money value upon some of the more direct results of sanitary improvements.

In the first place, the community derives a direct advantage from adopting such a system for the removal of refuse as will enable it to be applied directly to improving the cultivation of land. For whilst, on the one hand, the rapid removal of refuse from the neighbourhood of dwellings by the efficient sewering of towns results in improved health, the application of sewage to land by the irrigation of growing crops affords both a means of fertilising the land, and of cleansing the fluid, so as to place it in a fit condition to pass into the streams.

My friend Mr. Chadwick asserts that where the sewage is undiluted with rain-water, and where it is utilised at once, and carefully applied under favourable conditions, an acre of land ought to absorb the sewage of 100 persons, and that the crops on this area should feed five cows; or, if put in another way, that the produce of ordinary cultivation being represented by 1, and market garden produce by 3½, the produce of sewage cultivation should be represented by 5.

I have obtained some recent facts on the direct application of sewage to land which, although they do not show such high results, deserve attention.

Mr. Brundell, who has the management of the Doncaster Sewage Farm, states that during nine years he has never applied any other manure than sewage. That this year the crops are the heaviest that have been produced, and the land remains just as capable of receiving the sewage as it ever was, and does not "tire." Mr. Collett, of the Bedford Farm, says that their produce is generally much above the average of the neighbourhood, and that the crops are as good or better than they were seven or eight years ago; and the land under sewage treatment has improved in quality. . . .

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In the next place, the diminished death and sickness rates, and the greater length of life entailed by good sanitation, afford direct pecuniary advantages.

Let us apply this reasoning to the population of the improved artisans' dwellings in London. These now accommodate about 11,000 families.

In many of the districts which are now covered by these improved dwellings, the death-rate in the wretched homes which have been removed varied, as I have told you, from 35 to 40, and even 50 per 1,000. Mr. Gatliff shows that there are nearly five in a family, on an average, in model lodging-houses. There has thus been a saving of life to the extent of at least 20 per 1,000, by the erection of these dwellings, on the 50,000 persons inhabiting them, or about 1,000 deaths annually. And if we take the estimate of sickness which I arrived at above, there would be a reduction in the number of cases of sickness which occur in the population of these dwellings of at least from 15,000 to 20,000.

The cost of the improved dwellings appears to have averaged a little over 170*l.* each, or about 1,900,000*l.* for the 11,000 families.

By the light of these various data we may obtain some idea of the actual pecuniary advantage to the community which results from the improved health of the occupants of such dwellings. The cost of funerals has been stated to average 5*l.* apiece. Under this head, therefore, the saving may be taken to average 5,000*l.* a year; the diminished loss of the sickness of the 11,000 heads of families alone may be assumed to average another 5,000*l.* a year; and in addition to this there would be the saving in time and money, in seeking medical attendance, of the wives and children who make up the remaining population of the dwellings, as well as the increased power of earning wages afforded to the mothers of families from the diminished sickness of the children.

Hence the money benefit to the community thus made up, which is caused by the diminished death-rate and sickness-rate, would form an appreciable item in the percentage of interest paid on the 1,900,000*l.* capital expended in the construction of the dwellings.

But there is another way in which we may estimate the economy to the community resulting from the increased health which has been obtained in these dwellings.

The analysis of the mortuary rates for Westminster showed that the mean age at death of the males of the wage classes in Westminster, who had survived the period of youth, and died after 20, was 47·6 years.

The rate of mortality in the Improved Dwellings is from 14 to 16 per 1,000. The rate of mortality in the rural parishes of Northumberland above mentioned, in the years 1877-81, was 15·3 per 1,000; and in Dover in 1880, it was 16·7 per 1,000. It will not be unfair, therefore, to take the mean age at death of the males who died over 20 in the rural parishes of Northumberland and in Dover as a standard, which may be reasonably expected, for the duration of life of the males who die over 20 years of age in the Improved Dwellings. This was, for the rural parishes of Northumberland 60·9 years, and for Dover it was 57·8 years. That is to say, from 10·2 to 12·3 years, or a mean of 11 years additional duration of life may be expected for the heads of families occupying the Improved Dwellings, beyond that enjoyed by the wage classes who do not live in such favourable surroundings.

Therefore, we may assume as a profit to the community the increased earning power of the occupants of these dwellings, due to this increased expectation of life. It would appear from Mr. Neison's tables that six per cent. would be a full average deduction for sick time between 47 and 58 years of age; and we may, therefore, safely take the increased earning power as that due to an additional 10·4 years of life.

If, in order to form a rough estimate of the money value of this, we assume that each of the heads of the 11,000 families receives as a present on his admission to the dwellings a grant of ten years more life, and calculate its money value on the earnings of only 1*l.* a week, we find that upon a four per cent. table the present value of ten years of increased wage earning power at 1*l.* per week would be for 11,000 heads of families 4,640,000*l.*, or nearly two and a half times the cost of the property.

By considering the question in this way, we arrive at an understanding of some of the direct pecuniary advantages which accrue to the nation from those sanitary improvements which lead to a decreased death-rate and sickness-rate; and we see that, however large may be the cost of the removal of bad dwellings, and the substitution in their place of healthy well-planned dwellings, the actual money gain to the community far exceeds the expenditure in money.

But it is not as a money saving alone that the question must be considered. Its social and political bearings are even more important.

The nation is made up of individual items. The goodness and the happiness of the nation depend upon the individual. Well-regulated family life does more to make up individual happiness than any other form of life. But family life is impossible in the wretched homes which have been permitted to exist in most of our large towns, and many of our rural parishes. These wretched homes drive the population into the streets, and into the gin-palaces, and into the public-houses. They engender sickness, which entails poverty, and they foster crime.

The improved dwellings, on the other hand, ensure improved health, and by thus affording a security for the more continuous earning of wages, create the possibility of a comfortable home. I was much struck, when in the United States of America, with the fact that the artisan and wage classes, in many manufacturing towns, lived in very comfortable houses, in which each family had their parlour, with appropriate furniture, pictures, and often their piano. They had come to look upon these things as a necessity; and this is an evidence of the general civilisation which pervades American society. By civilisation I mean the education and the general well-being of all classes.

In this country our most advanced sanitarians have long endeavoured to impress these doctrines on the public, and I am happy to think that at last they are beginning to bear some fruit; for, in order to develop morality, contentment, and happiness among a people, it is essential that they should be provided with healthy and comfortable homes.

HEALTH QUESTIONS AT THE NOTTINGHAM CONGRESS.

THE Health Department of the Social Science Congress at Nottingham was presided over by Sir Rutherford] H. Alcock, K.C.B., who, in the course of his address, said he doubted if there was a word in the language of so deep a meaning as the word "health." On it depended not only the duration of human existence, but the power of active exertion and enjoyment, often more highly valued than life itself. "Health" was a term difficult to define, but for all practical purposes, however, they might, perhaps, be content with knowing that it implied a state or condition which allowed full play to all the organs and component parts in due subordination and harmonious action. Yet few precious things were so persistently neglected, so rashly imperilled, or so wantonly thrown away. And as regarded whole nations or communities, few objects of public interest met with so little attention. How was it that the history of all sanitary progress in this country was that of a continuous struggle against prejudice, ignorance, and vested interests, separately or collectively opposed to the measures best calculated to safeguard and promote the public health? The antagonistic forces to be met were not difficult to define, and they might be ranged under a few heads. Putting aside such exceptional cases as those of the Peculiar People or the Anti-Vaccinationists, they might reduce the ranks of the opposing force to those who objected to the sanitary legislation required, either on the ground of a distrust in the power to effect any material change in the average mortality, which they believed was regulated by laws beyond man's control, or on the ground that any compulsory legislation would be an undue interference with the personal liberty of the subject or the rights of property and vested interests. The liberty of the subject had always been used as the stalking-horse of the opponents of reform and improvement, and might be pleaded for the liberty of carrying a lighted torch among neighbours' hay-ricks, or an open lamp in a coal-mine, or smoking a pipe in a powder-magazine, or, in fact, any other act of insanity or recklessness, to the imminent danger of a whole community. In itself it was an argument of little value. So long as the health or life of an individual alone was concerned, as in diseases which were neither infectious nor contagious, each one might claim some large discretionary right to decide whether either the one or the other be worth preserving, and refuse to the State or to others any power of deciding. But even as regarded that the State did assume, in the case of suicidal acts, both the right and the power to interfere with the individual. But it was a wholly different matter when a person was attacked by an infectious and death-spreading disease endangering the health and lives of others, and the interests as well as the safety of a whole community. The adoption of compulsory measures of isolation and disinfection became then an act of self-preservation and public policy which no pleas of public liberty could be allowed to stand in the way of, or otherwise prevent the most prompt and effective action; for the multiplication of centres of infection gravely compromised the health and lives of a whole community, and with it the wealth and prosperity of the country. Mr. Edwin Chadwick had recently told them that he always found in his local inquiries that the seats of epidemic disease—the results of bad sanitary conditions,—were the seats of irritation, of disturbance, and of crime. The indissoluble connexion between the physical and moral law was fully demonstrated in the origin and progress of epidemics. A population crowded into dilapidated houses, ill-drained and ill-ventilated, not only grew feeble and enervated, and predisposed to receive infection, but by the same process they became demoralised in body and mind, and dangerous subjects. Mr. Chadwick, dealing with the economic aspect of the question, in his paper read at the meeting of the Association in Dublin last year, said that the total loss to the wage-earning class by the loss of work through sickness had been estimated by Dr. John Watts, who had had great experience in friendly societies, at 13,000,000*l.* in the course of a working man's life, and referred to the report of the Local Government Board for 1880-81, in which it was stated that the death-rate of England and Wales had fallen during the last decade by nearly 4¼ per cent., showing by a rough estimate that about a quarter of a million of persons were saved from death who would have died if the death-rate had been the same as in the previous thirty years. Thus, if twelve cases of serious but non-fatal cases be reckoned for every death—and the early estimate was greater,—it followed that about 3,000,000 persons, or over one-ninth of the population, had been saved from a sick bed by some influence at work in the past decade, which had not been in operation previously. As regarded our Navy and Army, which cost us about one-third of the whole revenue raised by taxation, it would be found that far more were struck down by sickness than fell by the sword. There was to be found within seventy-four pages of the Registrar-General's annual report, condensed in tabular form, a record full of instruction and of absorbing interest, giving the sum of all the ills to which the flesh is heir from disease or violence. In looking over those returns he could not but come to the conclusion that though many of those ills were irremovable, others were certainly preventable. Of the first class, at the head, stood endemic diseases, or those peculiar forms of disease which arose spontaneously, as it is termed, in a country or particular locality, of which goitre in mountainous countries was perhaps the most striking example, existing, as it did, in every quarter of the globe where mountains were physical features, and the ague in all marshy countries, and the plica in Poland. Yet sanitary science could materially alter these, and so effect what medicine could not. Cesspools and sewage might be removed, and sewers might be ventilated and flushed, and all the foul and deadly gases generated in them diverted from inhabited houses by trapping and other means. But placed at the head of all the specified causes of death, were those of the zymotic class, that is, diseases which prevailed among a large number of the people of a country, raged for a certain time, and then gradually diminished and disappeared to return again at periods more or less remote. From that group came all the epidemics from which we suffered from time to time. The whole group constituted a class of

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diseases which might be distinguished as essentially preventable. Upon the cardinal point of the power of isolation to arrest the spread of infection the evidence was absolutely unanimous, showing that such isolation almost invariably answered its purpose. In order to insure such isolation, legislation was needed, and the compulsory notification and isolation of those infected must form essential provisions of any effective legislation. Nothing short of this could suffice.

One of the special questions for discussion was, "What Reforms are desirable in the administration of Hospitals?" Dr. T. Gilbart Smith read the opening paper, in which he indicated many changes which he deemed to be desirable, and said that, having regard to the complications and difficulties which surround this question, and to the necessity for efficient reorganisation, there could be but one opinion, namely, that a full, wide, and searching inquiry into all its bearings can only be obtained by the appointment of a Royal Commission.

Mr. F. S. Powell moved, and Dr. Cameron, of Dublin, seconded:—

"That this department, deeply convinced of the necessity of reform in the administration of metropolitan hospitals and other institutions for the medical treatment of the sick, requests the Council to continue their exertions to obtain the appointment of a Royal Commission, with the view to obtain reliable data upon which reforms should be based, and make such recommendations as may appear desirable."

After some discussion the resolution was put and carried.

Sir J. Pope Hennessy made a short statement on the Chinese system of collecting sewage and placing it on the land. The advantage was the freedom of the Chinese from typhoid and the diseases generated by sewage-gas. The disadvantage was that it was not pleasant to be in the fields at the time the nightsoil was being distributed. A conversation followed, in which Dr. Little, of Liverpool; Mr. Tarbotton, of Nottingham; Alderman Ford, of Nottingham; Dr. Hill, of Birmingham; and Sir R. Alcock took part.

Smallpox epidemics, as affected by the states of war and peace, were discussed in a paper by Dr. William A. Guy, F.R.S. A series of curves accompanied the paper, in which the leading facts were represented; and attention was specially directed to the figures and curves of the years 1796 and 1871,—years in which Paris (our near neighbour) was suffering from the worst effects of war, aggravated by domestic discord. War was rather an aggravation of evils already existing among the peaceful populations from which its fighting men were drawn, than a thing altogether *sui generis*. The progressive decrease of mortality by smallpox, so characteristic of the nineteenth century (for no such decrease had occurred previously) was not occasioned by the transition from war to peace, but it began in the years of war, and continued during the years of peace. As the seventeenth and eighteenth centuries afford no other example of a decreased mortality so progressive and so considerable, we are forced to conclude that some new and powerful cause, or combination of causes, acting continuously and with ever-increasing force, must have come into operation in the early years of the nineteenth century. Vaccination replacing inoculation, and extending its protective influence to an ever-increasing section of the population, is the only force which fully meets the conditions of the problem.

DAVOS-PLATZ.

THE Frauenkirche at Davos has little to mark its date except an apsidal east end. The body of the church is said to date from 1240, and the miniature tower and wood-shingled spire of the same date yet remain at the north side.

About 1560-70, *i.e.*, some years after Zwingli's thunder at Zurich, a large tower with shingled spire was added, and forms the only architectural feature of value in the landscape of this Alpine valley. In point of size it is out of proportion to the little church of which it forms now a part, and was probably built to mark the final freedom from Austria of the little Davos district.

I must call attention to the beauty of the spire. It is not twisted bodily like Chesterfield and some on the Continent, but has to each face a singularly graceful surface-spiral, or, rather, portion of one. In colour and texture of shingle it is equally beautiful. Tower and spire together have a certain Rhenish character, mainly produced by the steep gables which terminate the tower walls.

There are two bells, one 3 ft. 3 in. diameter, the other 4 ft. 3 in. The latter is a tenor of singularly fine tone, cast at Poschiavo in 1681, as its inscription testifies, "Pavio Antonio Gaffori *von Pushlof*." It bears also the arms of Davos,—a species of Robinson Crusoe with a spiked Swiss club.

The name of Buol occurs in Davos history in the sixteenth century, and a descendant of the family still keeps the hotel which bears his name.

The place itself is 5,105 ft. above sea level, with a singularly fine, dry, clear, bracing, atmosphere, and is becoming a great winter resort for invalids. Seeing what a harvest Death the Reaper has lately garnered of the leading English architects, I commend it as a holiday resort to those who survive.

EDWARD ROBERT ROBSON.

Innsbruck.

BISHOP STEERE.

As one who knew the late Bishop Steere intimately from the time we were schoolfellows together, and as one deeply interested in the new building called the Cathedral at Zanzibar (the bishop always called it "Christ Church"), having made all the designs for it myself, I feel impelled to add a few words to the excellent statement of his life and work which appeared in the *Times* of the 19th inst. The bishop is there spoken of as a "bold man" because he was his own architect, and it is added that he felt himself equal to the task. I think I alone can fully appreciate this, inasmuch as the bishop came to me as to an old friend with his original ideas, and, bringing his crude sketches with him, asked me to undertake the task of designing the building therefrom, putting the whole into a proper architectural form. This was done, and, therefore, the boldness referred to was less than the wisdom which sought and accepted help in the form which was needed. Subsequently, the bishop himself superintended the whole of the work on the spot; had put together, under his own eye, the centering for the vaulted roof which I had caused to be made and sent from England, as well as the marble work for columns, &c., stained glass for windows, font, and altar-piece of marble and mosaic.

These sketches I have referred to were no surprise to me, as we had gone together in small church-hunting excursions many years ago, he studying the glass and such internal details, while waiting for the conclusion of my architectural study of a building, neither of us dreaming how, in after-life, such studies would blend together in forming a distant edifice,—a church on the slave-market at Zanzibar,—and scarcely less so when, on his first appointment to the living of Little Steeping, he called on me to build his parsonage, and subsequently the schools, after his first visit to Zanzibar.

C. FORSTER HAYWARD.

PROPOSED TIDAL BATHS AT BRIGHTON.

AT the meeting of the Brighton Town Council, on the 20th inst., the Works Committee submitted a special report with reference to the improvement of Madeira-road (the road which skirts the beach at the foot of the Marine Parade). It comprises a report to the committee by the surveyor, a recommendation, a form of advertisement, and particulars of the proposed improvement. The report of the surveyor (Mr. Philip C. Lockwood) says:—

"In pursuance of your instructions I beg to submit to you herewith a plan of the beach and foreshore from East-street to Black Rock, with reference to the improvements which have been suggested on the Madeira-road, and in so doing I wish to point out that, in addition to the proposed improvement between the Chain Pier and Paston-place, it is also very desirable that the base of the slope at Duke's Mound should be defended by a sea-wall extending from the groyne opposite Paston-place to the Kemp Town slopes, and that the lower roadway should be extended from the north end of the concrete groyne to the gap at Black Rock, as proposed by me in 1872, a plan of which I also present herewith."

The committee recommend that premiums be offered for designs for the erection of Public Tidal Baths for men and women, with suitable adjuncts and conveniences, embracing tepid swimming-baths and private baths, on the beach, off or near Atlingworth-street, and that the premiums be 200*l.* for the best design, 100*l.* for the second, and 50*l.* for the third. The committee also recommend that the form of advertisement and draft conditions for the competition, appended to their report, be approved of and adopted. The form of advertisement states that the Town Council desire to improve that part of the sea frontage called Madeira-road, extending from the Chain Pier to the concrete groyne opposite Paston-place, by the erection of public tidal baths, with terraces, sheltered seats, summer-houses, and other public conveniences, and invite architects and engineers to give designs for this purpose. The drawings and designs to which premiums are given are in each case to become the property of the Town Council, who will not be bound to employ any competitor in or about the execution of the work, or otherwise, nor to make any payment with regard to any of the designs, except the three premiums above mentioned. The designs are to be sent to the town clerk on or before the 1st day of February, 1883. Particulars, for the information of engineers and architects sending designs, are also appended, and from these it appears that the baths are to embrace a tepid swimming-bath with a water area of about 200 ft. by 50 ft. for men, and a swimming-bath, with about half that water area, for women; about fifty private baths for men and thirty for women, and suitable adjuncts and conveniences. Careful arrangements, the particulars continue, must be made for filling and emptying the baths, and for heating them without making smoke. Ample public conveniences for men and women, and spacious places for promenade and recreation, should be provided in connexion with the baths. It is not intended to make provision for shops or for the sale of goods, but only for the sale of newspapers, light literature, and refreshments; and there should be accommodation for attendants. It is also proposed to construct such other terraces, promenades, embankments, summer-houses, sheltered seats, grass slopes, or the like, as may be conducive to the improvement of the roadway as a place of public resort, and to the pleasure and comfort of visitors, and the designs are to show the best means of approach from the Marine Parade and other adjacent roadways to the site of the proposed improvements.

The report of the Committee was adopted.

EXTENSION OF THE BRITISH MUSEUM.

ON Saturday last the corner-stone of a block of buildings connected with the south-eastern side of the British Museum was laid by Mr. Edward A. Bond, Principal Librarian, in the presence of the chief officers of the Museum and others. Mr. Bond took advantage of the occasion to make it known that the new buildings, consisting of a frontage to Montague-street of 120 ft., with two sides carried up to the museum walls, were being erected from funds bequeathed by Mr. William White, a gentleman who had resided in the neighbourhood, and who, at his death, in the year 1823, left the reversion of a sum of 63,941*l.* to the trustees of the British Museum, to be used at their discretion, but with the expression of a hope that it would be expended on an extension of the Museum buildings. The actual terms used by the testator are as follow:—

"The money and property so bequeathed to the British Museum I wish to be employed in building or improving upon the said institution; and that round the frieze of some part of such building, or, if this money is otherwise employed, then over or upon that which has so employed it, the words 'Gulielmus White Arm. Britanniæ dicavit 18—' be carved, or words to that import. It is a little vanity of no harm, and may tempt others to follow my example, in thinking more of the nation and less of themselves."

The bequest fell in early in the year 1879. By payment of the legacy duty,—rigorously exacted by the Government,—it was reduced to 57,572*l.* Of this sum about 11,000*l.* has been expended in the erection of a new gallery for Greek sculptures, between the Elgin and Assyrian galleries, and in other works connected with it. The remainder is now being spent on the new block of buildings. It was further explained that this would give accommodation on the ground-floor for the rapidly-increasing collection of newspapers, which has outgrown the space

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designed for it in the library, together with a convenient reading-room in which they could be consulted, and, on the two upper floors of the front and north side, rooms for the department of prints and drawings, with space for exhibition.

The plans of the building have been furnished by Mr. John Taylor, surveyor to Her Majesty's Office of Works; and the contractors are Messrs. John Mowlem & Co. It is expected that it will be completed within about twelve months from the present time.

THE SANITARY CONDITION OF BERLIN.

The question of sanitary reform has long been a prominent one in technical and official circles in the capital of the German empire; but an opportunity has now presented itself of obtaining a ready insight into the progress really made in that city. This is afforded by Dr. Skrzeczka's report to the Imperial Government, from which it appears that much work of a really useful character has been done at Berlin of late. Party differences and occasional diversity of views between the state officials and the municipal authorities have been merged in the successful efforts to promote the health of the population.

The purity of the air has occupied attention, with special reference to the necessity for new building regulations, framed with a due regard to the exigencies of the public health. According to the estimate of Herr Böekh, the population of Berlin is more numerous, in proportion to the ground covered by the capital, than is the case in any European city. It is remarked by the *National Zeitung* that this evil has increased of late, and has had a direct influence upon the spread of epidemic diseases. The unfavourable situation of Berlin, together with the unsatisfactory condition of the dwelling accommodation in many parts of the city, exercise a combined effect upon the mortality amongst children in a special manner.

The efforts to find better sources than heretofore for the drinking-water of the population, and the due carrying out of the filtering arrangements, have been matters of special moment to the various administrations affected.

There seems to be a general opinion that the system of drainage introduced into Berlin of late years has exercised a beneficial effect upon the public health. The frequency of the occurrence of typhus fever is usually considered a reliable standard for estimating the sanitary condition of a city. The report of Dr. Skrzeczka points out that the result of the adoption of drainage in certain districts was a progressive improvement of the health of those portions of the capital and a gradually decreasing number of typhus cases.

THE GENIUS OF SIR CHRISTOPHER WREN.

Sir,—A letter appears in the *Builder* of September 23, signed "Andrew T. Taylor," commenting on some points in my recent paper on the genius of Sir Christopher Wren; but so void of argument and so uncourteous that, but for fear my silence might be misconstrued, I should leave it unnoticed.

In his haste to contradict me, the writer mistakes and misrepresents my meaning in the passage he refers to. The doubt I expressed in reference to Wren was whether he possessed, in strength of imagination, higher resources and inspiration than what geometry yielded him; not whether he had power to design independently of his geometrical resources, which no man has; and my object was to suggest that geometry is not the only fountain of architectural beauty,—that architectural designing is something higher than a geometrical operation, or the construction of regular solids,—and that, though based on geometry, architecture can soar into the pure haunts of imagination.

I now contend that though the great majority of architects do not conceive graceful architectural forms independently of, or beyond, their geometrical resources, the man who cannot do so is not, in the high and true sense of the word, an architect, imagination being the vital quality in all art-work.

I have only to add that Mr. Taylor's quotation from the late Mr. G. E. Street, R.A., whatever it may be to his own mind, is by no means conclusive to mine; and, as Mr. Street had no monopoly of critical judgment, I take the liberty, without the least feeling of disrespect to his memory, to differ from him on the subject; and whether the failure of the steeples in question has been acknowledged or not, to reassert it on my own responsibility. The very natural and touching remarks of Mr. Street in his address to the Institute are, however,—rightly read,—but little at variance with my position. Whether I am right or not can only be judged by those few who are capable of designing or imagining superior compositions of the class. To those few I appeal. Wren's steeples will doubtless be perfection to him who can see nothing higher and brighter beyond them.

Samuel Huggins.

PROPORTION IN PRACTICE.

Sir,—The series of papers which have lately appeared in your journal on the subject of proportion in architecture are specially valuable in the light of present-day practice. With the revival of the picturesque in architecture and the extent to which it has been developed, there is a tendency to value it exclusively for its own sake, and to ignore the just and fundamental claims of proportion. It is difficult to define what proportion is, and much injury has been done to the cause of good architecture by propounding theories which are purely mechanical in their basis. Excellence of proportion is the result of many qualities; it will commend itself to the intellectual and æsthetic faculties, and therefore be the product of both combined, and not of either separately, but the result of this combination must in turn be tested by experiment and practice. Hence an advantage in studying good models of the best styles of architecture, so that we may, if possible, ensure some advance on what has been already done. Much good work is being accomplished in this direction; old forms with their refinements are recombined and reproportioned, new creations of beauty are the result. But danger may arise from satiety; even good forms repeated are apt to pall on the mind; when that occurs, there is then a tendency to change their proportions with a view to new effects. This is sufficiently evident in much of modern practice, and, while regrettable, is in a certain measure excusable. The architect has a story to tell, and prefers to do so in his own way, and it may, though crude, lead perchance to fields and pastures new, and, provided it does not violate good taste, be accepted with thankfulness as a new rendering in art.

Modern practice is diffuse, and the cases are rare where a man devotes himself to one branch of architectural art, each succeeding effort surpassing that which went before. Even assuming such a case, it would require to be multiplied by many contemporaneous instances, as no one mind is capable of eliciting the whole truth; it must be the work of several, each sharing with each that aspect of it which commends itself to his own individuality. We can never again have that unity of architectural effort which characterised what men are pleased to call the Dark Ages.

It has been the theory of many people that geometrical proportion pervades the architecture of those times, and your esteemed correspondent, Mr. Cave Thomas, alludes to it in your issue of the 16th inst. [p. 383, *ante*]. But as this subject is an interesting one, and may be regarded from another standpoint, I venture to say that in the various qualifying circumstances with which actual practice is invested, the theory becomes of doubtful applicability. Take some normal architectural form, something possessing unity, and which may have been operated on by various minds during many generations, and therefore likely to embody the quality of good proportion in its fullest measure,—the Gothic cathedral, for instance.

Imagine, in the first place, each part of that edifice a gem of art, carefully related in height, width, and detail; this accomplished, take the next step of uniting these parts together, and you have, up to that stage, a merely mechanical combination. Something else is required to encompass it within a higher principle: it may be desired to impart the attributes of dignity, aspiration, or mystery, but all these elements are so far independent of good proportion that their evolution may require the modification of those proportionally-related parts.

Besides all this, the effect of a building is modified by the standpoint of a beholder, so that what might be satisfactory in one aspect may be quite otherwise from another. Foreshortening, with its transmutations, for instance, is a condition which must be taken into account. Or again, the whole effect of a building may be changed by the nature of its situation; and, be it peaceful valley or rugged hill, proportion will inevitably need adaptation to different surroundings.

Is Mr. Cave Thomas right in severing construction from art in its claims on proportion? May construction in satisfying the judgment not also gratify the æsthetic faculties? The flying buttress is essentially constructive, and, withal, one of the most beautiful conceptions of Gothic art. Even the factory chimney referred to has its latent capacity for development into good, if not graceful, proportion. Moreover, the material we have to deal with may further demonstrate this view of the case. If a column be of iron we adopt an entirely different ratio of diameter to height than in the instance of stone, and either of these two modes of construction will satisfy the taste and judgment of any person cognisant of their respective qualities.

If there be, therefore, any connexion between construction and art, it seems reasonable to expect that by satisfying the claims of the one the interests of the other are not neglected.

G. S. Aitken.

"WHAT IS PROPORTION?"

Sir,—Your correspondent, Mr. Cave Thomas, [p. 383, *ante*] in dealing with this subject, concludes very justly that "every quantitative relation, every proportion, good, bad, or indifferent, is mathematical, and every configuration of surface and every form of solidity is geometrical," and in consequence that constructive fitness need not of necessity be symmetrical. He apparently overlooks the difference between *aliquant* and *aliquot* proportion. During a practice of thirty years as an architect, I have given this subject considerable attention, and have found that well-proportioned rooms, for instance, are only to be obtained by the following rule of geometrical relation, which may be varied to any magnitude, taking the height as the standard of measurement:—

Height of room, 18 ft.	Length.		Width.
The cube	18 ft.	...	18 ft.
Cube and a half	27 ft.	...	18 ft.
The double cube.....	36 ft.	...	18 ft.
The subduple, 4, 3, and 2	36 ft.	...	27 ft.
Ditto, 5, 4, and 3 ...	30 ft.	...	24 ft.
Ditto, 6, 4, and 3 ...	36 ft.	...	24 ft.
Ditto, 3, 2, and 1 ...	54 ft.	...	36 ft.

All these relative proportions, and many others, varying with the standard height, produce what has been termed the harmonic proportions of rooms, and in practice, I have always found them satisfactory in construction. Writing on this subject more than a hundred years ago, an old writer says, "Nature has taught mankind, in music, certain rules for proportions of sounds, so architecture has its rules dependent on those proportions, or at least such proportions which are in arithmetical harmony; and those I take it to be dependent on nature. The square in geometry, the unison or circle in music, and the cube in building have all and inseparable proportion; the parts being equal and the sides and angles, &c., give the eye and ear an agreeable pleasure." The same natural law may be noted in the regularity of the progressive strain brought upon a lattice girder as represented by numerals, a regularity by which all the laws of creation are distinguished, and through which they have been interpreted by such men as Newton, Herschel, and Darwin.

The only means by which an accurate reproduction of the proportions of the old Classic temples of Greece and Rome can be obtained, is by quantitative relation. The diameter of the base, divided into modules and minutes, is the standard scale by which the depth and projection of the smallest member is regulated. Mr. Thomas may argue that the beauty which is the undoubted result of these proportions is the effect of custom, but if they had not been originally pleasing custom could never have established them at all.

Mr. Thomas dubs those who differ from him on this question as half-educated persons, but by these rules such buildings as the Parthenon are to be judged, and were applied before men

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were educated up to the standard of Mr. Thomas's conception, and before the word æsthetic, as used in the modern parlance of the day, brought art into contempt.

I may add that the width of the windows has always been considered by architects as regulating the height on every floor. A good proportion for a window on the second floor is obtained by squaring the width and taking the diagonal as the height.

BYNG GIRAUD.

FROM BIRMINGHAM.

THE lighting of the Birmingham Town-hall for the evening performances during the Musical Festival was entrusted to Messrs. Winfield & Co., of Cambridge-street, and they adopted the Swan incandescent lamps fitted to cluster pendants of their own manufacture, arranged around the hall so that each pilaster above the galleries had on the sides of the hall a cluster of twelve lights, and on the ends of the hall a double cluster of twenty-four lights each. Lamps were also arranged in pairs under the galleries, and chandeliers in the committee and artistes' rooms, and an arc light of a nominal 10,000 candle power suspended over the entrances in Paradise-street. These all gave great satisfaction. The whole of these fittings the Messrs. Winfield now offer to the Corporation as a present to the town. The electricity was derived from some twelve Crompton-Burgin dynamo-machines, set up in the works at Cambridge-street about a quarter of a mile away, and transmitted through wires laid down in pipes through the streets to the hall. The firm now offer to supply the electricity to light the hall when required at the rate of 8*l.* per six hours for inside the hall, and 2*l.* per six hours for the arc lamp outside the hall, provided the Corporation purchase from them the pipes and wires laid down in the streets. These terms are generally considered onerous and excessive, and are some 40 per cent. more than the present cost of gas.

Another meeting of the Dawson Memorial Committee has recently been held, and an announcement made which has given great satisfaction in the town. The committee find themselves no longer able to contend against the almost universal convictions of the subscribers and the public as to the utter want of artistic merit in the present statue; and as it has been recently discovered that the figure was suffering from a broken nose,—done by a workman during its erection,—a fact which, to the writer's knowledge, has been an open secret ever since, they recommend that a new statue be obtained, and the present one removed. As a considerable sum of money remained in their hands after paying all expenses of the present statue, the contractor and the committee have made it up to 800*l.*, a sum which Mr. Williamson is willing to execute a new statue for, and his offer is accepted. A very warm discussion is now going on as to the desirability of removing the very pointed Gothic canopy, and re-erecting that and the statue over the grave in the cemetery. The general feeling seems to be, that if the new statue is to be a standing figure, the canopy ought to be removed and the canopy cast in bronze; but if the canopy is to remain, then the figure may be of marble, but should be sitting. E. G.

ELECTRICITY AND VENTILATION OF BUILDINGS.

THE dynamo-electric machine has already been shown, in the able papers of Dr. Hopkinson, to be a most economic transformer of energy; in fact, there can be room for little improvement in a machine which, when used for heating or lighting, actually transforms nine-tenths of the power applied to it into actual work, exclusive of friction. By connecting the terminals of the dynamo-machine, to which power is applied, with those of a similar machine, a certain portion of the power can be re-obtained, independently of the distance between the machines. This power varies with machines of different construction. With the Siemens machine, which is particularly well adapted for the transmission of force to a distance, the best actual results seem to be 49 per cent. of returned energy. In ordinary cases the loss is too great for power to be transmitted in this matter, unless the original source is obtained for nothing, as in the cases of utilising a waterfall, or the rise and fall of the tide. Where the electric current is laid on for lighting purposes, as in a theatre or workroom, for instance, advantage may be taken of the application of the power by utilising it to work the apparatus for ventilation when not in use for lighting. The great drawback of mechanical ventilation hitherto has been the necessity of having a steam-engine. With the introduction of the electric current this will be got over, and wherever a building is lighted by electricity a means will be provided for thoroughly purifying and renewing the air when the light is not being used. More than this, it would be possible to utilise the surplus energy of the current supplying each arc lamp by causing it to work small electro-motors, placed either in the main or in the shunt circuit of the lamp; or, if several fans were to be worked, a special separate generator could be used. These motors would actuate small exhaust-fans fixed in the air-ways in the places hitherto found most difficult to ventilate.

The author has found by experiment that as long as the power thus taken off is practically constant, no irregularity is noticed on a light working on the same circuit. It is for this reason that it would be better to cause the fans to exhaust air rather than to supply under a pressure which might vary from time to time. Where a system of electric mains has been laid down, the introduction of power for the purpose of working every class of light machinery will become general.

Hoists can be worked, sewing machines, lathes, and looms have already been driven by small electro-motors, selling at the present time for about 30s. each and upwards, and which, from the absence of complicated working parts, will cost, for renewals and repairs, less than the oil consumed in the gas engine they are destined to supersede at an early date.

KILLINGWORTH HEDGES.

THE FALL OF A BUTTRESS AT ST. PATRICK'S CATHEDRAL, DUBLIN.*

THE inquest on the bodies of the three persons who lost their lives by this disaster was resumed on the 21st inst.

Mr. R. M. Carnegie, in answer to the Coroner, said,—I am verger in St. Patrick's Cathedral. I was standing in the choir with Dean West when the buttress fell. It was at a quarter to twelve in the forenoon.

To Mr. Collins (who appeared for the Dean of St. Patrick's and the Cathedral Board).—The pinnacle that fell was not one of those interfered with or renovated by the late Sir Benjamin Lee Guinness. On the back of this pillar, under the flying buttress, there were stones on which were cut the words, "Rebuilt by Henry Kingsmill, 1845." Before it fell it was never suggested to me that the buttress was in a dangerous condition, nor that any imperfection existed in it.

Mr. James F. Fuller, architect to the Board of St. Patrick's Cathedral, deposed, in reply to Mr. Collins, that he had been twenty-five or twenty-six years in the profession. He was architect for eight years under the late Ecclesiastical Commissioners, for a large district extending to nine counties. His duties as such architect were to superintend the erection of churches, of additions to churches, and the execution of repairs on churches. He was architect in the restoration of Limerick Cathedral, and was one of four architects to the Representative Church Body.

By the Coroner.—Was the work of excavation being done under your direct supervision?—As a matter of fact, I was absent when the excavation was made at the buttress that fell, but I do not think it would be fair, on a technical point of this kind, for me to shirk any responsibility.

Do you assume the responsibility of saying that, as far as you saw, the work was well done?—I did not see the excavation at all.

Well, it was done by your direction?—I saw the work after it had fallen.

Have you examined the place thoroughly since?—I was there about an hour after the accident, and have been there every day since. I have thoroughly examined the place.

Did you find the work done well?—Yes, I should say decidedly.

Was there any part of it that you thought unsatisfactory?—The only point I could find fault with was that my orders had been disobeyed.

In what respect?—In the use of mortar instead of cement in the underpinning.

What was the effect of being set in mortar?—The effect we usually apprehend is subsidence at the joints.

Was this effect manifest in the case?—I could not judge that, because of the shaken condition of the masonry which was standing.

If a subsidence had not taken place, would you anticipate the fall of the buttress?—I would not.

I suppose by subsidence you mean what is ordinarily called "settling"?—Yes. I may state that in underpinning we depend more upon the proper wedging up of the work than upon the mortar or cement.

Would you be able to form an opinion as to whether the stonework was well done?—It was.

Have you formed any opinion that would guide us, Mr. Fuller?

I maintain that this old buttress (pointing to a model), which was cased up in 1845, separated from the wall years ago; it may have been centuries ago.

Do you think the persons engaged at the work in 1845 could have seen that crack?—I think they could.

This rotten state of things was undiscovered, according to your evidence?—It was.

But something must have formed the climax; something must have immediately led to the fall. Can you give an opinion as to that?—It is almost impossible to answer that question.

This is the question upon which we ask your opinion?—Goggin himself stated in his evidence, I think, that it must have been caused by the excavation under the pier, but he stated also that in any case it would have fallen, and that is my opinion.

Is there any other thing you wish to express an opinion upon?—There is one point upon which I wish to express a clear and decided opinion. I have been asked out of court whether before the operations commenced at this buttress if, suppose I had been asked, would I have recommended it to be shored, and I wish distinctly to say that, taking into consideration the fact that the buttress was supposed to be bonded to the wall, and that the pressure for which the flying buttress was originally built had been removed, I certainly would not have directed it to be shored. If I had been asked by Mr. Pile whether there was any necessity for shoring it, I should decidedly have said not.

You spoke of Mr. Pile as the contractor?—Yes.

Had Mr. Pile any contract for carrying out any late works on the cathedral?—No, he was working on a schedule of prices, and was paid for what he actually did.

A Juror (Mr. Rafferty).—Had not he articles signed?—Yes, but he was working on a schedule of prices.

Mr. Law.—If he had been told to shore up this buttress would it not have paid him better?—Yes.

And, as a matter of fact, working with cement would have been more profitable to him than with mortar?—Yes, according to his schedule of prices.

And, therefore, he had no motive in using mortar?—According to the prices of the articles it would have paid him better to use cement.

Edward O'Reilly, 65, South Circular-road, examined by Mr. J. O. Byrne, said,—I am a builder and contractor. I know these buttresses for the past fortnight. I saw the one that fell while the works of excavation, &c., were going on.

Did you see anything the matter with the buttress that fell?—I did. About the 5th or the 6th of September, in passing down, I observed a sinking in the arch of the flying buttress to the extent of 1½ in. The same thing was visible in two other arches near it.

Mr. Byrne.—Did you point that out to anybody else? I pointed it out, first to Mr. Conway, a builder, and again to Mr. Brodigan, another experienced builder. I saw how the foundation of the buttress that fell had been excavated, and I thought, having regard to the sinking of the flying buttress, that before the excavations went far it should have been shored with heavy balk timber. I did not see any indication of danger at that time, but on the

* See p. 410, *ante*.

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day I brought Mr. Conway (about the 5th or 6th) I thought they were excavating without proper trussing or shoring.

The Coroner, having summed up, the jury retired, and after half an hour's absence the foreman announced that twelve were for holding Mr. Fuller and Mr. Pile responsible. The remaining juror was only for holding Mr. Fuller alone responsible.

The Coroner.—But you are agreed that it was an accident?

The Foreman.—Yes.

At the request of the jury the coroner then drew out the verdict in legal form.

The jury again retired to consider the terms of the verdict, and after a short absence the Foreman announced that they were unanimous in the following:—

"We find that Sarah Egan, John Ward, and James Bolger, were crushed to death at Patrick's Close, on the 14th of September, 1882, by the accidental fall of one of the stone buttresses of St. Patrick's Cathedral, and we consider that the accident was due to the culpable negligence of Mr. Pile, the builder, and Mr. Fuller, the architect, then engaged in works at the said cathedral."

THE INSPECTION OF FACTORIES AND WORKSHOPS.

THIS subject was discussed last week by the trade unionists assembled in congress in Manchester.

Mr. A. W. Bailey (Preston) moved:—

"That, whilst acknowledging the great and beneficial results to the factory and workshop population of the United Kingdom conferred upon them by the legislation of the past half century, this congress is of opinion that a vast amount of juvenile and female labour is still carried on under conditions entirely opposed to the intentions of the factory and workshop laws, and in a manner most detrimental to the physical and moral well-being of the workers engaged, and in many cases producing great danger to the public health. This congress is therefore of opinion that, in order to the better enforcement of these laws, the united trades should continue to urge upon the Government the great and pressing necessity which exists for such an increase of practical working men and women as sub-inspectors as would meet the constant extension of factory and workshop industries, and thus to enforce the observance of the law upon many who now evade it, to the disadvantage of those honourable employers who faithfully carry out the intentions of the Legislature."

He said he did not wish to speak in disparagement of the present inspectors, but it was impossible for them adequately to perform the work entrusted to them. Any one with a practical knowledge of the great increase not only of factories but of domestic workshops, would say it was simply a farce to think that fifty inspectors for the United Kingdom were sufficient. It was the duty of the Government to make such provision as would meet the requirements of any Act they might pass, and he believed that congress would be able to supply the Government with fifty or 100 practical men and women well qualified to act as sub-inspectors.

Miss Wilkinson, upholstress, London, seconded the motion. She said there was nothing so bad as to make a law and not carry it out, and to give men work as inspectors which they were unable to perform was not likely to create respect for the Act. She could not understand the argument against lady-inspectors. If a place was fit for a female to work in, it ought to be fit for a female to inspect.

Mr. M'Lean (Edinburgh) said that they had felt very strongly indeed on the subject of inspectors. It was not so much an increase in the number that was wanted as a change of the class of men. The present inspectors had no sympathy with them because they did not belong to the same class. He thought the congress did well in asking for an additional number of inspectors at a low salary. Had they asked for an additional number of men to be appointed at large salaries, it would have looked as if they were trying to hoist some of their best men into good positions. Their intention, however, was not to get big salaries, but to see that the law was efficiently carried out, in order that their lives, those of their families, and the general public might be protected.

Mr. Bloor (Burslem) said he thought the resolution did not entirely cover the question. There were different degrees of danger among different employments, and what was wanted in connexion with this movement was a thorough searching inquiry, by a commission or Parliamentary committee, in large centres of industry where females and children were employed, to see how far their labour in certain departments was injurious to health.

Mr. Simmons (Maidstone) said the administration of the Act had done a great deal of good towards purifying the brickfields of both juvenile and female labour. It was impossible, however, that inspectors could get through their districts more than twice or thrice in the course of a year. Unless the attention of the inspectors was called to special cases of infraction of the law, they knew that several districts went uninspected for several months in the year. He considered that there was the greatest necessity for additional inspectors.

Mr. Drummond (Glasgow) moved, as an amendment, "That the proposal to appoint women as sub-inspectors should be struck out of the resolution." He did not question the ability of the ladies, but he thought it would be better to get half a loaf rather than none. If they sent their representatives to the House of Commons with their case, before women's rights had been acknowledged in that House, they would get nothing like the increase of inspectors that they wished.

The amendment was not seconded, and the resolution was put and carried unanimously.

THE SANITARY CONDITION OF BAKEHOUSES.

AT the Trade Unions Congress, held in Manchester last week, a resolution was submitted by Mr. Jenkins, of Manchester, instructing the Parliamentary Committee to use their influence with the Government to promote a measure as early as possible to prevent bakehouses being constructed underground, and to insure that bakehouses should be inspected the same as factories, workshops, and mines. He stated that many of the bakehouses were in such a disgraceful condition that they were not fit for the purpose of preparing food, and he called the attention of the delegates to a recent report of a Government official on the state of the London bakehouses if they wished to know what it was that required to be done. The contrast between the inspections of corporations and Government was of the most astounding character, and it was absolutely necessary, if any improvement was to be made, that they should demand more efficient and more regular inspection.

Several delegates suggested that the improvement was a matter rather for corporations than for the Government, and that regulations should be insisted upon when the bakehouses were being built, which would remedy all objection to the charge of their unsanitary state.

Some delegates gave examples of the filthy state of bakehouses, and also the habits of the workmen, and said there were scores of bakehouses in all large towns which, if only the public could see them, they would at once move in this matter in such a determined way that a change would soon be brought about.

Mr. McLean, of Edinburgh, moved an amendment, extending the proposal of the resolution to all trades carried on underground, which Mr. Stevens, Glasgow, seconded.

The resolution was carried.

At the Marylebone Police Court on Saturday last Alfred Alford, baker, Willow-walk, Fortess-road, Kentish Town, was summoned by Mr. James B. Lakeman, Inspector of Factories, for, on the 7th and 8th inst., neglecting to keep his bakehouse in a clean state. There was a further summons for neglecting to affix on his premises the prescribed abstract of the Act 41 Vict., c. 11.

Mr. Lakeman said that the responsibility on the owner of a bakehouse was now much greater under the Act than formerly. The defendant had on his premises two bakehouses, one below the other, and on the days mentioned the lower one was found to be very dirty, and was not thoroughly ventilated. At the foot of the stairs, covered over with sacking and loose boards, was a well about 3 ft. long and 2 ft. wide, and filled with water 7 in. in depth, and at the bottom there was a deposit of matter. The liquid had overflowed the floor of the bakehouse, and stood above 1 in. deep about the ovens.

Alfred Blake, the principal baker in the defendant's employ, said the water in the wall was rainwater which had come from adjoining premises. It sometimes overflowed the floor of the bakehouse, and they got "rid" of it by pushing a cane into the sewer, or dipping it out. The kneading-trough was about 2½ ft. from the well.

Captain Armstrong, one of the Factory Inspectors, stated that on the 8th he visited the place with Mr. Lakeman. A portion of the soil was taken out of the well, and it consisted of black mud and stones. Effluvia arose from it, and it had sewage matter mixed with it.

The magistrate, in the hope that the case would be a warning to other master-bakers, imposed a penalty of 20s. in the first summons, with the costs, and the defendant must pay the costs in the other summons; the well must also be removed and the place limewashed.

DRAINAGE IN FRANKFORT.

SIR,—At p. 388 of the *Builder* of September 23rd, 1882, is a description of the new main sewerage and house-drainage systems carried out by the Messrs. Lindley at Frankfort. The writer does not seem to be aware that the system is, with some exceptions, essentially the "English system," as advocated and taught by myself. The resident engineer, from the first to the completion of the main sewers, was Mr. Joseph Gordon, who went from my works at West Ham, to Frankfort, under Mr. Lindley, and I have been in constant communication with the Messrs. Lindley throughout the whole of their works. I do not desire in any degree to disparage the Messrs. Lindley; I only wish to claim an English origin for the works. Mr. Lindley, sen., had, it is true, sewered Hamburg before any work was commenced at Frankfort, but I think he will admit that he very much perfected his Frankfort works through Mr. Gordon, and by a study of what was being done in England. At this moment I, however, know of no better works of main sewering and house-draining than the works of the Messrs. Lindley at Frankfort, either in England or abroad.

ROBERT RAWLINSON, C.B.

*** Too late for insertion, we have received several long letters on the same subject, notably one from Mr. James Mansergh, complaining of the omission of Mr. Gordon's name in the article referred to, and one from Mr. Gordon himself, giving a history of the undertaking. The latter we will print next week.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

4,402. S. S. Hellyer, London. Supply and waste valve for baths and lavatories, &c. Sept. 15, 1882.

4,423. W. R. Lake, London. Composition for the preservation of wood, stone, &c. (Com. by A. Bugolich and T. K. Smith, Victoria.) Sept. 16, 1882.

4,430. J. Imray, London. Water-closets, &c. (Com. by R. H. Lecky and J. Hay, Pittsburgh, U.S.A.) Sept. 18, 1882.

4,437. L. C. C. Currie, London. Fastenings for blind-cords or wires. Sept. 19, 1882.

4,438. J. W. Andrews, Whittlesea. Blind-roller furniture. Sept. 19, 1882.

4,449. W. G. Stevens, Bristol. Combined range and register-grates. Sept. 19, 1882.

4,462. J. McPhail, London. Chimney-tops, &c. Sept. 19, 1882.

4,466. E. Edwards, London. Apparatus for closing, &c., window-frames. (Com. by A. Descaves and D. Halut, Paris.) Sept. 19, 1882.

4,479. W. McNicol, Leith. Appliances for securing windows, &c. Sept. 20, 1882.

4,491. W. H. Cooper, London. Drip-course bricks for weathering to brick wall, &c. Sept. 20, 1882.

4,495. W. R. Lake, London. Manufacture of bricks. (Com. by. H. R. Dickinson, Hamilton, U.S.A.) Sept. 20, 1882.

4,509. T. H. Noote, London. Drain-pipes. Sept. 21, 1882.

4,514. J. W. Cook, London. Forming temporary partitions in class-rooms, &c. Sept. 21, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named:—

September 19, 1882.

2,275. T. Welton, London. Bedsteads, couches, and chairs, &c. May 15, 1882.

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street.

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2,498. A. M. Clark, London. Door-fasteners. (Com. by C. A. Crougeyer, Detroit, U.S.A., and G. W. Busch, Walkerville, Canada.) May 25, 1882.

September 22, 1882.

2,346. G. H. Haywood, London. Overmantels for chimney-pieces. May 18, 1882.

2,377. H. Kelly, London. Gullies. May 20, 1882.

2,556. G. L. Reynolds, Oakland, U.S.A. Window-screens. May 30, 1882.

ABRIDGMENTS OF SPECIFICATIONS.

Published during the Week ending Sept. 23, 1882.

445. J. Jaffrey, Manchester. Domestic fire-grates and stoves. Jan. 28, 1882. Price 6d.

The bottom and sides of the grate are of solid fire-clay, &c. The smoke, &c., passes through an opening in the back down to a chamber below the bottom of the grate, where it is met by heated air and consumed.

505. J. D. Brunton, London. Apparatus for dressing, turning, and moulding stone, &c. (Partly com. by F. H. J. Frier, Boston, U.S.A.) Feb. 1, 1882. Price 10d.

The circular rotating cutters are placed at such an angle to the stone that they shave or pare it away, instead of splitting or abrading the surface.

715. R. M. Chevalier, London. Venetian blinds. Feb. 14, 1882. Price 6d.

These are made of very thin wood, which, when newly cut, are saturated with glutinous matter, comprised of glue and shellac, dissolved in highly-rectified spirit, to make them tough and pliable. The latter are slung in the usual way, but when drawn up are wound round a roller.

755. R. Weaver, London. Sanitary appliances. Feb. 16, 1882. Price 6d.

The trap and bend of the closet discharge-pipe are so formed that there is always some water retained in the bottom of the pan. The same kind of trap, &c., can be applied to gullies. The pan is ventilated by a pipe rising therefrom before the seat to the roof.

769. T. A. Weston, Stamford, U.S.A. Attaching door-knobs to spindles. (Com. by B. H. Lockwood, Stamford, U.S.A.) Feb. 17, 1882. Price 2d.

The knob-shank has a longitudinal slot extending from the spindle-socket radially through the wall of the shank, and also a transverse slot intersecting the longitudinal slot. A sleeve fits over the shank, and is made slightly eccentric. When the knob is put on the spindle the sleeve is turned, and the shank is gripped tight on the spindle. (*Pro. Pro.*)

770. E. Latham, Birkenhead. Bolt fastenings for doors and windows. Feb. 17, 1882. Price 2d.

Two bolts are attached, one at each end of a lever, which has a central sliding fulcrum. When the fulcrum pin is pressed forward the bolts of the lever enter the recesses in the sash. (*Pro. Pro.*)

781. A. Ashwell, London. Indicating door-fastenings. Feb. 17, 1882. Price 6d.

On the sliding bolt that secures the door on the inside are teeth which gear into a pinion, on the spindle of which, on the outside of the door, is a disc with the word "engaged" on it. This is enclosed in a case, with an opening so arranged that when the door is closed and bolted this word shows.

810. A. S. & C. Buxton & F. O. Ross, London. Ventilating-valve for preventing the bursting of water-pipes during frost. Feb. 20, 1882. Price 6d.

The outlet-pipe of the cistern is fitted with a valve. Beneath this valve a small air-pipe enters the outlet-pipe. The valve can therefore be closed and the water entirely drawn out of the outlet or service pipe without wasting all the water in the cistern.

THE SANITARY EXHIBITION AT NEWCASTLE-ON-TYNE.

IN connexion with the Sanitary Institute's Congress at Newcastle, elsewhere mentioned, an exhibition of sanitary appliances has been opened on the premises of the Tyne Brewery in Bath-lane. There are five classes of exhibits in all. The classes are divided into sections varying in number from six to eleven each. The work of erecting the temporary buildings and of joining them to the main portion and far north end of the brewery has occupied some time, but under the superintendence of Mr. Foggin, the contractor, it was all satisfactorily completed a week before the exhibition opened. The task of arranging the space was supervised by Mr. E. L. Box, the curator of the Sanitary Institute.

Class I. consists of constructive materials, paints, and other protective substances, wall-papers, decorative materials, machinery adapted for sanitary purposes, and washing-machines. The firms exhibiting include Messrs. W. E. Rendle & Co., London; W. B. Wilkinson & Co., John Ismay & Sons, the Sanitary Paint Company, London; the Art Tile Company, London; J. E. H. Andrews & Co., Stockport; Thos. Bradford & Co., Salford; Maurice Gandy, London; Manlove, Alliott, Fryer, & Co., Nottingham; the Turner Gas Co. (Limited), St. Alban's; J. & H. Harrison, Kirsop & Co., and Jas. Mitchell, Newcastle. Messrs. Bambridge & Ormston, Gateshead, exhibit a pair of wrought-iron entrance-gates which gained a prize at the Paris Exhibition last year. The gates are decorated in black and gold. The Whitburn Coal Company have erected a pair of gate pillars with limestone from Marsden. The little structure is ingeniously built of channelling, caps, kerb-stones, and paving blocks. A little further down in the same avenue, Mr. White, of the Great Western Works, Abergavenny, has on view the "Hygeian rock-building composition." A brick structure is here provided, and the strength afforded by the composition is shown by a number of heavy weights suspended from a girder of brickwork, which they fail to break down. An interesting feature to many will be the display of artistic wall and ceiling papers made in this department by Wm. Woollams & Co., of London. The Albissima Paint Company have at the head of the first avenue a cabinet containing samples and show-cards.

Class II. includes sewerage and water-supply fittings, water-closets, dry closets, urinals, sewage treatment, traps, sinks, baths, and lavatories, cisterns, &c. The exhibitors include Messrs. Wm. P. Buchan, Glasgow; Doulton & Co., Lambeth; Harriman & Co., Blaydon; John Fell & Co., Wolverhampton and Newcastle; Hayward, Tyler, & Co., London; Mather & Armstrong; Tylor & Sons, London; H. Watson & Sons; British Sanitary Company, Glasgow; A. T. Angell, London; J. & M. Craig, Kilmarnock; Hugh Stowell Cregeen, Bromley; Dinning & Cook; Rimington Bros. & Co.; Thomasson & Key, Worcester; John Mill & Sons; Wm. White, London; Maguire & Son, Dublin; Straker & Love; and R. Thubron. Messrs. John Fell & Co., Wolverhampton and Newcastle, are the largest exhibitors in this class. Their stand is a most extensive one, and is filled with baths, water-fountains, lavatories, pumps, and chandeliers. Henry Watson & Son show flush-tanks and waste-preventers, by Adams, of York; the "Westminster" steam-pump for raising water, leather hose, with copper standpipe and hydrant, and other articles, many of brass. John Mills & Son exhibit Winn's patent acme syphon cistern for lavatories, &c. Dinning & Cooke show improved stable-fittings for stall and loose box, with ventilating-panel door. Maguire & Son, Dublin, exhibit a couple of Dr. Scott's hot-air disinfecting houses. The interior is provided with baskets for the disinfection of clothing, and, by a very ingenious arrangement, any temperature can be obtained. A structure at this part is formed by the fire-clay bricks made by Messrs. Staker & Love.

Class III. comprises heating apparatus, cooking apparatus, smoke-preventing appliances, lighting, including electric lighting and ventilation. Messrs. Dunning & Co., Percy Works, Newcastle, have secured one of the best stands, and show cast-iron chambers and over-mantels. They have also exhibited a stove, "The Nautilus," in the form of a shell. The mouth of the latter forms the front of the fire, and the products of combustion pass up into the centre or axis, whence, with a spinning motion, they fly out on each side into vertical flues. A warming and ventilating stove from Dresden, intended for churches, schools, and public halls, is exhibited in this class. W. S. Forrest, Grey-street, Newcastle, exhibits the albo-carbon light in all its varieties. The most extensive article in this department of the exhibition is a single-acting Norton ventilating apparatus, worked by a two-horse gas-engine. It is the invention of Captain Norton, of the United States Navy, and consists of two cylinders, each 5 ft. in diameter. It has already been adopted on board the steamer *Salisbury*, built at Sunderland in 1872; on board the *Warwick*, built by Messrs. Wigham Richardson & Co.; in the Chamber of Deputies at Berlin; in one or two of the London hospitals; and at other places. It is claimed for the ventilator that it exhausts 240,000 ft. of air in an hour.

Class IV. is devoted to personal hygiene, foods, and disinfectants; and *Class V.* to miscellaneous exhibits.

The Exhibition will remain open until the 21st of October.

Sydney Exhibition Building destroyed by Fire.—A telegram from Sydney says that the Exhibition Building was totally destroyed by fire on the morning of the 22nd inst. The loss is estimated at 500,000*l.*

APPRENTICESHIPS AND OVERTIME.

AT the Trade Unions Congress, last week, Mr. J. S. Murchie, Manchester, moved the following resolution:—

"That, in the opinion of this congress, the system of working overtime is injurious to the health of the workers, and detrimental to the general welfare of labour; and that it is the duty of every trade unionist to endeavour to minimise the practice by enforcing such extra rates of payment as would prevent systematic overtime. It is also a matter deeply to be regretted that a growing tendency exists among employers in many trades to discourage the employment of indentured apprentices, thereby deteriorating the quality of skilled labour and inflicting serious damage upon our industrial progress."

He said the resolution differed very materially from most motions which had been submitted to the congress during the week, because they did not ask either the Parliamentary Committee or Parliament itself to do anything for them. The resolution pointed out something which they ought to do for themselves. His object in bringing forward the proposition was to get from the meeting some expression of opinion.

Mr. Sedgwick (Leicester) seconded the resolution.

Mr. Drummond (Glasgow) said he thought it to the interests of apprentices in some cases not to be indentured. The remedy was to make the pay for overtime double.

Mr. Evans (Manchester) in following, said that the overtime system as adopted in Manchester had broken down the benefit of the nine-hours system.

Mr. Buckley (Sheffield) said if we were to maintain our prestige as a manufacturing country we should look well into and consider the matter, and

Mr. Jack (Glasgow) said he was of opinion that the subject should be taken back by the delegates to their own districts, there to deal with it.

Mr. Anderson (Manchester) said that it should be the object of every trade unionist in the room to abolish this most abominable system.

Mr. J. Burnett (London) proposed, as an amendment, that the words "trade unionist" in the resolution should be altered into "trade union," and that, instead of minimising the practice as suggested, the following words should be made to follow on after "union," "to endeavour by special restriction or absolute resistance to abolish the practice."

Mr. Mark (Oldham) seconded this amendment, and, upon a vote being taken,

Mr. Burnett's proposition was carried by fifty-six votes against twenty-five given for the original motion.

BREACHES OF BUILDING BY-LAWS AT FINCHLEY.

A QUESTION OF OWNERSHIP.

AT the Highgate Police-court on Monday last, Messrs. Henry Goodwin & Walter Graham, architects and surveyors, of Air-street, Piccadilly, were charged on nine summonses, before Mr. G. Plucknett and Mr. G. N. Minto, as owners of ten houses in Manor Park-road, Finchley, with various breaches of the by-laws of the Finchley Local Board of Health, in connexion with the construction of the said houses.

The case was a peculiar one on the question of ownership, which was the point at issue, and had been adjourned for a month for the production of further evidence on the point, it not being admitted or denied that the defects existed. Considerable trouble had been caused to the Local Board by this property, the original builder of which, a man named Butcher, was summoned at this court some time ago for breaches of the Board's by-laws. Fines amounting to about 36*l.* were then inflicted, but Butcher disappeared without paying the money. It was asserted on the part of the Board that Messrs. Goodwin & Graham, who had been acting as architects, and "financing" the builders, then became owners; but Mr. Graham at the last examination denied on oath that he or his firm were "owners," and gave the name of Mr. Ashwyn, a solicitor, of the Temple, as the representative of the mortgagees, who, he contended, were the owners.

Mr. Ashwyn was now called by the Board, and gave a history of the "financing" of the estate, on which some 2,000*l.* or 3,000*l.* had been advanced by his clients, himself, and Mr. Graham respectively, their claims standing in the order given. Mr. Graham, he said, was "the owner," and would

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receive the rents of the property if any were coming in.

The Bench held Messrs. Goodwin & Graham to be the owners, and imposed fines and costs amounting to 29*l.* 8s. upon them.

THE "HYGEIAN-ROCK" BUILDING COMPOSITION.

SIR,—We note an article in your issue of the 9th inst. [p. 350, *ante*] on "Cement, Vulcan, and Asphalte Floors," in which it is mentioned that great difficulty is experienced in finding a material wherewith to construct tanks for the reception of acids. Our "Hygeian-Rock" building composition has been most successfully used by several firms in the Midlands for this purpose, and has been tested and conclusively proved to be acid-proof.

ARTHUR CHARGE.

SYNAGOGUES.

SIR,—Can any of your readers tell me if there is any Jewish synagogue in Europe having a spire to it? I believe there is one at Poonah, in the Bombay Presidency, but want a European precedent. Also, if such exists, where could I obtain a photograph of it? AN OLD CALCUTTA SUBSCRIBER.

CHURCH-BUILDING NEWS.

Newton Heath.—The new Church of St. Anne, Newton Heath, is approaching completion, and will shortly be consecrated. It will consist of nave, north and south aisles, chancel, organ-chamber, and clergy and choir vestries, the cost of erection being between 4,000*l.* and 5,000*l.* The foundation-stone was laid on October 1st, 1881, by Mrs. Fraser, wife of the Bishop of Manchester, the church being intended to serve that part of All Saints' parish lying nearest to Manchester, and which has for some years been known as St. Anne's district. Sitting accommodation is provided for 600 worshippers. Mr. A. W. Smith, of Manchester, is the architect.

Lindley (near Huddersfield).—The Parish Church of St. Stephen was re-opened for public worship on Sunday, the 3rd inst. The whole of the old pews in the nave and west gallery have been taken out; new floors, seating in best pitch-pine, and new gallery-front have been subsituted. A new porch leading to the western tower has also been added. The cost of the whole has been about 600*l.* All the woodwork has been executed by Messrs. T. Taylor & Son, of Salem-street, Bradford, with local men for the other branches. Mr. James N. Crofts, of Liverpool, was the architect.

Miscellanea.

Exhibition at the Manchester School of Art.—An exhibition has just been opened at the Manchester School of Art, consisting of works from the whole of the schools of the United Kingdom to which prizes have been awarded by the Science and Art Department, South Kensington. The works exhibited cover all the twenty-three stages indicated in the Science and Art Directory, and the collection includes drawings and paintings of the human figure, ornaments from the cast, and original designs, as well as studies of examples, from various museums, and the South Kensington Museum in particular. It is, we are informed, the first exhibition of the kind which has been held in Manchester for the last eighteen years. Entrance to the exhibition is free, and there have been crowded attendances.

Telephonic Appliances during Storms.—The *Deutsche Bauzeitung* gives publicity to an official report, according to which the telephonic connexions (which in Berlin are carried over the roofs upon iron standards) did not suffer any damage during the violent storm which swept over the German capital on the 15th day of August. Although the lightning struck many projecting portions of numerous roofs, such as chimneys, flagstaffs, sandstone figures, &c., the telephonic appliances escaped, notwithstanding the fact that these were, in some instances, quite close to places where the lightning struck. The total length of the wires which have been placed in position in Berlin is about 1,450 miles, and the number of iron standards is 2,450.

Proposed Street Improvements South of Fleet-street.—At the last meeting of the Court of Common Council, Mr. Wheeler (chairman of the City Lands Committee) presented a report with reference to the vacant land on the Thames Embankment. The committee proposed:—1. That the Corporation should give up to the Commissioners of Sewers, for the purpose of throwing into the public street, a piece of land on the south side of Temple-street and Tudor-street, containing about 10,283 superficial feet; 2. That a wedge-shaped piece of land on the north side of Tudor-street, and containing about 1,225 superficial feet, be appropriated by the Corporation when the leases of the premises abutting upon it expire, or the houses are rebuilt; 3. That the line of frontage next Whitefriars-street be set back by the Corporation; 4. That the valve-house on the south side of Tudor-street, belonging to the Gas Light and Coke Company, be set back to the proposed line of street at the expense of the Corporation; 5. That the Commissioners of Sewers continue the widening of Tudor-street by setting back the house between the land belonging to the Corporation and Water-street, the Corporation contributing to the expense thereof the sum of 1,000*l.*; 6. That the Commissioners of Sewers widen the approach to Bouverie-street by taking down the house at the corner of Fleet-street and the north-west end of Bouverie-street, and throwing the same into the public way. With regard to the valve-house, the architect (after conferring with the Secretary to the Gas Light and Coke Company) has estimated the expense of setting back at between 4,500*l.* and 5,000*l.* The Commissioners estimate the cost of effecting the improvement in Bouverie-street and setting back the property in Tudor-street, next to Water-street, at about 13,000*l.* In moving the adoption of the report, Mr. Wheeler said he believed the Corporation would be more than recouped for the piece of vacant land they would give up to make Temple-street 40 ft. wide. They would open new and important lines of thoroughfare from Fleet-street on to the Thames Embankment, and would relieve the overgorged traffic of Fleet-street. The report was adopted by 55 votes to 12, but notice of motion to rescind the resolution arrived at was given.

A New Curtain for Theatres.—Subsequently to the burning of the Ringtheater at Vienna, inventive genius has been greatly stimulated in exerting itself to provide for the safety of a theatre-going public. The iron curtain is a most important and valuable arrangement, but it is somewhat cumbersome, and, above all, expensive, and thus only suitable for large theatres. Its unwieldiness has led to the design of an apparatus which may, in some instances, replace it. The new curtain, which we briefly describe, is formed of a double layer of canvas, between which a large meshed net of stout cord is placed and quilted to the canvas. If at the moment of danger water is made to flow from a pipe which carries the curtain, the latter, as experiments have shown, remains intact, even if exposed to the greatest heat. One of the principal features of the invention is that, by the weight of the water pouring in, the curtain descends automatically, and thus by simply opening the watercock its descent and incombustibility are ensured, and further danger is at once prevented. The expense for such a curtain, moreover, is, as against an iron curtain, comparatively low, and small theatres are thus enabled to provide an efficient protection against fire.—*Iron.*

"Plans and Planning" is the title of the public opening lecture of Professor Roger Smith's courses of Architecture, Construction, and Professional Practice, at University College, London. The lecture, to which admission is free and without tickets, will take place on Wednesday evening next, the 4th of October, at six p.m. It will be fully illustrated. The regular work of the classes, as may have been learned from our advertising columns, begins the following week.

Leakage of Gas-pipes.—As much attention is now being devoted to the generation of diseases caused by the leakage of gases from the sewers, and which has, to some extent, threatened the character of Brighton, it is interesting to know that the South Metropolitan Gas Company have just had the ground opened in several places to see if any leakages arose from the joints of the pipes laid in 1879, and they have found them perfectly tight. The material used for this purpose was Spence's metal.

The Proposed Tower Bridge.—At the last meeting of the St. George's East Vestry, the chairman (Mr. Collyer) asked Mr. Fairclough, of the Metropolitan Board of Works, if he could give the Vestry any information as to the intentions of the Metropolitan Board in reference to the provision of a bridge across the Thames below London Bridge. Mr. Fairclough said he was not in a position to state anything definitely. The engineer to the Metropolitan Board had reported on the subject, and had foreshadowed three alternative schemes, viz., for a subway, a high-level, and a low-level bridge. The report was to be printed, and no doubt it would be presented at the next meeting of the Board, and then be put before the public. In view of the circumstance that it was not yet public, he (Mr. Fairclough) thought it would be hardly correct for him to make any further statement regarding it. He might say, however, that the members of the Board seemed anxious to do something, and as the negotiations with the Corporation had fallen through, the Metropolitan Board would have to act independently. Mr. Willey wished to know if any site had been suggested for the bridge. Mr. Fairclough replied that the site suggested was at the Tower. Mr. Willey said that in his opinion a crossing from the Minories would be far too near London Bridge, and do very little good for the East of London. As there was to be a fishmarket at Shadwell, a communication lower down than the Minories would help that and the East of London at once. Mr. Fairclough replied that, speaking with considerable knowledge of the traffic, he was convinced that at the Minories would be the best point for the bridge, as that would be easy of access, and would relieve the enormous traffic over London Bridge.

The Crystal Palace Electrical and Gas Exhibition.—This exhibition will be opened on the 24th of October, and active preparations for the display have commenced. Electricians will be largely represented, although they will be mostly those who did not appear on a former occasion. A few, however, of those who did well in the last display repeat their show in new form, and amongst these are the British Electric Light Company, who will illuminate the Egyptian Court; the Pilsen-Joel and General Electric Light Company, who will light up the Renaissance and Byzantine Courts and the orchestra; Messrs. Girard will take a part of the great transept; and Messrs. Strode a portion of the northern nave. Amongst those who were not in the last exhibition, the most important is Mr. Werdermann, to whom the Alhambra Court has been assigned. The advocates of gas will not be less powerfully in force. The gas interests are taken in charge by a general committee, under the chairmanship of Mr. George Livesey, whose repute as a gas engineer is well merited, and the gas-lighting of the south nave will be undertaken by them, under a plan which will secure the due representation of the various systems of gas-burners. There will be also an important display of gas-stoves.

Theatres.—At the meeting of the Metropolitan Board on this, Friday, the 29th, will be considered a letter from the Lord Chamberlain, forwarding a list of the theatres (twenty-seven) in his jurisdiction, the managers of which have applied for a renewal of their annual licence from the 29th instant, and requesting to be favoured with the opinion of the Board, whether, with reference to the structure of the theatres in question, and the safety of the public, his licence should be issued for them.

TENDERS

For alterations at the Greyhound, Fulham-road, for Mr. R. Dean. Mr. H. I. Newton, architect, 27, Great George-street:—

Bendon	£390	0	0
Forman	207	0	0
Godden (accepted)	197	0	0
Pewterer's Work.			
Warne	£53	0	0
Heath	47	15	0
Hellings (accepted)	40	0	0

For alterations at the Castle Hotel, Child's Hill, Finchley, for Mrs. Randle. Mr. H. I. Newton, architect:—

Godden	£575	0	0
Lamble	477	0	0
Pickersgill	454	0	0
Cook	431	0	0
Auley	420	0	0
Robey (accepted)	375	0	0
Pewterer's Work.			
Burrow	£78	13	0
Hellings	69	0	0
Heath (accepted)	69	0	0

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For building the new Church of St. Anne, Bagshot. Mr. H. A. Cheers (late Bromilow & Cheers), of West Kirby, Liverpool, architect:—

Mitchell Bros., Shalford	£5,650	0	0
G. Bullen, Bagshot	5,396	0	0
W. A. Goss	5,395	0	0
John Tyerman	5,378	0	0
Paramor & Son	5,284	0	0
Reavell, Staines	5,147	0	0
Jones & Co.	4,897	0	0
R. B. Barnes	4,840	0	0
James Harris, Woking	4,680	0	0
Martin & Wells, Aldershot	4,530	0	0
S. Woods, Weybridge	4,302	0	0
J. Higgs	4,039	0	0
J. E. Clarke, Poole (accepted)	3,996	0	0

For new church, St. Peter's, Fulham. Messrs. Mewman & Billing, architects. Quantities by Messrs. Lee & Son:—

Higgs & Hill	£7,104	0	0
J. & J. Greenwood	6,940	0	0
Goddard & Son	6,920	0	0
Colls & Son	6,645	0	0
Perry & Co.	6,630	0	0
Downs	6,467	0	0
Macey	6,406	0	0
Dove Bros.	6,385	0	0
Gibbs & Flew, Limited (accepted)	6,177	0	0
W. F. Croaker	6,047	0	0

For alterations and additions to two shops, Nos. 191 and 193, High-street, Hounslow. Mr. J. E. Palmer, architect:—

Geo. Reavell, Staines (accepted)	£350	0	0

For the erection of a shop and ware-rooms in the High-street, Ealing, for Mr. E. M. Hope. Mr. Geo. Ashby Lean, architect, Helena-chambers, Ealing:—

Myring	£550	0	0
Penny & Durrant	535	0	0
Adamson & Son	505	0	0
Waters	492	10	0
Nye (accepted)	450	0	0

For new infirmary, Chelmsford. Messrs. Fred. Chancellor and Chas. Pertwee, joint architects:—

Jos. Smith, Witham	£4,421	0	0
J. Grimes, Colchester	4,400	0	0
J. Brown, Braintree	4,200	0	0
H. Gozzett, Woodham Walter	4,040	0	0
W. Wood, Chelmsford	3,916	0	0
Choat & Saltmarsh, Chelmsford*	3,484	0	0

* Accepted.

For the erection of a public hall, club, and shop premises at the corner of St. John's-road and Lavender-hill, Battersea, for the Battersea and Wandsworth Public Hall Company (Limited):—

Rider & Sons	£12,430	0	0
Brass	11,979	0	0
Purnell & Sons	10,508	0	0
G. Shaw	10,295	0	0
Lathey Bros.	10,130	0	0
Appleton	9,990	0	0
Smith	9,871	0	0
James Holloway	9,560	0	0

For building residence and stables on the Bannisters' Park Estate, Southampton, for Mr. A. J. Day. Mr. J. O. Parmenter, architect. Quantities supplied:—
John Crook, Southampton (accepted).

For parochial room for St. Matthew's Church, Lavender-hill, S.W. Mr. W. White, architect, 30A, Wimpole-street. Quantities not supplied:—

T. Gregory, Clapham Junction	£697	0	0
Macey, Battersea Park	598	0	0
Pye, Williams, & Co., Lavender-hill	557	0	0
Burch & Moore, Lavender-hill	553	0	0
J. Holloway, Lavender-hill	545	0	0
E. H. Maplesden, Battersea-rise	540	0	0
Holloway Bros., Shaftesbury Park	528	0	0
Ellis, Lavender-hill (accepted)	458	0	0

For the erection of new Baptist Chapel at Beckenham, Kent. Messrs. H. D. Appleton & E. W. Mountford, architects. Quantities by Mr. E. Crutchloe:—

	General.	Seats and Fittings.
Jerrard	£4,210	£283
F. Higgs	4,056	308
Gregory	3,975	355
Potter	3,480	810
Holliday & Greenwood	3,949	315
Turtle & Appleton	3,644	380
Merritt & Ashby	3,590	369
Howard & Dorrell	3,650	310
Roberts	3,648	270
Shurmur	3,609	333
King & Son	3,485	285
Smith	3,475	353

For the construction of roads and sewers, Wood-green, for Mr. H. A. Wickes, under the superintendence of Mr. William Eve, 10, Union-court, Old Broad-street, E.C.:—

Harris & Wardrop	£2,360	0	0
Killingback	2,241	0	0
Bell	1,924	0	0
Rowley	1,919	0	0
Mayo	1,830	0	0
Dunmore	1,807	0	0
Taylor, Wedmore-street, Holloway*	1,498	0	0

* Accepted.

For the erection of residence at Windsor. Mr. M. B. Adams, architect. Quantities by Mr. H. Lovegrove:—

Goddard	2,947	0	0
Watson	2,913	0	0
Hann	2,859	0	0
Hickinbotham	2,825	0	0
Holliday & Greenwood	2,747	0	0
Martin, Wells, & Co. (accepted)	2,690	0	0

For completing six houses, 13 to 18, Branksome-road, Brixton-rise. Mr. Charles Sewell, architect:—

J. Beal	£1,047	0	0
B. Crook	975	0	0
Turtle & Appleton	925	10	0
O. Craske	898	0	0

For the erection of teachers' residence and additions to Hackenthorpe School, for the Beighton School Board, Derbyshire. Messrs. Rollinson & Son, architects, Chesterfield:—

Sykes	£1,950	0	0
Drabble	1,950	0	0
Chadwick & Co.	1,945	0	0
Greenwood	1,923	0	0
Fisher, Bros.	1,860	0	0
Hardcastle	1,800	0	0
J. Fidler	1,770	0	0
Fidler, Bros. (accepted)	1,625	5	0

For the erection of a brick church, Danesmoor, Derbyshire. Messrs. Rollinson & Son, architects:—

Hays	£575	0	0
Margereson	572	0	0
Roe	561	10	0
Gough	561	0	0
Forrest	557	0	0
Cropper	554	0	0
Tinkler	551	0	0
Potter	496	10	0

For additions and alterations to the union Workhouse, Chesterfield. Messrs. Rollinson & Son, architects:—

Cropper	£1,578	0	0
Forrest	1,497	16	8
Fanshawe	1,470	0	0
Hoole	1,460	13	0
Fisher, Bros.	1,460	0	0
Wright	1,455	0	0
Stevenson	1,450	0	0
Gough	1,411	0	0
Brown	1,404	17	0
Chadwick & Co.	1,400	0	0
Glossop	1,350	0	0
Knowles (accepted)	1,350	0	0

For the erection of additions to Shirland Schools, for the Shirland and Higham School Board. Messrs. Rollinson & Son, architects:—

Mason and Bricklayer's Work.

Cropper	£600	0	0
S. & G. Frisby	554	9	0
Fisher Bros.	543	0	0
Hingley	520	0	0
Hoole	485	0	0
Wain	475	0	0
Roe	439	17	6
Bingham	430	0	0
Margereson (accepted)	410	0	0

Carpenter and Joiner's Work.

Frisby	£365	3	0
Fisher Bros.	360	0	0
Hoole	355	0	0
Smedley	348	0	0
Hall	346	7	0
Whetton (accepted)	335	0	0
Wilson & Wain	328	10	0

Plumber's, &c., Work.

Dixon	£107	13	1½
Burnham	103	18	6
Jones	103	5	9
Frost & Son	101	12	8
Pearson	100	11	6
Frith (accepted)	98	7	0
Peat	97	0	0
Aiken	93	0	0

For alterations and additions to stabling, Wyvol's-court, Swallowfield, Reading, for Mr. R. J. McCabe. Mr. W. Ravenscroft, architect, Reading. Quantities by Messrs. Cooper & Sons, Maidenhead and Reading:—

Wheeler Bros., Reading (accepted)	£410	0	0

For additions, stabling, &c., to Park Villa, Heath-road, Leighton Buzzard, for Mr. Edward Edwards. Mr. Gotto, architect, Leighton Buzzard:—

Adams Bros., Heath, Leighton Buzzard	£394	0	0
William Whiting, Heath, Leighton Buzzard	375	0	0
T. P. Webb, Leighton Buzzard	366	0	0
Amos Miles, Heath, Leighton Buzzard	360	13	0
James Tutt, Leighton Buzzard	348	10	0
D. Cook & Sons (accepted)	340	10	0

For the erection of new stables at Exning Lodge, Exning, Suffolk, for Mr. E. Martin. Mr. John Flatman, architect, Newmarket:—

Wilkes	£2,152	0	0
Pate	1,833	10	0
Kerridge & Shaw	1,787	10	0
Kent	1,721	0	0
Simpson & Ruse	1,695	0	0
Smith	1,620	0	0
Hook & Tebbett (accepted)	1,579	0	0
Cowell	1,515	0	0

For the erection of additional offices at 15, Lamb's Conduit-street, for the Directors of the London Commercial Deposit Building Society. Mr. J. T. Lacey, 10, Buckingham-street, Strand, architect:—

W. H. Pritchard	£352	0	0
W. & H. Salmon	350	0	0
S. Hayworth	339	0	0
Langmead & Way	330	0	0
G. Brown	328	0	0
Thomas & Butland (accepted)	323	10	0

For erecting schools and houses adjoining, Radnor-street, St. Luke's. Messrs. Roumieu & Aitchison, architects. Quantities by Messrs. Welch & Atkinson:—

Dye	£6,984	0	0
Sabey	6,785	0	0
David King & Son	6,588	0	0
Pritchard	6,354	0	0
Nixon	6,311	0	0
Hobson	6,186	0	0
Nightingale	6,091	0	0
Brass	5,811	0	0

For alterations to 42, Cannon-street, for Messrs. Sterne & Co. Mr. John Whichcord, architect:—

David King & Son	£1,578	0	0
E. Lawrence	1,267	0	0

For the erection of an eight-quarter malting, Epsom, for Mr. C. Dagnall. Mr. Arthur Kinder, 11, Queen Victoria-street, architect. Quantities by Mr. Harold A. Kinder:—

C. J. Paine, Worcester Park	£485	0	0
G. Hards, Ewell	448	15	0
S. J. Evans, Carshalton (accepted)	398	0	0

For Maidstone hospital for infectious diseases. Messrs. Hubert Benstead, Maidstone, and W. Leonard Grant, Sittingbourne, joint architects:—

Bowyer, Upper Norwood	£4,444	0	0
Davis, Maidstone	4,308	0	0
Hayward & Paramor, Folkestone	4,300	0	0
Jones & Co., Gloucester	4,180	0	0
Paramor & Son, Margate	4,020	0	0
Harris & Son, Tunbridge Wells	4,000	0	0
Swain, London	3,956	0	0
Vaughan, Maidstone	3,747	0	0
Cox Bros. Maidstone	3,725	0	0
Naylar, Rochester	3,723	0	0
Geere, Stttingbourne	3,585	0	0
Clements, Maidstone	3,691	0	0
Avard, Maidstone (accepted)	3,630	0	0

For building two houses and shops in the Burdett-road, London, for Mr. Edward Good. Mr. John Hudson, architect:—

J. & H. Cocks, Mile-end	£1,114	0	0
Morton & Son, Stratford	1,053	0	0
Mark Gentry, Stratford	1,020	0	0
Hearle & Son, St. George's	945	0	0
Parrish & Hawker, Burdett-road*	819	0	0

* Accepted.

For general repairs to seventeen houses in the Tenter-ground, Goodman's-fields, for Mr. J. Davis. Mr. John Hudson, architect:—

Outhwaite & Son	£590	0	0
Read & Son	459	0	0
Gladding	420	0	0
Russell, Hackney (accepted)	399	10	0

For building stables, &c., at the Rising Sun public-house, Romford-road, East Ham, Essex. Mr. John Hudson, architect:—

Mark Gentry	£324	0	0
Norton & Son	334	0	0
J. & H. Cocks, Mile-end	273	0	0

For making up Crescent-road, Crouch-end, for the Hornsey Local Board. Mr. J. De Courcy Meade, surveyor:—

Bloomfield, Tottenham	£1,150	0	0
Jackson & Son, Finsbury Park	1,125	0	0
Pizzey, Crouch-end	952	0	0
McDowell & Dawson, Stoke Newington	919	0	0
Strachan & Co., Wood-green	905	0	0
Dunmore, Crouch-end	794	0	0
McKenzie, Williams, & Co., North-buildings, South-place, Finsbury*	791	0	0

* Accepted.

For alterations and additions at the Northcote tavern, Battersea-rise, and stables adjoining, for Mr. Geo. Phillp. Mr. Geo. Treacher, architect:—

John Beale (accepted)	£768	0	0

For pulling down and rebuilding the Yorkshire Grey tavern and shop adjoining, Langham-street, for Mr. T. Maguire. Mr. Geo. Treacher, architect. Quantities supplied by Mr. J. F. Wesley, Forest-gate:—

John Beale (accepted)	£3,130	0	0

For house at Ashtead, Surrey. Mr. H. C. Boyes, architect:—

G. Green	£1,776	0	0
M. Haisman	1,729	0	0
Gould & Brand	1,639	0	0

For a pair of semi-detached houses in the Elmfield-road, Bromley, Kent. Mr. St. Pierre Harris, architect. Quantities by Mr. C. Stanger:—

Wood	£2,817	0	0
Crossley	2,744	0	0
Payne	2,734	0	0
Grubb	2,676	0	0
Haisman	2,669	0	0
Taylor & Parfitt	2,555	0	0
Arnaud & Son	2,554	0	0
Balding	2,493	0	0
Taylor & Son	2,398	0	0

For additions and alteration to the Gordon Arms, Chislehurst, Kent. Mr. St. Pierre Harris, architect:—

Grover	£130	0	0

For erecting south boundary fence at the new portion of the cemetery for the parish of Tottenham. Mr. F. W. Searle, architect:—

Rowe	£1,925	0	0
Wells	1,799	0	0
Harris & Wardrop	1,744	0	0
Chapman	1,659	10	0
Bird & Co.	1,580	0	0
Johnson Bros.,	1,575	0	0
Lion Foundry Company (ironwork only)	693	9	8

For house at Mickleham, Surrey. Mr. John Norton, architect. Quantities by Mr. S. J. Thacker:—

Scofield	£7,390	0	0
Boyce	7,390	0	0
Kirk & Randall	7,300	0	0
Peto Bros.	7,289	0	0
Goddard	6,990	0	0
Sanders	6,949	0	0
Clark	6,932	0	0
Lawrance	6,719	9	9

For addition to the Springwells Brewery at Kegworth, near Derby. Mr. John Jackson, St. Alban's-chambers, Nottingham, architect:—

J. W. Vesty, Kegworth	£259	7	6
John Sharman, Kegworth	155	10	0
Pepper & Bramley, Kegworth	215	13	4
J. & G. Wilders, Kegworth (accepted)	210	0	0

For additions and alterations to Henfield Lodge, Henfield, Sussex, for Major Borrer. Mr. William Buck, architect, Horsham:—

Martin, Henfield	£1,452	10	0
Roberts, Henfield	1,429	0	0
Snewin & Son, Worthing	1,415	0	0
Pannett, Bros., Horsham	1,386	0	0
Hooker, Portslade	1,380	0	0
Woolgar & Son, Horsham	1,313	0	0
Miles, Portslade	1,250	0	0
Redford, Horsham (accepted)	1,246	5	0

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For Worsley private street improvements, consisting of the sewering draining, levelling, and laying foundations in Fereday-street, Victoria-street, Brackley-street, and Louisa-street, and in levelling and laying foundations, &c., in Granville-street, Dagmar-street, and Thorpe-street, for the Barton-upon-Irwell Sanitary Authority. Contract No 12. Quantities supplied by the engineer, Mr. John Price, C.E. :—

M. Naylor, Hulme	£1,559 13 0 !
G. Freeman, Hollinwood	1,350 12 0
F. Dawson, Bury	1,660 7 10
G. Unsworth, Moss Side	1,083 8 11
Sharples & Watson, Farnworth	1,039 6 0
J. Jackson, Walkden	1,014 12 8
J. Oakes, Kearsley	977 18 1
W. Hayes, Bolton	970 12 8
J. Mackay, Hereford	917 0 0
W. Pollitt, Bolton	889 13 1
J. Randall, Weaste	859 16 9
E. Bird, Chorlton (accepted)	854 0 0 !

For Worsley private street improvements, consisting of sewering, draining, levelling, and laying foundations in Back Granville-street, Back Fereday-street, Back Chaddock-road, and Back Wardley-street, for the Barton-upon-Irwell Sanitary Authority. Contract No. 13. Quantities supplied by the engineer, Mr. John Price, C.E. :—

M. Naylor, Hulme	£380 5 0
G. Freeman, Hollinwood	376 5 0
D. Holt, Bolton	332 18 6
J. Mackay, Hereford	289 0 0
G. Unsworth, Moss Side	284 4 6
W. Hayes, Bolton	276 16 11
F. Dawson, Bury	262 2 10
J. Oakes, Kearsley	254 5 6
J. Jackson, Walkden	247 17 7
J. Randall, Weaste	246 9 0
Sharples & Watson, Farnworth	245 0 0
W. Pollitt, Bolton	234 4 2
E. Bird, Chorlton (accepted)	230 0 0

For the plant and machinery of a new 60-quarter brewery, upon the Yorkshire system, for Mr. John Smith, Tadcaster, York. Messrs. Scamell & Colyer, engineers, 18 Great George-street, Westminster :—

Contract No. 3.—Boilers.

Tannett, Walker, & Co., Leeds	£1,685 0 0
Galloway & Sons, Manchester	1,470 0 0
R. Taylor & Sons, Marsden	1,440 0 0
Bradley & Craven, Wakefield	1,407 0 0
G. Waller & Co., London	1,399 0 0
Witham & Co., Leeds	1,350 0 0
Thornewill & Warham, Burton-on-Trent	1,290 0 0
Piggott & Co., Birmingham	1,258 0 0
Holdsworth & Sons, Bradford (accepted)	1,162 0 0

Contract No. 4.—Millwrights.

Bradley & Craven, Wakefield	£8,673 0 0
Oxley, Frome	7,100 0 0
Thornewill & Warham, Burton	7,095 0 0
H. Woods & Co., Manchester	7,010 0 0
G. Waller & Co. London	6,693 0 0
Wilson & Co., Frome	6,223 0 0
Pontifex & Wood, London	6,065 0 0

Contract No. 5.—Coppers.

H. Pontifex & Sons, London	£4,073 0 0
Shears & Sons, London	3,264 0 0
Bennett & Sons, London	3,225 0 0
Wilson & Co., Frome	2,794 0 0
Siddley & Co., Liverpool	2,770 0 0
Bindley & Briggs, Burton	2,750 0 0
Pontifex & Wood, London	2,715 0 0
Ramsden, London (accepted)	2,636 0 0

Contract No. 6.—Slate mason.

Braby & Co., London	£2,100 0 0
J. & J. Sharp, London	1,975 0 0
Carter, Liverpool	1,960 0 0
Ashton & Green, London	1,950 0 0
J. Stirling, London	1,930 0 0
Brindley & Co., London	1,929 0 0

No fermenting-tuns included in this contract.

Contract No. 7.—Pipes.

Bennett & Son, London	£5,725 0 0
Thornewill & Warham, Burton	5,656 0 0
Brindley & Briggs, Burton	5,350 0 0
Wilson & Co., Frome	5,269 0 0
Pontifex & Wood, London	4,009 0 0

Contract No. 8.—Refrigerators.

Lawrence & Co., London (accepted)	£716 0 0

Note.—The results of No. 1 contract, "Buildings," and No. 2 contract, "Girders, &c.," have been previously announced, viz. :—

No. 1. Armitage & Hodgson, Leeds	£22,103 0 0
No. 2. Dawson & Nunneley, Leeds	10,699 0 0

For the erection of new Wesleyan Chapel at Ryde, Isle of Wight. Mr. Charles Bell, architect. Quantities by Mr. H. Lovegrove, 26, Budge-row, Cannon-street :—

Newman	£5,990 0 0
Ward	5,315 0 0
Martin, Wells, & Co.	5,189 0 0
Breader	4,950 0 0
Jenkins Bros.	4,780 0 0
Harris & Son	4,770 0 0
Evans Bros.	4,753 0 0
Gregar	4,744 0 0
Sibley	4,736 0 0
Jones	4,650 0 0
Cooper	4,628 0 0
Barton (accepted)	4,310 0 0
Morris	4,100 0 0

For the erection of residence, stables, &c., at Grimsby, for Mr. Alderman Smethurst, J.P. Mr. Charles Bell, architect. Quantities by Mr. H. Lovegrove :—

Emerson	£4,984 4 11
Smith	3,949 14 0
Guy	3,942 5 10
Willows	3,828 9 0
Doughty	3,614 16 0
Snowden	3,612 19 0
Fletcher	3,604 6 6
Thompson	3,577 14 0
Chapman	3,395 12 4
Topham	3,385 18 0

For the erection of three warehouses in Smithfield. Mr. W. Cook, architect :—

B. Brown	£5,682 0 0
G. Crabb (accepted)	5,516 0 0

TO CORRESPONDENTS.

M. J. L. (we cannot find space. Moreover, the assertion that colour is used is substantiated by other correspondents). J. O. R. (should have sent names and amounts). E. C. (under our mark). J. H. C. M. (received). F. W. C. (received. Shall appear). Architect (we cannot pretend to write letters in reply). J. G.—C. B. K.—G. R.—G. R.—H. H. B.—J. M.—S. & C.—C. P.—J. P.—J. C.—J. A. H.—G. A. L.—W. S.—J. H.—R. F. G.—J. W. C.—J. B.—O. C.—C. B.—H. C. H.—S. M. & Co.—W. B.—H. I. N.—B. G.—H. H.—W. de G. B.—W. N. A.—W. R.—S. & G.—W. W. L.—J. B. C. C. H.—W. P.—D. K. & Son.—W. C. C.—W. H. C.—A. V.—P. G. S.—Mrs. F. R. W.—J. N.—T. R. S.—M. & Co.—S. H.—F. W. H.

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The Builder.

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Some Recent Discoveries on the Art of the Etruscans.

THERE must be few of the reading public who have not been charmed this season with the work of one of our popular novelists, the scene of which is laid in the all but deserted Maremma. The portion of Italy which lies between Leghorn and Civita Vecchia has always possessed something more than an ordinary interest for the traveller and the archæologist. The melancholy and fever-stricken Maremma, and the neighbourhood of the classic Lake Trasimene, have long been regarded by the antiquary as a prolific field for research; and it scarcely required the imagination of the romancist's art to add in any degree to the interest that attaches to that portion of Italy known as Etruria. But in spite of the innumerable relics which we possess of the civilisation of the Etruscans, notwithstanding the wealth of every European museum in Etruscan antiquities,* research has been singularly baffled for the three centuries that the great necropolis of Central Italy has continued to supply its yield of archæological treasure. We have learned more of late years of Egypt, Assyria, Chaldæa, Asia, America, and the pre-historic races than of the story of the early inhabitants of the classic peninsula with which we have for generations past been made familiar. So little, indeed, has been discovered concerning the Etruscans and their tombs with the quaintly smiling figures filling case after case in our great museums, that there are not wanting those who urge the uselessness of further research in this direction. But fortunately archæologists are a happy race, not to be deterred by ill success from the prosecution of their studies. In the research which has now for so many generations been carried on to acquire some definite information respecting the Etruscans, fortune may be said finally to have blessed the efforts of the antiquaries.

Etruria, till the days of "the iron way" a difficult and even dangerous portion of the country to penetrate, is now comparatively easy of access. But though modern activity has facilitated the approach to the Maremma, the district still remains, fortunately, almost as little invaded by the omnipresent modern traveller, as it was in the days when Dennis wrote his fascinating and familiar volumes. And yet the district possesses an interest more than common. This interest may be said especially to centre round Corneto, where within the last few months a series of excavations has brought to light some most invaluable relics of the past civilisation of Etruria.

Corneto is a small town situated between Orbetello and Civita Vecchia. It is now easy of access, thanks to the railroad, and the interest of the visit at this season of the year, when the swallows are preparing to flit southwards, will well repay any fatigue. Opposite Corneto lies the site of Tarquinii, one of the largest and most important cities of Etruria, at a time when the Maremma, now a fever-stricken tract, was a habitable, well-cultivated district the Etruscans had skilfully reclaimed from the state to which their descendants have again, through their neglect, allowed it to degenerate. Corneto, which to the lover of mediæval and Renaissance art offers not a few elements of study,* owes, however, its chief interest to its Etruscan antiquities, and this the municipality have with wisdom understood.

The Etruscan tombs which have been the scene of the recent excavations,—the result of which it is our intention to lay before our readers,—lie scattered over the very hill on which Corneto is built, it having been the necropolis of Tarquinii. It is beyond the limits at our disposal to enter into any lengthy description of these interesting Etruscan remains, which have been the subject of a very long and learned paper recently published in the pages of the *Revue des Deux Mondes* by the well-known archæologist, M. Gaston Boissier. We shall simply endeavour to summarise as briefly as possible the contents of this article with a view to placing before our readers the chief results of the recent discoveries made in the tombs at Corneto respecting the mysterious art of the Etruscans. It is to the labours of the eminent scholar, Herr Helbig (whose connexion with the German Archæological Institute of Rome has long rendered his name familiar to readers), that we are chiefly indebted for the fund of information now at our disposal, and his careful research among the tombs at Corneto has, we think it will be seen, enabled him to most satisfactorily solve many very involved and intricate points respecting what has so far appeared puzzling in the art and civilisation of the Etruscans.

What especially increases the interest of these tombs,—a description of the art represented in which would lead us beyond our limits,—is the fact that they form our chief and only trustworthy source of information respecting the Etruscans, their language having remained as yet an enigma to the archæologists. Problems apparently far more difficult to solve have been satisfactorily dealt with; the inscriptions of Egypt and Assyria we now read with comparative facility; those of the Etruscans remain as yet a dead letter to us, yet their language was one spoken till the time of the Roman Empire; the inscriptions in our possession are numerous, and consisting mostly of epitaphs, might be, it would be supposed, easily understood; but each student interprets their meaning differently. After a century of study we are no further advanced than when Lanzi (1789) published his *Saggio di Lingua Etrusca*. The promising labours of Corssen* were only very recently interrupted by his death; the archæologists, in fact, have been so far fairly baffled in their researches respecting the Etruscans. Their language remaining for the present unreadable, we have no other means of judging of their life than through their tombs and the art they display. As yet, even a definite chronology has not been established. The monuments of Etruria being in almost every case imitations of foreign examples, it is alone by comparing them with those of Egypt, of Assyria, and of Greece that it is possible to assign them to any school or any date. Those who prosecute the inquiry must, therefore, be familiar with the whole known art of antiquity.

Among the tombs, the oldest, it is true, are easily distinguished. This year the excavations pursued at Corneto have brought to light a number of tombs of evident antiquity. These are mostly simply composed of a round hole some 5 ft. broad, and 6 ft. to 9 ft. deep, an urn containing the ashes of the dead being placed at the bottom of each. About the urn are arranged the different objects which the piety of the survivors desired to preserve, such as bracelets and fibulæ of bronze, in some cases hand-made vases of greyish black clay, decorated (when not entirely plain) with a purely geometrical incised pattern; such vases most of the European museums have long possessed, and their interest lies chiefly in their proving the early existence of that desire for decoration, for the superfluous, in fact, which marks the first stages of civilisation, the growth of the germs of a brilliant future art. In these antique tombs neither gold nor iron is to be found. In what are known as the *terremare* of Northern Italy have been discovered among the remains of villages built on piles and belonging to the bronze age, vases strikingly resembling those recently found at Corneto, and evidently belonging to a civilisation only one degree or so behind that of archaic Etruria. The archæologists may, therefore, now be said to be in possession of the elements of the entire progres-

* The new Etruscan Room in the British Museum has received in these pages a lengthy notice.—See *Builder*, vol. xli., p. 623.

* The superb Palazzo Vitelleschi, and the interesting Church of Sta. Maria in Castello, untouched in its twelfth-century simplicity, are both remarkable works.

* Corssen published in 1876 "Beitrage zur italischen Sprach kunde." His work, "Ueber die Sprache der Etrusker," illustrated, appeared in 1874-75.

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sive civilisation of Italy, from its earliest productions down to what we all understand as classic times. One point is worthy of attention; archæological research has brought to light in almost every portion of the Italian peninsula similar relics, a fact which would go far to show that there existed in these primitive days a greater and more widespread degree of civilisation than is generally believed; this civilisation, however, we find very unequally distributed. Italy, when it was conquered by the Romans, did not become entirely Roman. In the midst of the general culture there still remained some isolated spots of barbarism. History is unable to point to these, and here it is that archæology steps in to reveal their existence. As an instance, recent excavations made at Este have unearthed works of art which, though known (from the presence of a coin) to be of the Augustan age, might easily be mistaken for the work of two or three centuries earlier.

Etruria, however, rapidly developed an advanced civilisation. Tarquinii especially, situated as it was near the sea-coast, received at an early date the visits of merchants and traders from the East. A curious tomb, discovered only last January, singularly proves this fact; in this tomb, that of a young girl buried with all her jewelry about her, were brought to light, among a number of pieces of bronze and goldsmith's work, several pieces of amber. The presence of these evidences of refinement represents a first step on the road of luxury which we see later on leading to a high degree of elegance.

The period which follows presents a marked progress. For the first time we meet with those beautiful black vases termed by the Italians *casi di bucchero nero*; in the early periods smooth, and then ornamented with reliefs. Later on these vases, then doubtless deemed the perfection of the potter's art, we see ridiculed by the Romans as "old black pottery," which it required Martial's satire to recall to his countrymen had, however, once served the great king Porsenna. The tombs containing these vases have yielded numerous other objects, scarabæi in *pietra dura*, delicate jewelry, and, above all, perfume-vases strangely decorated with chimerical figures of a markedly Assyrian type. Beyond question, these vases are of Oriental origin, and how they reached Italy modern research has come forward to explain by the commercial activity of the Phœnicians. Recent authorities lean to the supposition that these Phœnician objects came from the colony of Carthage, and hence a definite date can at length be arrived at. Herr Helbig traces back the Phœnician trade to about the seventh century before the Christian era. With the sixth century, while Rome was still unimportant, the trade between Carthage and Italy was most active, and to this period we may attribute the large importation of Oriental objects found in the tombs of Italy.*

This point settled, a great advance is made in our acquaintance with Etruscan civilisation, the presence in which of elements, evidently Oriental, has long puzzled the archæologists. But the influence of Asia on the art and industry of the Etruscans has in no way any connexion with their origin. We continue to remain in doubt on this point, but the problem is relieved of one difficulty, and is thus brought nearer a definite solution.

Free Library at Twickenham.—Twickenham has set a good example to other and more considerable places by the adoption of the Free Libraries Act. Its Free Library was opened to the public on Monday morning, without ceremony, at the Town-hall, the owner of which, Sir Charles Freake, has generously placed a suite of rooms at the disposal of the committee until their funds will admit of the erection of a permanent free library building. This is only one of many ways in which Sir Charles Freake has sought to benefit the town. We trust that means will soon be forthcoming for the erection of the permanent home of the library.

* M. François Lenormant (whose position as an archæologist is well known in this country) is inclined, while thoroughly accepting the theory of Herr Helbig, to urge a certain share of credit to the Greeks, who also imitated the products of Egypt and Assyria; and this view the eminent antiquary has been able to support by the evidence of several vases discovered by him at Vulci and Cervetri.

A GERMAN CRITIC ON ENGLISH ARCHITECTURE.

An observant German critic, whose account of the progress of the minor arts in England we reproduced in a recent number, has now given his impressions of the state of architecture in this country. In this art, which, according to the opinions of some of the greatest thinkers, is the root of all the other plastic arts, there is, according to Herr Zimmern, undoubtedly a very lively interest taken in England. At the present moment the art of house-building amongst us is in a transition stage. Like all the other arts subservient to the wants of ordinary life, this department of architecture has, of late, undergone a remarkable change. As in many other cases, the change has taken the form of a revival of older models. It has led to a good deal of national self-condemnation, to the disparagement of everything modern, and laudation of the distant past, whose best productions are still preserved while the less valuable have disappeared. How far the present state of things merits the disdain shown by one party or the praise passed upon it by another school, is a question open to debate. But all critics are agreed that the condition of affairs which immediately preceded the present was about as bad as possible. The worst of it was that men were blissfully in the dark as to their own ignorance. There was a time when Englishmen were quite content that row after row of stucco-covered houses should be built of undeviating similarity, all being alike unbeautiful, both as regards design and materials. The iron railings in front of these houses were all after the same pattern. Street after street arose upon the same monotonous model in all the towns of England. Nor were their architects and builders awakened either by their own feeling or by the voice of their neighbours to the consciousness that there was any imperfection in their work. On the contrary, while, for instance, Gower-street has now become proverbial for its stiff uniformity or monotony, there is a topographical history of London belonging to the days when Gower-street was built which speaks with delight of its majesty and beauty, and of the honour it reflected upon its noble proprietor. And from that period,—that is, the earliest years of the present century,—things have been constantly going downhill.

The small houses of the suburbs of London are almost without exception very ordinary and common as regards design. They are, as regards material, cheap almost to worthlessness, and dishonest in construction. Where there are ornaments they are faulty and insignificant.

Fortunately, however, the time has come when we are no longer content with this state of things. Englishmen have arrived at the perception that the new parts of a town have no need to be ugly as a matter of course. They have seen that ancient houses, even in towns, present forms that are not so wearisome to the eye. They have begun vehemently to condemn the men who covered the land with long rows of villas, shops, and residences, all destitute of variety. English architects looked round and glanced backwards. They observed that the ancestors of Englishmen had built solid red brick walls and pointed roofs, a style in which there are many country houses still existing,—and they commenced to design occasional houses after this model. Thus for some time past new country houses and suburban villas have mostly been built of brick without stucco. Gables, dormer windows, and turrets have been becoming by degrees more frequent. At various points there are small projecting balconies, and deep portals have taken the place of the simple house doors.

This favourite style of building, which is named after Queen Anne, was at first revived for detached houses, and then for groups of single and semidetached villas. It was a long time before the style gained ground in the uniform rows of houses in London streets or squares; but finally a well-known architect, instead of the ordinary dirty-brown rectangular boxes of Bloomsbury-square, had built for himself there a house in common unstuccoed brick, with the deep portal, the pointed roof, and the broad windows of the above-mentioned style, for whose spread this master has done so much in other districts. The house is not, perhaps, one of his happiest efforts; yet it forms so pleasant a break in the monotony of the square in question that every one who has frequently to pass there cannot but be sincerely grateful for it. In Kensington there soon arose one red-brick house after another, with numerous projecting corners, points, and gables. Such a house is noticeable in the Exhibition-road, South Kensington. It is distinguished by a niche in the external wall, in which stands a blue porcelain ewer, an unusual ornament, which produces a most pleasant effect in the way of colour. In Hampstead, a district which has always been a favourite one with lovers of art, the Queen Anne style has become the predominant one, and there some of the finest buildings of this description are to be found. A new street, called Fitz-John's-avenue, is inhabited mostly by artists, and the new houses, many of which are not yet completed, form typical examples of the modern English style of building. There we see clearly manifested how much the appearance of a street gains by variety. Hardly two houses are to be seen there alike, except in the case of the semi-detached or double villas. They are all different in design and colour, but the materials employed are in almost every case brick, while the designs are mostly widely different from the square box-like form that once satisfied us. Although these houses are still new, and have the naked and rather glaring appearance which is almost unavoidable in the case of new houses, they nevertheless present even now a perspective which charms and delights the eye. By this it is not intended to assert that every house in Fitz-John-avenue is satisfactory in architectonic respects. But the effect upon the whole is refreshing, the colour of the roofs in particular has this effect. They are mostly covered with tiles, instead of slate, and these quite surprise the ordinary Londoner, who is accustomed to walk about the long grey streets without knowing why they produce such a gloomy effect. He has no experience of the fact that a row of houses may present agreeable colours.

A short distance from London, in Bedford Park, Turnham Green, the Queen Anne style has attained a remarkable degree of development. There, a gentleman, owner of some hundred acres in that district, conceived some years ago the idea of covering the entire estate with houses of this description. He believed that the dearness of such buildings at that time was ascribable to their comparative rarity. He thought that the cost of erecting, so to speak, an entire village in this style could not prove excessive, while such dwellings were sure to be greatly in demand. He employed the services of Mr. Norman Shaw as architect, a gentleman who, perhaps more than any one else in England, has contributed to the revival of this old style. Plans were prepared by him, and afterwards by other architects, and monotony was most carefully avoided. The roads were made winding, and the houses either stand quite detached or are in pairs, semi-detached. In order to increase the charm presented by variety, the old trees that were on this estate have been carefully preserved, while young ones have been planted along the streets. This bold experiment of Mr. Carr's, for which at first a complete failure was prophesied, has proved most successful. Bedford Park has become quite a noticeable part. Everybody speaks of it. The newspapers publish articles about it, and the houses are eagerly sought after. Within a period of barely six years several hundred houses, a church, a club-house, and a supply store have risen up in the district. The general effect produced by the village is charming. The houses are all of convenient moderate dimensions, and are nowhere pretentious. Few are entirely alike, though all have a generally similar character. They do not stand shoulder to shoulder, but each has its bit of garden-ground, which is often, as we have said, adorned with old trees. The gardens are railed in with unpainted wooden fence of rural appearance. The wooden window-frames and balcony rails are painted white or green. The roofs are covered with tiles, and, in order to soften their glaring appearance, old tiles have been employed along with new ones. The lower window panes are frequently of painted glass. Sometimes the entire window consists of a number of small panes framed in lead, such as up to a few years ago were only seen in very old houses or cottages. There are no shops, as the wants of this colony of villas are supplied by the stores of the association. A school of art, erected in a picturesque style, exists in the village, and there is an inn of still more picturesque appear-

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ance. It is named after the hostelry which has been rendered immortal by Chaucer as the starting point of his pilgrims. The whole is very pretty and pleasing, although it may have an appearance of imitation. The character of the community which has gathered here corresponds to the peculiar and idyllic character of the place. The inhabitants are not wealthy. The dwellings are not built for rich people, and yet among the denizens are artists of all kinds, painters, musicians, novellists, actors, and numerous artistic and art-loving personages. The prevailing tone of society there is pleasant, cheerful, companionable. The club-house possesses a library, billiard and conversation rooms, lawn-tennis grounds, grass plots for fine weather, and asphalted covered places for wet days; there is likewise a large dancing-hall and a theatre. The club is open to both sexes, and may be described as a kind of co-operative amusement association.

This is the favourable side of the picture; but, unfortunately, there is also an unfavourable side. On inspecting several of the new and still unoccupied houses, numerous faults have been disclosed, and they are such as considerably to diminish the desire to take up a residence in this paradise. In the brick walls, whose colour produces so pretty an effect, it is found that the bricks are more or less cracked, and there is no doubt that shortly they will be penetrated by dampness. The ornamental tile roofs, too, have failed to withstand the heavy rains which have fallen in the past summer. It is not that the tiles are a bad material for roofing; only they have not been laid so as sufficiently to cover one another. Again, some of the woodwork in the rooms has proved to have been badly done. As soon as the doors dry a little, cracks show themselves in the panels. The door-locks are inferior, and the stoves of the new-fashioned chimneys are often bad. All these, however, are faults in carrying out the construction. They are not defects in the plan itself. It is not the architect, but the builder or operative, that is at fault. These facts are, according to the opinion of Herr Zimmern, a new proof of the demoralisation of operatives in general, and of the operative builder in particular; but we hold that he is clearly wrong in basing so sweeping a conclusion on such narrow data. We agree with him, however, in regretting that these defects should have shown themselves to such an extent at Bedford Park, as ignorant persons will be apt wrongly to ascribe them to the style of building instead of to the builders. There are some defects, however, arising from the style, defects which the tenants soon discover when they find that they have to pay more or less heavily for repairs. Woodwork has been employed in the Bedford Park houses after old models, without asking why they had gone out of use. Thus the outer frames of windows of wood can never be quite watertight, and hence wood had given way to other materials. The garden palings are not painted nor covered with metal. The unprotected woody fibres of the palings are, therefore, at once wet through at the points, and the natural consequence is rapid decay. In many of the houses a platform covered with cement is used, which serves as a roof for part of the lower story and as a balcony for the upper. The chimneys rising from this platform are of a height that is not artistic. In spite of this they do not reach to the upper-roof line, and it is well known that chimneys which are not carried beyond this line have the quality of smoking. The problem of providing chimneys at once elegant and practical has not been solved at Bedford Park. Some good chimneys are there, but only in the houses which were first built.

The church is also a work of Mr. Norman Shaw's; the style is also Queen Anne, and most observers will admit that, however well adapted to dwelling-houses for the middle classes, this style is not suited for ecclesiastical architecture. The church shows a want of beauty, dignity, and, we would also say, of soul. The internal woodwork is painted green. This is a departure from the healthy modern habit of allowing the grain of wood to be seen wherever practical. To coat the well protected wood of the interior of a church with paint appears just as absurd as it is not to paint the garden palings which are exposed to the weather. In both cases that rational adaptation which is the secret of all success in decorative art has been lost sight of. The architecture which is merely a fantastic revival or imitation can never be a living art. When the artist takes care that his work should, above all, be adapted to its aim and end, then it will be capable of living and show real progress. It is to the effort to attain complete appropriateness that the art works of the Greeks owe that perfection which no other nation has yet attained. In English architecture as in English clothing and domestic arrangements, it is too often the case that custom or fashion or the example of others is the guide rather than propriety or suitableness. At present the Queen Anne style has become the fashion; it is adopted by most architects, not because brick is a good material for building, or because it shows the construction and admits variety of form, but simply because others have built according to this style, and they wish to follow the example. There is a lack of feeling for the internal laws of architecture, and hence external forms are applied without understanding or purpose. Gables, dormer windows, and projecting corners have been introduced for their own sakes. Rational sense has almost everywhere been sacrificed to picturesque effect, and so the artistic spirit, which is based on reason, is lost. Nevertheless it is a great advance that the meaningless monotony that once ruled in England is broken through, and that the attention of Englishmen has been actively turned to the exterior of their dwelling-houses. There has hardly yet been sufficient time to reach the rational middle path, but it seems to us that the efforts of recent years, in spite of all defects and faults, have given us the germ of a style which is capable of living.

In another branch of English architecture remarkable things have been accomplished in recent years. Since the passing of the Act making education of the people obligatory, there has been a need for large elementary schools. Thus it is that in almost all the larger towns one or more such schools has been built. For their designs there were no traditional prescriptions. The requirements were clear: durability, avoidance of all unnecessary ornament, light, ventilation, and lofty rooms. To satisfy these requirements, schools have been built that exactly fulfil their purpose, and by this very fact of being adapted to their ends no small degree of architectural merit has been attained. They are large high buildings, constructed of brick, and frequently with a bell-tower serving as a ventilation shaft. The walls, which are not covered with anything in the interior, and show the bricklayer's work, are well put together. The visible roofing is of good timber, and the joinery work well done. As playgrounds in wet weather, there are roomy arcades or open colonnades, the arches being often of truly noble dimensions, as pillars and posts had to be avoided to the utmost possible extent. The men who designed these edifices saw what was necessary, and carried it out excellently and in the simplest manner. The spirit out of which these productions have sprung fills us with more hope for the future than we feel when we see the houses which it has become the fashion to build in Queen Anne's style. Meanwhile, the old Classical style of masonry for which London was remarkable, but which is exceedingly unsuitable to the climate, is decidedly dying out. This is a great advantage. That in England we are gradually approaching the right road cannot be doubted. Already the streets of London have a far less monotonous aspect than that which had so long distinguished them.

TIMBER IN RUSSIA.

It is Mr. Gallenga, we think, who remarks, in the course of more than one of his accounts of travel, that he believes that far more than half the forests which existed at the date of his childhood have now been cut down, without any means being employed to keep up the supply of timber, the loss of which will undoubtedly begin to be felt by the world at no remote date, as agricultural effects, depending on climate, water-supply, and other circumstances, in which the destruction of woods have been the chief cause, have already been felt, and at last recognised, in many parts of Europe. Russia, where wood constitutes almost universally the sole building material, as well as the sole fuel, is already beginning to recognise the necessity of providing for the future in this respect. The northern forests will not last for ever, and they are now disappearing far more rapidly than they are replaced by either natural or artificial means. The trees, too, in these northern latitudes, are much longer in attaining a size suitable for timber than in warmer regions. Government domains especially suffer much depredation, for from them large quantities of timber are stolen during the winter, when the snow quickly obliterates all trace of the marauders, who are the peasants of the neighbouring districts. If this even were wholly put a stop to, however, the economical situation with regard to the wood supply, looked at as a whole, would be but little changed. The total consumption of wood would not presumably be very much greater, though it would be cut with more advantage. The Institute of Forestry, attached to the Petrovsky Agricultural Academy, is an excellent institution, under the management of an able professor, who has his heart in his work. Here a number of young men are instructed in the principles of forest management as far as these are at present known. The most economical ways of obtaining timber supply, the best way of planting, and the knowledge of soils suited to various trees, are demonstrated theoretically and practically. For indoor study there is a capacious and well-stocked laboratory, where numbers of earnest students may be seen absorbed in their work. A good library, supplied with the chief European and American periodical publications bearing upon the subjects upon which instruction is given, and various museums of practical scope, are among the aids to study which the visitor will there note. The present writer has to thank M. Ivanukof, one of the professors who gives instruction at the Academy, for his most obliging guidance and explanation during a visit made to this admirable establishment. M. Ivanukof, besides his high reputation as professor, is well known as a writer on subjects connected with land, and has travelled much for purposes of observation in both the Old and the New World. The College of Lyessovodstvo, or Forestry, has its special museum, which contains a great deal that is, or should be, interesting to the architect and builder, as well as to those more nearly concerned with the production, supply, and preparation of timber.

Among the curiosities is a highly-finished set of miniature tools used in the cultivation or hewing of timber. But specimens of practical instruments of different sorts will there be found, from Birmingham and other seats of iron manufacture. We remember noting an Irish spade, the peculiar elongated form of which resembles a tool much used in certain districts of Russia. One of the most important features of this museum is the section devoted to the investigation of blights, and there is a most interesting collection of blight insects, and of specimens of wood injured by them as well as by fungus, showing the way in which injuries of this sort are inflicted upon timber. The attention of students is particularly drawn to the study of blights, the mode of their propagation, as well as of remedies and preventives against them. This institution is doing an excellent work, though how far it may be able to cope with the denudation of the forest tracts at present going on it is impossible to say.

The forests of the Baltic provinces, which but a quarter of a century ago seemed inexhaustible, are now disappearing at a too rapid rate. Twenty years ago the little port of Liban, which the grain trade is now elevating to importance, was surrounded with forests, and was accounted one of the chief centres of merchant shipbuilding in those provinces. Shipbuilding is now, however, reported to have quite ceased, owing to the absence of timber, all the woods in the immediate vicinity having been cut down, and there being no water communication to float timber from a distance to the spot. The wood consumed as fuel or employed for other purposes is at present mostly brought to the town by coasting boats from the north of Kurland, chiefly from Dondanhen, a locality which at present abounds in wood.

The vicissitudes of climate in Russia seem to have a bad effect upon the timber of telegraph-posts and railway-sleepers. On the 7th of August last, near the Chassof Yar Station, a whole passenger train completely left the rails. This accident, which might have had fearful consequences, is stated to be due entirely to the rotten condition of the sleepers, which, it is said, are much in the same state throughout the whole line on which this occurrence took place. An experiment is being tried on the St. Petersburg-Warsaw line of railway with the object of preserving the telegraph-poles from rotting,

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the preservative being salt, in a concentrated solution of which the poles are soaked.

The Government has ordered the preparation of a precise and detailed report of all damage and depreciation suffered by the Russian railways during the years 1879, 1880, and 1881.

It seems pretty conclusively shown that the recent accident on the Nikolaevsky railway was due to the rotten condition of the sleepers. Some of these were so soft that even the point of an umbrella or walking-stick would penetrate them. Many of the passengers who were uninjured, on escaping from the carriages, seized bits of the sleepers, wrapped them up in shawls or wrappers, and treasured them carefully until arrival in St. Petersburg, where they took them to show to the Minister of Roads and Highways. Attempts have occasionally been made to lay such accidents upon the rails, which sometimes break, but, as this is believed to happen only in very severe frosts, no such cause can have occasioned the recent accident.

These facts read rather curiously by the side of a memoir upon the present condition of the Russian railways recently published by the Government in the columns of the Government *Gazette*. In the course of this document the public is told that the considerable sums granted by the Government in recent years for the improvement of the lines, the diminished amount of construction of new lines, and the application of funds from the railway profits to the amelioration of the permanent way, have all been directed towards securing the efficiency of the railroads throughout the empire. So that "at present the ballast, sleepers, and metals upon all the railroads are in the conditions requisite for safety of locomotion, and, indeed, upon some lines in an irreproachable state of efficiency. This is in a large measure owing to the system of constantly renewing the sleepers which has been followed of late years." (!)

THE ARCHITECTURE OF CAIRO.*

The mosque built by order of Amr after his conquest of Egypt (A.D. 640) is now the oldest specimen existing of Arab or Saracenic architecture; the mosque erected by Omar at Jerusalem having been, it may be remembered, rebuilt on a new plan in the eightieth year of the Hejira by Sultan Walid, who covered the edifice with a dome of copper gilt, looted from a church at Baalbek; this sultan, it may be mentioned, was the first to build a minaret, now so essential a feature of every mosque. At the time the mosque of Amr was built, the Arabs had only recently seized Egypt, the first of their long line of brilliant conquests. They possessed, as we have already shown, no art of their own, and especially no architecture. The mosque of Amr was built, so tradition tells us, by a newly-converted Christian, who, as was customary in those, and even in much later days, employed for his purpose the materials of previously-existing buildings. Egyptian, Greek, Roman, and Byzantine relics will be found worked up throughout the whole of the older portions of the mosque. The plan is a large square. The presence of arches that are undoubtedly pointed has more than once been drawn attention to as bearing on the much-disputed question of their first appearance. Certainly their existence is curious here, as also in the contemporary mosque of El Aksah at Jerusalem,—in buildings, that is, of the seventh century.

More than two centuries were to elapse after the erection of the mosque of Amr before any great architectural feature was added to Cairo. The general disposition of the mosque of Teyloun or Touloun, built in A.D. 876,† is similar to that of the mosque of Amr. It is built of red brick, covered with stucco, and, though of coarse execution, is not unjustly regarded as a model of elegance and grandeur; the taste for excessive ornament, which was to mark the Arab art of later times, had not yet made its appearance. But the chief interest of this mosque arises from the fact that it may be regarded as the definite point of departure of Arab or Saracenic architecture. "It is from the mosque of Touloun," remarks Fergusson, "that we must date the complete foundation of the new style. Although there is considerable difficulty in tracing the history of the style from the erection of the mosques of Damascus and Jerusalem to that of Touloun, there is none from that time onwards. Cairo alone furnishes nearly sufficient material for the purpose." With so respectable an antiquity it can be understood that the mosque of Touloun, like that of Amr, in spite of frequent restoration and repair, has now fallen, in the hands of the Turks, into that sad state of ruin which is only too characteristic of all the finer old cities of the East.

Gama el Azhar (A.D. 969-981) is one of the oldest mosques of Cairo, its foundation dating from that of the city proper. An inscription determines the date and name of its founder,—Djouhar, the general of the armies of the Caliph Moez-el-Din-Illah, the builder of the existing city of Cairo. In plan, El Azhar, the brilliant mosque, as it is termed, resembles that of Amr. It contains no fewer than 380 columns, disposed in nine ranks; they are mostly from buildings belonging to the Lower Empire, and, as may be imagined, are of the most varied materials,—marble, granite, and porphyry,—all coupled with the most heterogeneous selection of capitals and bases. In the course of centuries the mosque, an object of the utmost veneration with the Mussulmans, having been frequently repaired, forms, in itself, a monument illustrative of the development of Saracenic art; but its sacred character renders access to it by all but believers impossible, or beset with the utmost difficulty. A college was early established in connexion with the mosque, and here, from every portion of the Mahometan world, students have come for centuries to acquire an acquaintance with the Mussulman religion.

Of the mosque of El Hakem Biamrillah (A.D. 1003), only a few pillars remain. The Gama el Daher is of A.D. 1266. Here the windows are all pointed, and filled with the stucco tracery so peculiar to the Saracenic style and character. The Mosque of El Daher is contemporary with the Alhambra, with the wonders of which there are many of the ornaments executed in stone and stucco in the Mosque of El Daher that might well vie; but, as will be remarked in the buildings of the best period, the decoration will be found to be broadly distributed; it possesses none of that confused intricacy which forms too conspicuous a feature of the Moorish work.

To the year 1356 belongs the great mosque of the Sultan Hassan, in some respects one of the most remarkable mosques ever erected. "Islamism," remarked the Arab historian Makrisy, "possesses no temple that can be compared to the mosque of the Sultan Hassan for the height and grandeur of the building and for the beauty of its architecture." The mosque is, indeed, for the boldness of its design, its graceful cupola, its delicate minarets, its imposing grandeur generally, and, in detail, its wealth of marble and coloured decoration, its brilliant and varied arabesques, one of the most beautiful monuments of Islamism. Not a small portion of its effect is due, in some measure, to the irregularity of the ground-plan forced on the architect by the circumstances of the site, so successfully dealt with that a thoroughly Oriental tradition relates how the Sultan Hassan caused the right hand of the unfortunate artist to be cut off that he might never trace a rival to the mosque he had erected. Any detailed description such as this work of art merits would be out of place when our space has already been so largely intruded upon.

To the year 1386 belongs the mosque, or rather mosques, of El Barkook (the first of the Circassian mameluke sultans), monuments which Fergusson strangely attributes to the twelfth century (A.D. 1149), not unreasonably remarking on the great change which had come over the style in the period that succeeded the mosque El Azhar, next to which he classes chronologically the mosques of El Barkook.

To 1414 belongs the Gama el Moyed, a "mixed mosque," largely built of older materials, set together in the most incongruous manner; the strongly-marked character of the purest Arab style is, however, plainly stamped on the building.

To 1466 belong the mosques of Qayt or Kait Bay, one *intra muros* the other *extra muros*, both masterpieces of the art of fifteenth-century Saracenic art.

With the early years of the sixteenth century (1517) Egypt became, through conquest, what it has since remained, a province of the Ottoman Empire; from this moment Cairo ceases to be the centre of an active and creative original art. The mosques erected after this time are mere imitations of those at Constantinople, Santa Sophia serving henceforth as the model. In the Gama Khairbekyeh (1520) the Arab art is still pure, the mosque ranking among the most beautiful in Cairo, but the Turkish influence can already be traced. A visit to the mosques erected after this time shows painfully through all the wealth of beauty the decline of the once pure art of the Arabs. As affording the means of comparison, Prisse d'Avennes has given us in his work a representation of the mosque El Sinanieh of the date 1569. Through the succeeding centuries a few mosques continue to be erected, but their interest is alone derived from the still lingering traditions of their decoration. With the political revival in this century these few artistic traditions fled before the pretentious productions of the refugee Italian architects employed by the successive viceroys to adorn and Europeanise their capital. This period can scarcely be said to have yet passed away. The last fifteen years have seen terrible changes in Cairo. Broad glaring streets have been ruthlessly cut through a city whose chiefest charm lay in its narrow cool and picturesque thoroughfares; pseudo-Parisian houses have been erected in every direction, and, not least destructive element, restoration has been carried out too often by far from competent officials.

With the new era which now seems promised to Egypt there is, we are afraid, from an artistic point of view, ground for alarm; we may hope, however, that the interests of art will not be neglected. Cairo is a city which appeals peculiarly to the artist and the archæologist; it offers in its too little known monuments a field of research which will well repay the enthusiastic student whose presence, be he English, American, French, Italian, or Russian, we may depend upon it, will soon follow the restoration of order on the banks of the Father of the Waters.

* See p. 389, *ante*.

† M. Prisse d'Avennes, as we have already stated, is our chief authority.

SIR EDMUND BECKETT ON SCIENCE AND ART.

Before presenting the prizes awarded after the examinations in the St. Alban's School of Science and Art, Sir Edmund Beckett, who resides in the neighbourhood, delivered a lengthy address. Some of the more striking portions may be interesting to our readers:—

If I were only to do my duty,—all that is formally required of me,—I should simply present the pupils with the prizes; but I am afraid they would be disappointed if that was all I did, for there is a passion for talking which distinguishes Englishmen and Englishwomen, which has caused a number of my hearers to come here. I have seen an archbishop, in distributing prizes, try for an hour to vary the monotony of telling young gentlemen and young ladies of the pleasure he had in handing them their prizes, but he was not particularly successful, and therefore I will not attempt to do that. Perhaps the best thing will be that I should make some general remarks beforehand. I must confess, however, that I am in a state of extraordinary ignorance on the subject. Science is a very good thing, and art, in its way, is a very good thing too. But I am afraid that the meaning of both words is a good deal less understood than it should be. I am afraid that the two things are commonly put together nowadays owing to a misunderstanding. I heard the late Cardinal Wiseman give a lecture on the Connexion of Science and Art, and if any one could have made a good case as to the supposed connexion I am sure the Cardinal could. He set to work, gave a very ingenious and amusing lecture, full of eloquence, such as I wish I could give you. At the end of the lecture I amused myself by thinking "how much real connexion between the two subjects has this gentleman shown?" It resolved itself into this. Being a distinguished person in the Church of Rome, and having spent a great deal of time in Rome, he naturally talked about St. Peter's,—a triumph of art of a certain kind. What he said was something to this effect:—"St. Peter's is a very famous place; its dome is almost the largest in the world, and, taking the height and the width together, it is really the largest in the world. But the dome is cracked, and the people set about to mend it."

That was very shabby language to use about such a thing as St. Peter's; but I am in the habit of boiling things down, and seeing what

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the meaning of a thing is when reduced to its simplest elements. The best case the Cardinal could make out was that the dome of St. Peter's got cracked, and that scientific men set to work to mend it, and mended it by putting a chain round it. That is not the most beautiful style of mending a crack, and it does not seem to say much for science connected with art. It seems rather like a severance; it appears to show that the artistic people who designed the dome had not much science, and it certainly demonstrates that the scientific people had not much art.

I have been thinking about a good many things of the same kind with a view to finding connexion between science and art, and could never find any until the other day I read in one of the papers as to these classes that the students painted on china, and that the china was fired or burned afterwards to make the colours fast. This is a combination of science and art, no doubt. The art of painting would not do much in regard to china without the science or art of burning. Art means a good many things. There is the art of making bread, and the art of making clothes. The people who call themselves artists are very numerous indeed. I have had to do a good deal with architects, and always found that, for some reason or other, they wish to call themselves artists, though I have never been able to make out why. It seems to me that an architect is not an artist. An artist must do something with his fingers; he does not work with his mind only. An architect does not do anything with his fingers; he merely makes drawings, and tells other people how they are to do the work. A number of people claim the title of artists with much better reason than architects. Painters and sculptors are artists; there is no doubt about them. In modern times singers are called artists in the newspapers; I do not know much about singing, and never go to the opera. Actors are often called artists. Going a little further down, I think I have heard hairdressers called artists. Dressmakers are frequently called artists; and I know also that tailors are called artists. So they ought to be, because they produce very excellent results, and I am not sure but that when they have good subjects to work upon,—very unlike myself,—they produce more successful results than architects generally.

I remember once giving tremendous offence at the Architectural Museum, or some such place, where I was making a speech, by venturing to say that the carvers who executed the ornamental work, such as is now going on at St. Alban's Abbey, were really people almost of as much importance as the architects themselves. Of course the architects glared at me, and some would not speak to me for a week after. Yet, surely, a carver is an artist. The man gets up on a scaffold, and with his few tools chisels out flowers and heads, such as may now be seen by going to the west front of the Abbey. An architect can do nothing of the kind, though he may do what is much greater if he does it well. Art, if it means anything, means the art to do something; it may be a good or a bad thing; by usage it may come to be associated with a beautiful thing, or what people call beautiful. But it is very difficult to say what is beautiful, for there is no canon of beauty that I know of,—no rule except following the example of Nature. There is no unquestionable standard of beauty except Nature. Nature never copies herself. There are millions of leaves on trees, but I defy you to find two alike. This is a lesson I have endeavoured to impress upon the workmen with whom I have had to do here and elsewhere. They imitate to too great an extent. I urge them not to be too exact, but to use a little freedom, as Nature does and as the old builders did. I have pointed out to workmen over and over again pieces of old work. I have asked them to look at a moulding; examining it, at first the moulding seems to be the same throughout, but close inspection shows that the work varies. The old workmen were really artists, and they did as Nature does. They made both sides of their buildings tolerably alike and symmetrical, just as both legs and arms and the two sides of a man's face are alike. But let any one hold up his two hands and look closely at them, and he will find that they are different. The two sides of a person's face are not exactly alike. The same thing applies to the colours of animals. Did you ever find two dogs or tigers coloured alike, or with both sides alike? That is the way with Nature: she works by general uniformity and not by exact uniformity. Nature never copies herself. What I have said is the result of observation of Nature, which is the source of all beauty.

What do you mean by Nature? There are philosophers nowadays who are always ready to state that Nature does everything, and that what they call natural selection does everything. Professor Huxley, who is a most advanced philosopher (a gentleman who believes in nothing but matter and himself, as a great man said once),—is too much of a philosopher not to know the true meaning of Nature. He said, "Nature is only the general result of all causes." He might have said, "Nature is the result of all causes and the cause of no result." Nature cannot be talked of as if she were the inventor and creator of all things. Look at what the thing called Nature has done in the way of beauty. Some of you have been reading, no doubt, that the colours of flowers are produced spontaneously, or by the action of bees. That may be true to a certain extent, but consider to what a small extent it goes. What are bees fondest of? According to my observation in this neighbourhood, they are fondest of mignonette flowers and lime-trees. There is a fine tree of that kind in the rectory garden, and I never go there without being struck with the number of bees about that tree. How much colour have the bees managed to impart to those two favourites of theirs,—mignonette and the lime-tree? They are two of the dullest coloured things in nature. According to the philosophy to which I have referred, bees have been at work millions of years making colours, but they have laid none on those two things. I say, therefore, that they have been a very small cause. If bees made the colours of the trees, have they also made them the shape they are? Have they made the beauty of hills and dales and mountains, and all the forms of water and clouds, and ice and snow, and everything of that kind? It is the object of art to imitate Nature in pictures; and in other ways, by having regard to results, and the observation of methods and laws. Take the rainbow, the most beautiful thing in Nature, and the northern lights, or aurora borealis,—what has produced them?—the regular laws of Nature. Nature is the result of natural causes,—the action of all causes, the action of the Creator, and nothing else. Art is the producing of beautiful results; or perhaps of simply useful results, or perhaps of results which are neither beautiful nor useful.

Next comes science. I began by pointing out that although this is a school of science and art, there is very little connexion between the two things. It does not follow, however, that things which ought to be learned need have any necessary connexion with each other. There is very little connexion between classics and mathematics, yet they ought both to be learned. The real distinction between art and science is that art is uncertain and science is certain,—or ought to be certain. A great many people talk about science, and pretend to arrive at certain results, although they are very uncertain in their knowledge. That is not true science. Science is simply a fine word for knowledge, and knowledge is certainty, or such certainty as is to be achieved. You know, no doubt, that Napoleon Buonaparte was beaten at Waterloo, but most of you would find it very difficult to prove it. That may be called the science of history. Until fifty or sixty years ago electricity was hardly known for any practical purpose. There is a great deal of certain knowledge about it in these days, and a great deal of uncertain knowledge, if I may use the phrase,—that is, a great deal of positive statement, which is no knowledge at all. Some people think they know what electricity is; but a great philosopher,—the greatest philosopher almost of this century,—said, in my hearing, "I have not the least idea what it is." That was Faraday; he said he knew the results, but did not pretend to know what electricity is. But it is the fashion now-a-days for people to be in such a hurry to know everything,—they must be up in the latest theory. They pick up something in the newspapers, and at once talk of it as if it were an accepted truth. They say that there is no doubt that ultimately all force is alike,—gravity is heat, heat is electricity, and everything is everything else. Faraday tried to find it out, but he never got a step towards it. That is the difference between sham and real science. Faraday was really a scientific man, and was not afraid to utter that dread phrase,—"I don't know." What science could do nobody could say, because science was necessarily progressive. Yet people write of what it is certain can be done and what cannot be done. Philosophers proved that steamboats could not go across the Atlantic, and a great many other things, which a few years afterwards were done every day. When people talk confidently about science they should not take things for granted; very often they think they know things which they do not know.

One science is absolutely certain, and only one,—mathematics. There is one infallible rule, and that is the multiplication table. The multiplication table, and the laws of triangles, and things that follow on them, are about the only complete certainties we have. As I have said somewhere else, if a man told me that with dice sixes had been thrown a thousand times running, I should stare at him, and say that the chances against such a thing were millions beyond all calculation; still it might happen. I might tell the person that I very much doubted whether he was not a liar for saying so,—tell him so civilly, of course; but the thing is possible, and therefore I could not positively say he was a liar. But if a man told me that the two sides of a triangle together measured no more than its third side, I should say to that man, "Sir, you are a lunatic. That is only fit for a lunatic asylum. Go there to be believed; don't come and teach it here." So it is with everything connected with mathematics. Linear perspective is mathematics,—there is certainty; and that reminds me that many artists have not the slightest idea about perspective. If a man tells me that his colours are right, I cannot tell him that they are not, not having the knowledge which the artist is supposed to have on that point; but if a person tells me that a drawing which is manifestly out of perspective is in perspective, I say, "Sir, I know you are wrong. You may just as well tell me that four fours are fifteen." Coming to another part of the list of prizes to be presented, I see that free-hand drawing is taught; that is hardly to be called a certain subject, though a near approach to it, and a valuable study. I cannot say much for the painting on china, which is very much talked about at present,—that is "an art." As to chemistry, that is approaching to a certainty, no doubt; but it is only an approximation, and a thing somewhat given to change.

I am sorry to say that I must after all end as I began. I am going to parody a saying of Sydney Smith. He was invited by a nobleman who was not celebrated for hospitality to go and see his house and pictures; he accepted the invitation, and on going to the house was treated with a shabby luncheon. He, however, was shown a lot of fine pictures in gilded frames. When he was about to leave, the host said to him, "Well, I hope you liked it." He replied, "Oh, yes, it is all very fine; but I would rather have seen more *carving* and less gilding." So I would rather have seen more science and less art. We must, however, take things as we find them. It is better to do art than nothing, though I have not a high opinion of it, from its uncertainty and other qualities which I will not recite again. In a letter to me your secretary stated that the art of building is taught in this school. I am very glad to hear it; it is an art that very much wants teaching. A great many errors have crept into it. There is one error with regard to the old builders which I should like to correct. It is said that the builders of old times knew a great deal of science and art. Of art they did know something, but of science little. Art, somehow or other, does not accompany and go along with civilisation, as one might expect. It seems somehow to get squashed by civilisation. People now-a-days are infinitely above savages in knowledge, yet they lack notions of art which some savages possess. Ever so long ago, when I was at college, some weapons made by South Sea Islanders out of stones and sticks used to be shown. When they were examined, the handles of the weapons were found to be decorated rather nicely. In Indian art the work in silver and brass is very beautiful,—beautiful in shape, beautiful in ornamentation, and following Nature in not being too uniform. Take the statuary of Greece, the most famous in the world; they had very little science in those days, nor indeed in the Roman days. At the time the best English buildings were done, down to the fourteenth century, when the work

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manifestly began to deteriorate, there was hardly any science. People think there must have been a tremendous lot of science among the old builders, because they constructed those high towers, stone vaults, and other things of the kind. But I have been behind the scenes, and found that a great deal of that work was done very badly indeed. It is true that they had science enough to make their buildings stand for a number of years, but they were bad builders,—did not know how to make their mortar or how to select their stone. They designed contrary to all rules of mathematics and of mechanics; their buildings began to split and almost to fall down from time to time. St. Alban's Abbey has been a succession of ruins and repairs from the earliest times until now. The state of a great deal of it has been before your eyes in the last three or four years. Therefore you should not run away with the idea that the old builders, by some sort of inspiration or magic, possessed science and art. John de Cellâ [Abbot of St. Alban's from 1195 to 1214] was a bad architect; he did not know how to build and make his work stand, or what sort of mortar he should use. He knew nothing of those things, though he was a good artist as far as mere beauty went. If you have classes for the art of building, I hope the students will be taught how to make mortar, how to make proper abutments for arches to stand against, not allowing large arches to rest against 9-inch walls, as was done in the case of the Abbey. Two or three architects wanted to do the same thing again, and more than two or three,—the whole Institute of Architects,—wanted to do it, and if they hadn't had such an obstinate customer as I was to deal with, they would have succeeded. I like walls like myself. Where John de Cellâ had a wall 9 in. thick, over which he put a great arch and window, I put 9 ft. I do not wish to impose my figures on everybody, but what I have done was the result of mathematical teaching. If any of you are going to begin building begin at the bottom, with a mathematical knowledge of mechanics. Mothers, with sons who can draw "pretty things," put them into architects' offices, there to develop their admirable tastes. A young man of this sort is set to work to copy his master's specifications and drawings; he does that over and over again; the parents pay the architect 300*l.* or 400*l.*; afterwards the young gentleman takes an office, and is an architect; and that I am not.

PARKS AND GARDENS IN LONDON.

It is profitable at times to compare the present of things with the past, and thus to find in detail some elements of that progress of which we hear so much. There are certainly, as there needs must be in so vast a city as London, not a few evidences of this, but none more so than in the yearly, we had almost said daily, increase in the size of it, from north to south, and from east to west. Of new house-building there would seem to be no end, and it would certainly tax the imaginative powers of the most hopeful and dreamy to speculate as to its ultimate future. We have before us a map of Old London, showing the Great Wall of it, and when Graves Inn was out of town, and Spittle Feyldes a garden. This was in A.D. 1593, an almost forgotten date in London history. Our next map is but just half a century old, and it shows Hyde Park and Kensington Gardens, and even the Green Park, field-surrounded, and fairly out of town. The Regent's Park is field-surrounded, and Primrose Hill an isolated mount. Kensington Gardens, with its so quiet and dignified palace, quiet in its seclusion even yet, is now as much in town as is Buckingham Palace Garden itself, and even for a royal palace in these days of progress to be quite sure of a quiet garden, it must needs be at a railroad journey's distance from the huge brick-built city.

It may, indeed, seem strange that this great fact has not attracted somewhat more of public attention than it has done. We have more than once called attention to it as to a growing fact in London's history. Other cities have grown, it is true, and made, in the fact of doing so, no small noise in the world, but none of them quite in the same unnoticed way. A comparison of the London of but half a century back with the London of to-day is sufficiently striking, and there is nought in it more so than the fact of the changes which have taken place in the position, as regards the town, of our great public parks, such as Hyde Park and Kensington Gardens, so noted for its palace and its great trees and the number of them. It would be indeed difficult to divine what the constant dweller in London town would do without the parks. That they are truly the "lungs" of it none will doubt, and that they do their part right well in adding to the healthiness of it is certain. And it thus becomes an anxious matter for inquiry as to what element this is more especially due, whether simply to the wide open spaces, thus affording space for the movement of the air, or to their being grass-covered, or to the number and size of the trees in them, or to the presence of large areas of water, as the Serpentine, in their midst. All these causes probably combine to make of the parks objects of beauty and utility, and sources of health.

But a word or two *in re* Hyde Park. It is a something wonderful that this famous park has existence even, when the rage for "building" is considered, and the opportunity the site of it offered for "building" is taken into account. The history, such as it has been, of this park is curious, though there would seem to be a somewhat good field for research for the antiquary in getting a little more together of its history and first beginnings. Kensington Gardens as they now are, Hyde Park, the Green Park, and St. James's Park would seem at one time to have formed one "manor," as it was termed, and to have been subject to the authority of the abbots of Westminster, and to have formed what was termed the Manor of Westminster. A right goodly domain! But time changes all things, and these three parks, or open spaces, or "woods," as they then were, are now happily public property, and it is for the purpose of reminding at least the artistic portion of the public that this is so, that we call attention to them, and to what is proposed to be done in at least one of them, in Hyde Park. We would, therefore, here state a fact or two not so generally known and kept in view as might be. All, indeed, are interested in the parks, on very many grounds, but our main purpose now is to urge the preservation of the noble trees that are yet left standing, but waiting only, we fear, to follow the fate of the many that have been already cut down within the last few months. Not to be too general, we would name more especially as worth preservation the row of noble trees, of some generations' growth, running east to west, near to the old barrack buildings and storehouse. A glance at a map of the park will show the exact position of them, though, better still, a visit to the spot on which many are yet standing. These trees, many of them, are "hollow," time having dealt in the usual way with them, and they needed, a few of them only, to be protected by a slight iron fencing, thus to protect those that are hollow from further offence and mischief. Much needs yet to be learned of tree growth and death, for it not unfrequently happens that a huge branch or limb of a noble forest tree dies, and eventually falls, while the rest of the tree remains in the full vigour of its life and growth. It is surprising, indeed, to note, even in Hyde Park and Kensington Gardens, and Windsor Forest, and Hampton Court Park, and other places, how vigorous is the growth, and how luxuriant the leafage, of many of the very old trees, and of the quite hollow trees, and where the rising of the sap, or its circulation, must be, one would suppose, totally stopped by the decay of the inner and heart wood or timber of the tree. But it is not so, for the life of the tree and the luxuriance of its leafage are yet there.

There is one item connected with this subject of Hyde Park and its tree growth that may interest and even instruct the scientific. It has been proposed to lessen the number of the trees here and in Kensington Gardens, from the fact of there being too many of them on a given space of ground, and from their growing too closely together, and from their having been too thickly planted. To compare things so wide apart may, it is true, be somewhat venturesome, but we are told by the great traveller,—Humboldt,—that in the forest-tree growth, of which he saw so much in South America and other countries, and where nature does all the work, that the trees grow so thickly that but a very small space is to be found between the separated tree trunks. This, of course, could not be in Hyde Park, but it may well read a useful lesson, and evidence that healthy tree-growth is not injured by the fact of their noble forms growing in thickly-set groups and clusters. Indeed, it would seem to be the very reverse, and that, judging from what nature does in all "neglected spots" of ground, there is advantage in this closeness of vegetable growth. It is a curious and not a little interesting subject, and might be well worth a few trials and a little careful experimenting. It is curious to note in any waste and neglected spot of ground, even in towns, and in their very midst, how close and luxuriant is the growth of the vegetable forms, and how close the tree-growth, should there happen to be clusters or groups of them.

We have ventured to thus call attention to these few facts, in the hope that this important subject of Hyde Park and its tree-growth will receive further consideration before more is done in the doing away with those noble forms of vegetable growth, which it must take generations to replace. We do not venture into details, though it be, indeed, hard to forbear, when so much is done year by year in this special park and Kensington Gardens, which, indeed, forms practically, as things now are, a part of it. That there is much to be done in Hyde Park we do not doubt, but it cannot well consist in cutting down week by week trees of old growth that yet remain in it, or in the further adding to the not a little dangerous and unsightly iron bar, a few inches in height, which line the formal footpaths across it. It is somewhat singular, this last "improvement," and is worth note, and the attention of the Chief Commissioner, for the British public will, in spite of it all, walk on the green grass. Hyde Park but a generation ago was fairly "out of town," and was but a part of the surrounding country; now, at this present date, it is fairly in the very midst of it, and as much surrounded by houses and house-building as the very City itself! Much, as we say, without doubt, remains yet to be thought over and done here, but with kindly nature, not only as worker, but as guide. It is subject of ever-growing interest, if there be one, to the brick-and-mortar-surrounded Londoner.

THE BIRTHPLACE OF VITRUVIUS.

War, which Bentham has well defined as mischief on the largest scale, busily as she has been of late at work, has, within a few short days past, been outstripped in her task of destruction by the action of nature. Since the war telegrams have ceased to detail the destruction of Alexandria and the horrors of the battle-field, perhaps no sadder news has reached England than that which relates the disaster that has overtaken the city of Verona. The rise of the river Adige, swelled by the mountain torrents which have also been wreaking dire mischief over the whole north of Italy and south of Austria, has swept away more than one stout bridge of the classic city, and laid its streets under water to a height that far exceeds any previous inundation. Those who know picturesque Verona will recall how, scattered about the town, the mark will be found on the walls of the height to which the Adige rose in the inundation of 1868. This year, on the 18th ult., the water rose 5 ft. higher than on that memorable occasion, and for days, as the flood retired, the city was three quarters under water.

The accounts that reach us of the destruction done and the misery suffered are indeed sad. To all familiar with the too general poverty of the modern inhabitants of the once wealthy Italian cities of Venetia, the position of the Veronese can be only too well understood. It is the poorer portions of the city that, of course, have suffered the most severely, but even the stouter work of the past has been injured. The solid Ponte Nuovo has been entirely swept away, and Fra Giocondo's famous Ponte delle Navi, after three centuries of sturdy resistance to the swirling Adige, has been so severely shaken by the floods as to be in imminent danger of requiring demolition. Verona, writes a local paper, is in great part destroyed, and the damage done amounts to millions of francs. No words can express the awful disaster that has overtaken the city, writes the *Nuova Arena*. On the river itself, in addition to the entire destruction of the Ponte Nuovo and the wreck of the Ponte delle Navi, the new iron Ponte Aleardi, which was commenced only two or three years since, has been almost destroyed; the Ponte Garibaldi, another iron bridge, has been seriously injured. The picturesque old sulphur-mills on the river were,

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of course, among the first to be swept away, and, dashed against the bridges, only served to add to the terrible force of the waters. In the midst of the sweeping destruction, the Mediæval quaintly-crenellated bridge of the Castel Vecchio, still remains standing, as also the old Ponte Pietra, a Roman work, having thus resisted one more of many attacks during its venerable existence.

Divided as the city is in two by the river, it can be understood what damage has been done by the flood. There exists no quay, the houses being built on, in many cases actually overhanging, the river, which sweeps and swirls romantically under long lines of dark arcades and arches.

Every one knows how enthusiastically Mr. Ruskin has spoken of Verona, one of those almost flawless gifts which the Middle Ages have handed down to our prosaic present. As yet no desecrating tramway has invaded the narrow bustling streets of Verona, as is the case in almost every other Italian city of any importance. Overshadowed by innumerable balconies,—for Verona is the true city of Romeo and Juliet, though Shakspeare can never have visited it,—the busy streets seem to have retained in their twilight the living spirit of the day which so many a quaint doorway and architectural detail recalls at almost every step. Classic remains meet one at every turn, to speak of the great citizens of Verona, of whom she is so justly proud, Cornelius Nepos and Pliny, and, above all, that early master of architectural learning, Vitruvius. As the birthplace of Vitruvius alone, apart from the memory of Paul Veronese and San Micheli, Verona holds a hallowed place in the history of art.

Pleasant, delightful city, now so sadly devastated, we can well understand how, two hundred years ago, John Evelyn, when he visited Verona, jotted down in his diary (1646), "Here of all places I have seen in Italy would I fix a residence." The home of the classic recollections which appealed to him, the home of the Mediæval memories of Dante and his protectors the art-loving Scaligers, of all the interest of the Renaissance architects, painters, and sculptors which we attach to the story of Verona, the sad calamity which has overtaken the city may indeed appeal warmly for sympathy from the whole artistic world. We hear a great deal in the present day concerning the destruction caused by restoration, but the destruction worked by the hand of man is paltry compared with the work which Nature is able to perform where her action is left unchecked.

There will, we suppose, be some inquiry immediately made by competent engineers as to the causes of the recent floods in Northern Italy, and means will be devised to prevent the possibility of the recurrence of such disasters. That measures are capable of being taken, and that the danger of the mountain torrents has at all times been understood, may be shown by the great engineering works which, as far back as the sixteenth century, the Veronese architect, Fra Giocondo, planned and carried out in the neighbourhood of Treviso, with a view to protecting that city and the flat plain stretching down to Venice from the possibility of inundation, works which, it may be mentioned, remain to this day as serviceable as when they were first erected.

But the good old architect's bridge at Verona has, as we have said, now been severely shaken. Fra Giocondo's reputation as a bridge-builder was great in the sixteenth century. He was employed at Paris to build the Pont Notre Dame, which only succumbed to modern requirements. The modern requirements of the Veronese have, however, found their worthy citizen's bridge ample for their purpose for three centuries past, and Verona, if it loses the Ponte delle Navi, will have lost one of its most characteristic features. Otherwise there is ground for congratulation that the city of the Scaligers will not have suffered much artistic loss from the recent floods. The chief works which give it in architectural history so important a place, the Church of San Zeno, the Duomo, San Fermo, and St. Anastasio, the tombs of the Scaligers, the huge Arena, the picturesque Piazza delle Erbe and the Roman gateways, the picturesque fortifications, the innumerable Mediæval and Renaissance *palazzi* scattered about the streets, will remain still to delight the traveller to smiling Italy.

But before all is again set to rights there must be much suffering in Verona. The poorer portions of the population will have been the most tried, and though perhaps, from a sanitary point of view, there may be small grounds for regret that many sections of the city will have to be rebuilt, yet the funds that will be required to carry out the work will be sadly wanting.

EDINBURGH.

Upon returning to the city after the summer holidays, we feel some curiosity and anticipate considerable pleasure in making a survey of the different building operations which were in progress when we left. The result, however, is generally somewhat disappointing, for we invariably expect more to have been done during the month or two of our absence than is actually achieved.

Our steps are, in the first instance, by a natural impulse, directed towards Princes-street, and nowhere else do we find a more picturesque and charming urban scene, one where nature and art combine more effectively. Proceeding westward, we observe that the Conservative Club is gradually asserting itself, and remark the careful attention to every detail given by Mr. Anderson, even to the size and joining of the masonry, a matter which is too often left to the discretion of the builder, but which, if judiciously controlled, gives a distinctive expression to the construction. The masonwork of the new chancel and porch of St. John's is completed, and the detail we observe is almost a repetition of that in the original building. One departure, however, consists in the arching of the long windows, which embrace both aisle and clearstory, in which the use of the four-centred arch has not been adhered to; the tracery, too, is slightly varied. We cannot say that we admire the depressed battlemented gable of the porch; a little more freedom might have been used without the additions being out of keeping, and the original structure is not of much account as regards style.

We find that a new south front is being put up to St. Thomas's Chapel. The principal façade is towards the north, and abuts upon Rutland-place. It is a tame modern version of Norman style carried up in two false gables, against one of which is a semicircular projection containing stair to galleries. The south elevation towards Rutland-street was carried out in unison with the plan of that street, in a plain Domestic style, with square-headed windows, cornice, and balustrade. The opposite side of the street was removed several years ago to make way for the new Caledonian Railway Station, and an open place formed, which left the side of the chapel more exposed to observation than before. The new elevation shows two stories of semicircular-headed windows, divided into two lights by shafts, those in the upper tier having a circular pierced opening at the apex. There is a small doorway which has been brought into unison with the rest.

The centreing for the new west door to St. Giles's Cathedral is in place, but, at the present rate of progress, it will be some time before it is completed. We find the chancel still in the hands of the workmen, but are given to understand that it will be opened for public worship in a few weeks hence. The scaffolding of the spire of new West St. Giles's Church has just been removed; it tapers up gracefully over the trees of the Meadow Park. The interior is in a state of chaos, but, so far as observation permits, it appears to be constructed in a thorough manner. The architects, Messrs. Hay & Hardy, have adopted a Scottish peculiarity in using the semicircular arch in the windows of aisle and nave, the general character of the design being of the Flamboyant style, this arch having been used in Scotland in conjunction with the pointed arch throughout all the different phases of Gothic architecture.

The stonework of the new Board School for this district, situated at the junction of Marchmount-crescent and Marchmount-road, is almost complete. The site consists of an acute irregular triangle, and irregularity of plan was a necessity which might have been taken greater advantage of than has been done in regard to grouping of parts; as it is, the building is tame and uninteresting, the new tenements built and in progress beside it having much more spirit in them. The variety and character of the elevations of these new tenements are certainly remarkable, comprising gables, oriels, dormers, and angle turrets, each builder emulating his neighbour in producing something different. The effect is striking, and would be more so if the buildings were not all of a uniform height; but this is most probably regulated by the conditions of the feu charter.

At Watson's College, to the north of the Meadows, an addition to the west of the existing building is being carried out under the supervision of Messrs. Macgibbon & Ross. The additions will partake of the same Classical character as the rest of the building, and will be about 30 ft. long with a depth of 55 ft. The ground-floor is to be utilised as a gymnasium, the second floor is to be appropriated to schoolrooms, and the third or uppermost floor is to form one large class-room for drawing, &c. The two upper floors will communicate with the corridors of the existing building. These additions have been rendered necessary by the great success of the school, which is under the care of the Merchant Company, the number of applicants for admission to this and the other schools governed by the company being greatly in excess of the accommodation.

The new Chalmers Territorial Church, at the West Port, begins to show over the enclosing hoarding, and the Newforth United Presbyterian Church is in a similar stage of progress.

At the north-west margin of the grounds of Greenhill, recently acquired by the Messrs. Beattie at a cost of about 4,400*l.* per acre, building operations have commenced. The designs for these works have been prepared by Mr. Hippolyte J. Blanc, and comprise three blocks, each having a frontage of 100 ft. and a height of five stories. The main doors are expressed by projecting porches, having moulded architrave, frieze, and pediment; Venetian windows and oriels alternate, the former having a projection of 4 ft., with three lights in front, and narrow ones at the sides; these are carried up two stories, and the oriels, which are set on a projection of 2 ft. 6 in., rise to the main line of the eaves. The sky-line is diversified by Mansard roofs, double and single pedimented dormers, and large gables with ogee curves, in which are placed square-headed windows between fluted pilasters. From this description it will appear that there is a departure from the common-place builder's plan, and that the aim has been to secure a pleasing variety in outline and detail. Equal attention has been given to the internal arrangements, where the sanitary provisions are to be of the best description. Another departure from the usual plan is that the ground behind each block is to form one area instead of being divided into narrow plots by party-walls.

The new Established Church at St. John's-street, is now completed, and it is satisfactory to be able to report that the interior is more seemly than the exterior, which is positively ugly. Everything within, it is true, is plain, but the proportions are good, and the arrangements well suited for an auditorium; everything seems thorough, and there is none of the pretentious plaster work too often indulged in.

Pretentiousness of the most rampant description appears in the Colston-street United Presbyterian Church. You approach an imposing front with a large doorway and great traceried windows, and turning the corner observe a small oblong conventicle, hidden, or rather meant to be hidden, behind the grand frontage.

The Guthrie Memorial Church is not so pretentious, but it is an unsatisfactory specimen of the Nonconformist Gothic type, with cast-iron columns and wooden clearstory. It unfortunately is placed beside a beautiful little Episcopal church, which it swamps, but an addition is being made to the latter, which may counteract this.

By the will of the late Captain Hugh Reid, a sum of 1,000*l.* was placed in the bank at the credit of the Edinburgh Town Council, to accumulate for twenty-five years, as a fund to assist in the erection of a memorial to the Scottish heroes, Bruce and Wallace. It was suggested that the monument should be in the form of "an ornamental piece of water in the Nor Loch, with a fountain in the centre, and colossal statues in bronze of each hero in conference." The stipulated twenty-five years having expired, the Corporation invited an open competition, stipulating that the cost of the completed design should not exceed 2,000*l.*, and offering premiums of 30*l.* and 15*l.* to the designers of the works which might be con-

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sidered second and third in merit respectively. The models to be 3 ft. in height, and the treatment of the design and suggestion as to site to be at the discretion of the competitors. The completed figures to be not less than 12 ft. in height. Seven sets of models have been sent in, as we have already stated, and they mostly represent the warriors clad in mail, Bruce with his battle-axe and Wallace with his great two-handed sword. The designs have been inspected by a committee of the Town Council, but as yet no decision has been arrived at.

By a new arrangement the Corporation has undertaken the supervision of the sanitary arrangements in each house within their jurisdiction. Any citizen having a suspicion that his drains are not in good working order, may give notice to the burgh engineer, who will thereupon send a competent inspector to examine the house, and thereupon a report, containing a statement of the deficiencies and proper remedy, will be furnished.

A proposal was made at the Council Board that the vacant space at the east end of the School of Arts in Chambers-street should be filled with a semicircular recess, as intended by Mr. Cousins, the architect of the street; but this proposal was objected to, as it appeared that the ground might be required for an addition to the School of Arts. The ground in question is very shallow, and it was intended that a screen wall should be erected to shut off the view of a workshop, the recess towards the street being left for a fountain or monument of some sort.

The City Treasurer, in his report, states that there is a remarkable coincidence between the actual expenditure of last year, and the estimated expenditure of the current year. The actual expenditure of last year was 144,335*l.* 5s. 11½d., and the estimated expenditure of the current year was 144,335*l.* The respective items differed widely, but the fact that the totals were so very near was one of those curious things which happen now and then. The estimate for carrying out the Improvement Act for the current year is 20,000*l.*, which is equivalent to a rate of 3½d. per pound on the rental.

CHENIES.

One of the consequences of the feverish life of the present day is the natural tendency of society to seek holiday pleasures in hurried travel, among great cities, in crowded centres, and in the grand scenery of the Alps. English landscapes are apt to be too tame and too wanting in the excitement which has become so necessary a part of modern life to have attractions for more than a few quiet and moderate people. Yet, in some of the least frequented and yet most accessible parts of England, within comparatively a few miles of London, is to be found scenery which is full of charms, and of a quiet and unique beauty which can be seen nowhere else. Among the hills and woods of Hertfordshire there are scenes of woodland beauty not to be surpassed in England. The western borders of this county, and that part of Buckinghamshire which lies to the east of the Great Western Railway, and is bounded by the little river Chess, have a beauty peculiarly their own. The heavier woods of the eastern part of Hertfordshire are lightened by the greater variety of trees,—oaks and beeches and firs grow side by side in the same wood. The streams winding through the ".bottoms" give a brightness to the view, and the cornfields and brown-roofed farms bring a warmth and homeliness to the uplands, which are made more distinctive in character by the numerous cherry orchards. It is quite in this pleasant country that one walking northward from Rickmansworth finds the village of Chenies. No spot could better fulfil the idea of a typical English village, whose neat and comfortable cottages are surrounded by gardens bright in summer with phloxes and carnations. The wooded hills and valleys of Buckinghamshire disappear to the west, and on the other side the valley of the Chess sweeps in steep slopes and with a graceful curve, beautiful with woods and cornfields and hedges burdened with the traveller's joy. Past the great clump of elms which shades the end of the village, and the avenue which leads to Sarratt Bottom, and on the brow of the hill, is the old manor-house of the Cheynes. It carries us back for more than three centuries, dating, in its present form, from the reign of Henry VIII., when the first Earl of Bedford, who had married the heiress of the Sapcotes, the owner of the manor, changed the old house which had been the home of the Cheynes, predecessors of his wife's family, into the Tudor mansion which we now see. It has been well preserved against the ravages of time, and though it now is inhabited both as a farm and cottages, yet its mellow red walls and chimneys rising from among the dark ivy, and forming two sides of a triangle, its sunny terrace and bright garden, and the dark shadows of the angled front, give it the beauty without the painfulness of age. Standing alone it would be architecturally interesting, but forming a part of a picturesque village itself, in harmony with the country round, it helps to make Chenies a singularly delightful place. But it is when we cross the road and enter the church that the perfect uniqueness of this Buckinghamshire hamlet is really understood. A quiet country church has always attractions which have never been so fully expressed as in Gray's incomparable Elegy, but the church of Chenies brings into focus a long period of English history. On the northern side of the church is the vault of the Russell family, and above is the chapel in which the monuments, the tablets, and the banners tell of three centuries of an historic family. Chenies possesses the only church in England which is so completely the tomb of one single race, and a race which has entwined itself so well with the best features of our history. We take no note of the Cheyne family, but we find Russell after Russell buried beneath our feet. They begin with that Sir John Russell who became the first Earl of Bedford, a Privy Councillor of Henry VIII., Lord High Admiral to Edward VI., and Lord Privy Seal to his sister Mary. Among them is a well-known historical figure, that Lord William Russell, one of the victims of the Rye House plot; among them also lies the great Whig statesman of our own century. But each generation has brought forth some man who has done good service to his country, though the political position which he has occupied has not been so high as to cause him to be an historical figure; but men and women, generation after generation, they were brought for burial to this Buckinghamshire churchyard. The mere fact that these men lie here is, perhaps, the most enduring and the most striking monument they could wish, and the small black marble slabs are more telling than the more elaborate monuments which are also to be seen in this chapel. In fact, the great structure which occupies the west side of the chapel in which William, the first duke, and his duchess are seated in full court dress, with medallions of their children round, in the florid and disagreeable taste which marks English monuments of the seventeenth and eighteenth centuries, seems wholly out of place. That which artistically is most attractive is the fine alabaster monument which represents the first earl and his wife laid recumbent side by side. The figures are of life-size, and the work is characteristic of the period and of the style of which Torrigiano was the chief master in this country. The most barren spot filled with these memories would be full of interest, but when to them is added the picturesqueness of a pretty English village, the charms of a singularly attractive county, and the mellow beauty of the old manor-house, the epithet which we have applied to Chenies that it is a "unique" village is obviously no more than the truth. It may, indeed, be almost called the most remarkable village in England. Fortunately it is not likely to lose its quiet charms, which agree so well with the last resting-place of a great political house. The railway is at a distance, and, amongst strangers, it is chiefly the trout fisher who has been fortunate enough to obtain a day on the Chess who most frequents Chenies.

Liquidations in the West.—Builders in the neighbourhood of Exeter seem rather "shaky" just now. Within the last few days the failures have been announced of Mr. Thomas Redway, builder, of Exmouth (Mr. Redway is the partner with Mr. Moass for building Sir Henry Peek's mansion at Rousdon, under Messrs. Ernest George & Peto, architects); of Robert Davis, of Newton Abbot and Exeter, builder (this bankrupt is stated to have absconded); and of Frederick W. Vanstone, builder, of Torquay.

HEALTHY HOUSES AND HOW TO SECURE THEM.

Prof. Henry Robinson, C.E., in his address as president of the Engineering and Architectural Section of the Newcastle Health Congress, said:—Engineers and architects may agree on right principles, and may devise skilful means for carrying them out, but their field of labour will depend entirely on the appreciation by the masses of the requirements of health. There is less difficulty in getting people to see the necessity for new roads or railways, and to find the money for them, than to find the money to make their homes healthy. Referring to house sanitation, he said it is no exaggeration to state that not one quarter of the dwellings of all classes, high or low, rich or poor, are free from dangers to health due to defects with respect to drainage, water, or ventilation which were capable of being easily avoided at the outset. The public are now more alive than they were to the necessity for inquiry into these matters, and consequently sanitary authorities (who cannot go much ahead of public opinion) are better able to enforce regulations, and are more willing to bear the expense of doing so. To ensure healthy homes, local authorities should have by-laws requiring compliance with general rules, which are now well known and hardly require to be specified. It is obvious that the condition of the drains, soil-pipes, ventilation, &c., of the old houses should also be the subject of investigation. But it is not till the attention of the Medical Officer of Health is arrested by the occurrence of fever, or other form of illness, that their condition is inquired into at all, although they might have been in so unsanitary a state as to be unfit for habitation. The conversion of unhealthy old dwellings (which form so large a proportion of the houses in large towns in this country) into healthy ones is a task which, without reference to by-laws, presents no attractions from an architectural point of view, but has nevertheless to be undertaken by those who are best fitted, from their position and influence, to deal with the subject. These observations apply with the greatest force to the houses of the poorer classes, who have not the opportunities of exercising any critical supervision of their own. As regards the houses of the better classes, the same remarks apply to a greater extent than should be the case, considering the irretrievable mischief consequent on treating these matters apathetically. In order to direct attention to the condition of houses, and to expose their unhealthy state, the following plan is suggested: It should be compulsory on the part of medical men, or of the occupier, after notification by the medical man, to return to the Officer of Health for the district any case of illness of the classes agreed on as arising from sewer gas, infected water, and the like. This notice should be accompanied by particulars of the house in which the illness occurred, and whether it was an imported case or originated in the house. It should then be the duty of the Sanitary Authority to have affixed to a plan of the district a coloured wafer or dot corresponding with each disease. This plan should be open to public inspection, as well as any reports explanatory of each case. The effect of this would be that a house, or group of houses, in which filth-diseases occurred would be revealed at once to the eye of an intending occupier by the array of wafers, warning the unwary against the danger they are running. This suggested registration of disease by maps appears to be in operation in Newcastle. In the *Lancet* of the 16th of September, it is stated that a map "records, by dots of different colours, all the cases of scarlet fever, enteric fever, typhus, small-pox, and whooping-cough, according to the locality in which they are reported." It is further stated that all such cases are voluntarily notified to the officer of health. Dr. Armstrong deserves well of all sanitarians for having introduced this system. A means of compelling inquiry into fatal cases of typhoid and enteric fevers, and similar diseases arising from preventible causes, would be to require an inquest to be held, at which evidence would be elicited which would point to the cause of the disease, and the necessary steps to remedy the mischief would follow. On the efficient way in which the plumbing and sanitary work in a house is executed depends, to a large extent, whether a house is healthy or not. Experience proves continually that much of this work is done by incompetent or careless people, and

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requires subsequent rectification, probably after illness has caused an investigation to be made. In America, legislation has aimed at correcting this evil by making it a penal offence for plumbing work to be badly carried out. He contended that an intending purchaser or occupier of a house should require a certificate that certain stipulated conditions have been fulfilled. This would render it necessary for the landlord or vendor to ascertain (what is only equitable that he should) that the house is fit for habitation before he derives any benefit from his property in it. Similar certificates should be required for all new houses, and no one should be allowed to let or sell a new house until the local authority had given a certificate. This would involve more inspection and a larger staff than now exists, but the cost of this might fairly be borne chiefly by the builders, who should pay according to a sliding scale.

"INDUSTRIAL DWELLINGS" FROM A SANITARY POINT OF VIEW.

This was the subject of a paper read by Mr. John Price in the section devoted to Engineering and Architecture at the Newcastle Sanitary Congress. Mr. Price, as resident agent of the Newcastle Industrial Dwellings Company, says, —Twelve years' continuous residence in a block of industrial dwellings, and thirty years' intimate association with the working classes, enable me to speak practically as to their opinions and requirements, and that as great a diversity of views exist amongst them on sanitary matters as amongst any other section of the community. Some have great regard for their own health and that of their family; others treat this important subject with ignorant contempt. The low death-rate exhibited by blocks of industrial dwellings in contrast to the surrounding neighbourhood is a striking proof of their healthiness. The London Improved Industrial Dwellings Company, which now provide accommodation for about 20,000 persons, shows an average death-rate of 16·4 in the 1,000 for the year 1881, against 21·2 in the metropolis generally during the same period. The dwellings of the Peabody Trust exhibit an average death-rate of 17·22 during the same year. The Metropolitan Association record an average death-rate of 14·3 in the 1,000, whilst the block belonging to the Newcastle Improved Industrial Dwellings only show an average death-rate of 12 in the 1,000 for the year ending 30th June, 1882, which is more satisfactory when it is remembered that the majority of the tenants belong to the worst paid section of the labouring classes. This may be considered a striking testimony of their value from a sanitary point of view, apart from all other considerations. The evidence given before the recent Parliamentary Committee shows that the problem of how to provide the lowest class of the poor with healthy dwellings has not yet been satisfactorily settled. The poor in many cases have been driven from their homes, and excellent dwellings erected on the sites, but at rents much beyond the means of the poor. Companies having heavy charges on their revenue naturally make a satisfactory return one of their first considerations. The poor can only expect relief from philanthropic aid in the matter of better dwellings. Industrial dwellings, to be successful, must be placed in convenient situations, and possess essential sanitary requirements. The working man, both in London and in the country, strongly objects to travel far from his home to his work, and will sacrifice many advantages for this one great privilege. Industrial dwellings should not be too lofty for the tenants, should be spacious, well ventiiated, and have a plentiful supply of pure water. The stairs and landings should be of fire-proof construction, the steps easy to ascend. Water-closets, which should be situated in an offshoot from the main building, should be of the simplest construction and well ventilated, a simple metal or earthenware pan, with feed-pipe flushing-rim and plug, the most serviceable for large buildings. These should be under the sole control of an attendant, who should inspect these places, as well as the sinks and drains, daily, to prevent the stopping up, which so often occurs when left to the tenants, especially when these conveniences are used by more than one family. The prejudice which existed against the first-built block of model dwellings is now dying away. Handsome buildings built to suit the requirements of the working-classes are now to be found in London and elsewhere. The dwellings belonging to the Newcastle Improved Industrial Dwellings Company, though a comparatively small block, have shown excellent result,—the death-rate only averaging twelve in the 1,000 for the year ending 30th June, 1882. The buildings are now fully occupied, the majority of the tenants being labourers on the Quayside and surrounding neighbourhood. The operations of the company have in many ways been productive of benefit to the neighbourhood, and limited capital alone prevents their doing still more. Much regret has been expressed that the Corporation of this city has hitherto done but little to assist this movement.

In the discussion that ensued, Captain Galton said that the question before them was becoming in our town populations one of absorbing interest. The price of land was, no doubt, one of the greatest difficulties. Of course it was possible to erect dwellings outside towns, but there was an early limit to that, because a very large number of the class of population for which they were intended must live close to their work. It was there where land was the most costly, and therefore he would commend to the attention of town authorities the importance of assisting private enterprisers willing to devote themselves to making improved industrial dwellings.

Mr. S. Alcock said that this was one of the most important questions that could come before them, and he thought after all they could only look upon industrial dwellings companies as pioneers of the way in which these dwellings ought to be provided. Unless it could be shown that these companies could provide dwellings which would give remuneration for the capital persons invested in them, what they would be able to do would be infinitesimal; they would not succeed really in providing for the wants of the working classes generally. So far as Sunderland was concerned, they had very advantageous dwellings for the working classes, consisting of cottages of one story, self-contained, and having three or four rooms, at a rent of 4s. or 5s. per week.

Alderman Cail said that in Newcastle and Gateshead there was a class of houses very valuable to the working classes. The buildings were two stories high, and each story was a self-contained house, with distinct outlets, yards, and conveniences. These houses were being built to an immense extent, and he thought they would meet the wants of the working classes in the best manner possible.

THE SCOPE AND INFLUENCE OF ART.

Mr. George Aitchison, A.R.A., as president of the Art Department of the Social Science Congress at Nottingham, concluded his opening address with the following words:—It is the true nobility of nature that pervades our race, that makes the very highest literature equally admired by the Queen on the throne by the poorest peasant, "One touch of nature makes the whole world kin." Horace's maxim that if you want your hearers to weep you must weep yourself is true of every art; it is the intense feeling of a passionate nature expressed by the subtlety of skill that makes all true and noble art:—

> "'Twas partly love, and partly fear,
> And partly 'twas a bashful art,
> That I might rather feel than see
> The swelling of her heart."

In painting, this master-chord of nature is sometimes touched, and then, though the beholder may be ignorant of the technical merits of painting, he is forcibly impressed. No one ever looked at Francia's Madonna mourning over the dead Christ, in the National Gallery, without tears coming into his eyes. Sir Edwin Landseer knew, loved, and honoured dogs, and his "Chief Mourner" is one of the most popular pictures of modern times, not in England alone, but amongst all civilised nations. You may see engravings of it in the shops of every capital in Europe; but, as a rule, both in painting and sculpture, we must look upon anything that is the mere petrifying of a momentary emotion or movement, as nothing but a feat of skill: beauty and calmness, dignity and composition, are much higher and more proper qualities, as the same action or the same expression is ever with us. The great Italian painters, when they painted a martyrdom, avoided the physical agony and dwelt on the seraphic calm and resignation of the saint, who was already tasting the delights of Paradise. We look for gorgeousness and exquisiteness of colour in painting as its peculiar attribute, and we also look for perfection of form and grace, and subtlety of composition in sculpture and painting. If we want the expression of passion and violent action we look for it in the drama. When we deal with genius in one line of achievement we may perhaps make an approximate scale, but we have no means of comparing different classes of genius with one another. To discover a natural law or the application of one, to invent a machine, to solve a great engineering problem, may require as much genius as to paint a picture or carve a statue, to write a poem, or to compose an oratorio; so I shall not attempt to exalt the great architects above the great men in the other fine arts, but, at any rate, I know more about the difficulties of architecture than about those of any other fine art. A building has to be made convenient for its purpose, and to be securely built,—both difficult arts, though perhaps not fine arts. It must be imposing, dignified, or graceful, before we admit it to be architectural, and yet the difficulties may be almost insuperable; to take a high rank, it must plainly declare its object; it must, at all events, not be mistaken for a class to which it does not belong, and, moreover, it must be in accordance with the tastes of the age. But what if the age have no taste, and only asks for a brick wall with holes in it, what is to be done then? You may point to many a fine front as a contradiction, but be sure that, however fine that front may be, if there be a back that only the owner sees it is a plain brick wall with holes in it. If it were done for the owner's delight he would be more anxious for the part he sees to be beautiful than the part he rarely or never sees. I was once at a doctor's before his last patient was done with, and the doctor was impressing on him the advantages of cleanliness, and finished up by saying, "And be sure you wear a clean shirt." Thinking the patient's shirt was as clean as my own, I said, as soon as I was alone with the doctor, "You are rather emphatic about a spotless shirt"; but the doctor said that it was only a "front,"—that the man must have worn his shirt for six months, it was as black as the back of the chimney. So you see that though the patient was desirous of being thought clean, he did not care for cleanliness himself. A real love for anything is the beginning of culture, and is a stimulus to the creative artist; but a pretended love is merely a blighting curse; to love plainness is the honest confession of insensibility; to love dignified or elegant simplicity is to love the very highest form of art. I would fain see every man having his own house built to meet his own requirements, both of arrangement and beauty, and not living like a soldier-crab in the left-off shell of some one else. And that he should at least have something put on it that is interesting to him, and have this done by a good sculptor, or a good painter, an episode of his life, a family tradition, or something natural that he loves, be it but a dog, a cat, a sparrow, or a flower. There is one thing we may all desire, and which applies, not only to architecture, but to all the fine arts, viz.,—to have art-schools in all the large towns,—not drawing-schools only, but the art itself, flavoured by the genius of the place. As the French sometimes say in praise of one of their wines, "It has a smack of its native soil." We do not want everything to have the London flavour. In Italy, we have the Tuscan, Umbrian, Venetian, Lombard, and Bolognese schools,—nay, even Florentine and Siennese schools,—and why should we not have the schools of Nottingham and Liverpool, York and Manchester? Separate schools would cause a generous rivalry, which would not be without its effect. There are two theories of government at each end of the scale, one in which government does everything and possesses everything, down to the penny steamboats and the apple-stalls; the other, which confines it to external and internal police and the enforcement of contracts; and I think, as a rule, our prayer should be that of the French merchants, "Let us alone." Still there are certain things to be done and certain contributions to be made by all for the good of all, and this the Government alone can enforce. Every Government should at least desire to have the people free, virtuous and healthy, courageous, industrious, and happy. Doubtless the way of obtaining these six desirable conditions is being shown in

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the other sections, but we want more; we want every one of our people to be raised by the exercise and enjoyment of all his higher faculties, and for the sake of the nation we want all our human raw material to be worked up. When we use the word "free" as applied to costly things, we know that nothing is free but light and air, and few of us can get our due allowance of these; what we mean is, that they must be bought by national co-operation, every man paying his quota, and every one getting his full enjoyment. So I say we want free parks and gardens, free lending and reference libraries, free picture-galleries and museums, and,—I suppose the musician will say,—free music. And that these may be used and enjoyed by the bulk of the nation they must be open on the one day in the week when the people are free from toil. You may open all our national churches from sunrise to sunset the six days they are now shut. I, for one, rather envy the Moslem and the Roman Catholic their freedom to enter their churches and mosques when they like, and to pray if they please, while we poor Protestants can only do so for a few hours on Sunday. I would add fine contemporary buildings and monuments enriched by the sculptor and painter. Such things stimulate emulation more than any number of triumphs of by-gone days, and can be seen Sundays and week-days alike. The Government does something for architecture when it picks out the best architect for a public building, and it did something once for painting and sculpture when it had the frescoes and statues at the Houses of Parliament executed; but, as far as I know, it has never done anything for poetry, for music, or for the drama. It must be a great incentive to excellence to have a poem declaimed, an oratorio played, or a drama acted before the assembled people, and with all the excellence and appropriate surroundings that a nation only can afford. We have colonies and dependencies in Asia, Africa, America, and Australia, and nothing is more wanted than a means by which all these branches of the English race may be knit together. Our one national holiday is the Derby Day, devoted to horses alone. Is it too much to suppose that we might have combined with it for one week, and with the betting-ring suppressed, a festival to celebrate the highest achievements of men? If the ancient Greeks could do it, why could not the England of to-day?

FILLING THE PORES OF WOOD.

Stained or painted woodwork is finally submitted to the various treatments known as polishing, rubbing (with wax), or lacquering or japanning. Those processes are intended, on the one hand, to beautify the work or to give lustre to it, and, on the other, to protect its surface against exterior injurious influences, consequently to impart to it greater durability. By closing the pores of the wood it becomes smoother, and is capable of greater resistance. Very much depends upon an efficient closure of the pores, also upon the operation being effected with the proper substances. The latter should harden within a few hours, and should not undergo any changes from exterior influences during their transformation which might have injurious effects upon the layer of polish, lacquer, or wax. Although in recent times means have been placed at the disposal of the workman which meet all these evils, in nearly every one of our joinery and cabinet-making shops the old method of filling the pores,—smoothing or polishing with linseed oil and pumice-stone,—is still practised. Our joiners and cabinetmakers of the old school will have nothing to do with newer methods, because their shops are worked on the old system of smoothing with oil; it is said that the wood becomes brighter through the oil entering it, and the system permits them to dispense with the more elaborate treatment with plane, scraper, glass-paper, and Dutch rush, which is indispensable in the methods of filling the pores, as described below, and which we copy from an article on the subject in the *Deutsche Tischler-Zeitung*.

The writer of the paper, Herr L. E. Andés, of Vienna, admits that as regards the polish of the obtained surface, smoothing with oil has the advantage. On the other hand, it is a well-known fact that work thus prepared loses in appearance in a very short time by the sweating of the oil. The outside smooth surface becomes rough and dead, loses its polish, the percolating, not yet dried, and consequently still sticky oil absorbs dust, and the furniture, &c., loses in colour, and a repetition of the polishing process becomes necessary. As a matter of fact, the sweating of the oil cannot be prevented by this method, for the fine particles of pumice-stone which, mixed with the oil, fill up the pores of the wood, retain the fat substance. The wood itself has eagerly absorbed all the oil, its cells are deeply filled with it; and when the linseed oil, if exposed to the influence of the air, dries only after six to eight days, it is quite out of the question to speak of a solidification of the whole. Now, it is generally the custom to begin with polishing directly after smoothing. Thus we apply the polish upon a surface not yet dry, polish it, and only then, when this latter operation is completed, we give to the oil, which now is no longer in contact with the air, an opportunity for drying, by standing in a warm room, &c.; but in course of time, the oil below the layer of shellac begins to dry up without exposure to heat; the shellac layer is torn into numerous fine cracks and turns rough, while at the same time the fine particles of pumice-stone are beginning to come out. The still sticky oil absorbs all dust, the pumice-stone particles become more prominent, and we have, as the result, instead of the desired shining surface which should remain smooth, a rough, dirty crust, which disfigures our furniture.

The durability of the lustre and the smooth surface can be guaranteed only if the wood, after smoothing with oil, is left for six months before being polished. By that time the putty formed of the pumice-stone and linseed oil is perfectly dried up, and the polish then applied is lasting, and the sweating of the oil prevented. But as, under present conditions, it is almost impossible to let work stand so long, it is highly desirable that means should be found by which we might be able to dispense with oil altogether. Herr Louis Köhler, of Giessen, suggests the following method:—"Polishing is still the same operation that it was 100 years ago. The polish has also remained the same, without essential improvement. And yet the whole process is very faulty and imperfect, and as long as it is pursued, the exudation of the oil and the deadening of the best work cannot be avoided. If no oil is to sweat out of the wood, none must be put in; the latter, however, is done on a large scale with the old procedure, consequently the work is spoiled. Now, instead of smoothing the wood with oil and pumice-stone, it is only necessary, after the piece of work is completely finished, to put on the lacquer with a so-called badger brush. This is done quickly because the lacquer (a spirit lac) dries at once. Successive coats of lac are applied until a so-called ground is obtained. Porous woods, of course, require more lacquering than close-grained kinds. If the work is well performed, the whole is now smoothed with fine pumice stone, rotten stone, or hartshorn. The polishing is proceeded with, but without oil, only a little of the latter being used for finishing."

This procedure effects one thing. The pores are completely sealed up with shellac, and as no oil can enter, none can exude in course of time. Spirit lac, however, is expensive, and we must therefore try to employ other materials which close the pores of wood by a simple and cheap process. This may be attained by sizing with glue-water, by coating with starch-paste, or by filling the pores of the wood by the American method, with "wood-filler." By either of the three methods the pores of the wood are completely filled, and as no oil enters the wood, none can come out afterwards. Sizing with glue-water is almost exclusively employed for soft woods, the size being applied three or four times with a brush. After drying, raised fibres of the wood are rubbed off with fine glass-paper, and polishing or japanning is proceeded with in the usual manner. Coating with starch-paste is much more advantageous than sizing, starch once dried being perfectly impervious to exterior influences. A moderately thick paste is prepared by pouring and stirring in boiling water a dough made of powdered starch and cold water. The wood is coated as required with a brush, and then treated as usual.

The most perfect process of filling the pores of wood has come to us from America. At the Philadelphia Exhibition of 1876 articles of wood were shown for the first time the almost startling smoothness and high lustre of which astonished all experts, the latter properties being enhanced by the contrast supplied by objects, japanned and polished in the usual manner, exhibited by the side of them. The procedure by which this extraordinary smoothness and, at the same time, extremely small consumption of polish or lacquer are attained is a very simple one, and is based upon a mechanical closing of the pores of the wood by a composition of certain ingredients, hitherto the property of the inventor. This composition, termed "wood-filler," is supplied in closed tins as a thick, sticky mass, and in applying it the quantity to be used is thinned to the consistency of ordinary varnish by adding good turpentine. The mass thus prepared is put on to the finished woodwork with a moderately stiff brush, and left to coagulate. When this coating, from a shiny appearance, becomes dull, the mass is rubbed across the grain of the wood and well into it with a handful of wood shavings or a suitable piece of wood, at the smooth bottom of which a piece of stout leather has been fastened. Care must be taken that everything on the wood is rubbed clean off, only the "filler" remaining in the pores. The wood thus prepared is left to dry for the space of eight hours, this being quite long enough to harden the filler. The latter is also said to act as a preservative of the wood, as it is not attacked by the influence of the atmosphere, nor by chemicals. After the hardening of the filler, the wood is once more well rubbed with glass paper, and the polishing or lacquering may be at once proceeded with. Less polish, time, and labour are said to be required than with the usual method; no sweating of oil takes place, as none has been absorbed by the wood. The lustre is, at the same time, most remarkable; there is a glassy surface; its durability is stated to be unlimited.

The American wood-filler is supplied in two colours,—white for light woods, brown for dark woods. Any shade may be produced by a corresponding blending of the two. The white wood-filler consists of one part by weight of pulverised starch, one part of barytes, and one-sixth part of dryer; the dark filler, of the same materials, with the addition of one-half part of brown. The finely-ground dry substances are well mixed with the dryer, rubbed down fine in a colour-braying machine, and are now,—thinned with turpentine,—ready for application as "wood-filler."

THE FLOORING OF COLOGNE CATHEDRAL.

This question has for a long time occupied the attention of the cathedral authorities, and, although public notice has not been taken of the fact, experiments have been carried on in a small portion of the northern nave, which has been enclosed for that purpose. Looking at the matter from a theoretical point of view, the *Cologne Gazette* remarks that the principle of Gothic architecture, which introduced pillars instead of wall-surfaces, tended to encourage plastic instead of pictorial ornamentation as an adjunct of ecclesiastical architecture. Polychromatic and mosaic effects were gradually banished, and the Chapter is reminded that, however appropriate a flooring in a carpet-pattern might be in a church built in the Roman style, such an arrangement would be out of place in such a representative monument of Gothic architecture as the Cathedral of Cologne. The importance of uniformity between the general ideas which pervade the architecture of the cathedral and its flooring is urged in the remarks made. It is maintained, however, that with proper limitations as to colouring and style of design, an ornamental flooring is not out of place. St. Bernard used to protest against the flooring of churches containing representations of a sacred character which would be subjected to the desecration of being trodden upon. The *Cologne Gazette* is of opinion that this argument is liable to be carried to excess, for there is never any scruple in exposing the images of saints to all the winds of heaven on the exterior of a church. It is urged that the stained-glass windows point to the necessity of the flooring not being entirely devoid of ornament, and as a limitation of the extent of pictorial decoration allowable in such a case, it is remarked that the figures should never become plastic, or apparently rise from the surface.

As to the material for the flooring (apart from the question of its ornamentation), none of the various plans suggested seem to have

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met with universal approval. Marble, sandstone, and ceramic ware are the three principal substances between which a choice may be said to lie. Marble is practically excluded, from the fact that its costly nature would only render its employment excusable on the ground of the dignity of the purpose for which it is used. Thus there only remain stone or dull unglazed tiles, and a combination of the two is suggested as a possible means of solving the difficulty.

The plan which is now before the chapter is nominally an improvement upon one designed in June, 1881, the drawings of which do not appear to bear any signature. The improvements do not seem to have any practical value. A chequered design of the commonest kind is (according to the *Cologne Gazette*) the foundation of this plan, and it is remarked that it is of a character which would be condemned if suggested for a railway station or a market. It is stated that this plan is designed to be carried out in marble. It is urged that a thorough examination by competent authorities of the entire question is absolutely necessary.

TECHNICAL SCHOOLS.

Mr. William Woodall, M.P., in concluding his address as president of the Education Department of the Social Science Congress at Nottingham, said:—I must now ask leave to return to the pupils of the primary schools, for whom we have seen provision made up to the time when, by age or by compliance with the educational conditions, they leave to take their part in industrial occupations or the other duties of life. With a large proportion of these, as is well known, the leaving school is equivalent not merely to the discontinuance of a study, but to the loss of the major part of what has been there acquired. No view of our subject is more worthy of careful and earnest thought than that which prompts us to take steps which will make permanent the acquirements and the good influence of the school, and to devise some way by which the zest for knowledge may be strengthened, and continuity of instruction be unbroken. In some Continental countries children are allowed to go into employment at twelve, on condition of their attending the *Fort Bildung Schule* until they reach sixteen. But whether compulsory attendance is enforced or not, throughout Germany the necessity for these Continuation Schools is universally felt by the authorities, and they are greatly appreciated by the people. There is much diversity in their character, and the titles by which they are known; sometimes the classes are held on two half-days a week, sometimes as Sunday schools, generally in the evening, and in the Communal Primary School Buildings. They undoubtedly serve useful purposes in preventing the waste of the labour and expense incurred in primary instruction, they carry on pupils to the age when they are more likely to realise for themselves the practical value of knowledge, and apparently they prepare their pupils, by cultivating in them the habit and taste which find profitable exercise in the various technical schools which are now exciting so much interest. The experience of our English Mechanics' Institutions has been that an interval of some three years usually elapses between the time at which a boy leaves his day school and that at which he is prompted to join an evening class. The gap finds him without the controlling restraints which in former days were part of the discipline of apprenticeship. He is in the possession of new freedom and new appetites, and exposed to mischievous influences against which he is as yet unarmed by the knowledge he is destined to acquire only by costly experience. The filling of this gap is the problem which has exercised, not without success, the minds of many earnest people, and nowhere more than in this good town of Nottingham. Hitherto the Government aid given to night schools was limited to payments for instruction in the "three Rs." In their time these evening classes have been of considerable utility to those who had to lament the neglect they had experienced in their early days. But, happily, this class is steadily disappearing, and under these circumstances the Government have wisely remodelled the provisions of the Code affecting night-classes, and grants are now to be paid in aid of teaching in the class and specific subjects, as well as in the higher elementary standards. The concession is a most important one, and the changes are avowedly for the purpose of supplementing the work of the day schools. These new night schools ought now to be made to serve, in conjunction with other classes diversified according to the occupations and wants of different localities, the purpose of the *Fort Bildung Schulen* of Germany. Obviously, too, these classes ought to be able to earn grants from the Science and Art Department, and every such school should be the nucleus of a group of technical classes, such as those which, to their honour, the representatives of the local trade unions, in concert with the educationists of Nottingham, are endeavouring to establish here for training, as they express it, "both the mind and hand of all persons engaged in handicraft trades, so as to make them intelligent and skilful workmen." In company with my colleagues the members of the Royal Commission appointed to inquire into the subject of technical instruction, and in discharge of the duty confided to us, it has been my privilege to visit many foreign countries and to see much of what is being done on the Continent. You will not expect me to anticipate in any statement here the report which will be made to Parliament when our investigations have been completed. But there are facts which are open to the view of every intelligent observer. It is impossible to over-estimate the zeal and activity which is everywhere apparent, or the vigorous and costly efforts which are being made to satisfy the eager demand, or to stimulate the desire for instruction. The preliminary Report of the Commission presented last February will have testified to the progress which France has made in recent years, and to the fact that from the commencement of the present year education in all the elementary schools is gratuitous, as is also the case in all the superior primary schools in which technical instruction is given or trades are taught. The action taken by the State is well seconded by the municipalities, by other local bodies, and by trade syndicates, while the religious orders engage in vigorous emulation. The expenditure, though large, is fully sanctioned by the public sentiment, and the evening classes which we visited in Paris, Lyons, Toulouse, and other prominent centres, especially those in industrial art, were generally crowded to inconvenience. Apprenticeship schools, respecting which much valuable information has been published by Mr. Sylvanus Thompson, complete the necessary training for particular trades, while in the primary schools much attention is given to drawing and modelling, and in numerous schools in Paris the boys have manual teaching in wood and iron given in large school workshops furnished with lathes, benches, &c., for the purpose. In the German States, in Italy, in Switzerland, in Belgium there are equally earnest manifestations of the value which is set upon professional and technical training for all ranks. Besides the complete graduation of schools which lead up from the primary, on the one hand by the Gymnasium to the University, and on the other by the *Real Schule* to the Polytechnic, there exists an infinite variety of special schools for weaving, for dyeing, for building, for mining, for clock-making, for wood-carving, for metal work, for pottery, and for art in application to other local manufactures. In parts of Switzerland the Cantonal Budget applies to education nearly one-third of the whole revenue, while the towns sustain the primary schools with great liberality. We hear much of the enormous expenditure on the military system of Germany, and it is truly large. But in some of the German States the aggregate expenditure on education will bear comparison with their quota of the German war tax. Last year the City and Guilds of London Institute published a most valuable work which ought to have been read with great interest in Nottingham, because it describes with great force as well as minuteness the system of education in a Saxon town of 90,000 population, which appears to have successfully competed with this district in one of its long-established staple trades; and because, further, it is written by a gentleman who, although now engaged in business at Chemnitz, earnestly desires the welfare of his native town of Nottingham. Mr. Felkin describes the provision for general instruction as having been provided at a cost for buildings of 153,000*l.*, while the technical school buildings have cost 88,000*l.* The cost of maintenance may be imagined when it is seen that 363 teachers are employed, and that the fees are so low that they are no impediment to the poorest pupils. The State technical institutions and the higher weaving school there, as well as the hosiery school at Limbach close by, have beyond doubt had an enormous influence in advancing the prosperity of Chemnitz, and the recommendations which Mr. Felkin makes may well be pondered by all who are concerned in the maintenance of the industrial supremacy of our own country. I cannot leave this subject without felicitating the inhabitants of Nottingham on the efforts which they have made in the right direction, and upon the valuable assistance which they have received of 500*l.* a year through the agency of the City and Guilds of London Institute from the Drapers' Company, which I am told now subscribes 4,500*l.* a year in aiding that valuable organisation to stimulate local efforts of the description which are now being made in connexion with Nottingham College. The estimate of what is being done in other countries would be very incomplete without some reference to the influence which is exerted by the museums in which, in addition to the examples of general, artistic, or antiquarian interest, there are generally good collections of machines and models of mechanical appliances. There are also often preserved specimens of the manufactures of all countries and periods which can be supposed to be of interest to the local producer, which are carefully classified and made easily accessible to all persons concerned. At Carlsruhe, and at Nuremburg too, at this moment there are exhibited illustrations of the extent to which the teaching in the schools of design is applied by manufacturers, and which afford very convincing evidence of the essentially-practical character of that teaching, and of the familiarity of the teachers with the requirements of the local trades. In bringing this paper to a conclusion, I feel a certain sensation of regret that so much of it has apparently been devoted to considerations which may seem to appeal to merely mercenary motives. I trust, however, I shall not be misunderstood. The commercial and manufacturing supremacy of England is as essential to the influence it exercises as a great governing and civilising power as it is to the continued welfare of its own population. The stranger who visits the professional school at Rouen will find a cabinet of objects, in the centre of which is a Prussian helmet; and he will be told that this relic of the invasion of ten years ago is preserved as a reminder of the humiliation which was brought upon France by its neglect of the education which gave the Germans their superiority in war. The rapid and triumphant march of events in Egypt during the last few weeks has shown how accurately to-day we may speak of the art of war. And so in arms, in arts, in commerce, as in all the important engagements of life, bearing our part, as we are called upon to do, in a world which is ever moving at an accelerated pace, the very condition of existence is that we should adapt our institutions to the progressive condition of things, and this will we do, conscious that the effort it involves will only strengthen our sinews for any strain they may be called upon to bear in the future that is before us.

BRYNCRÛG CHURCH.

A memorial church to the late Mr. Wynne, F.S.A., of Peniarth, has just been completed at Bryncrûg, near Towyn, Merionethshire, from the designs of Mr. B. Edmund Ferrey, carried out by Mr. Richard Morgan, builder, of Bryncrûg. In plan, it consists of a nave, 36 ft. by 20 ft. 3 in. broad, with south porch; and a chancel, 19 ft. by 15 ft. 9 in. An archway on the north side of the latter opens out into a small vestry, screened off. At the west end is a massive bell-gable. The walls are built of a beautiful grey-coloured syenite, with Ruabon stone for the dressings. The roofs are covered with a local bluish-grey slate, with red ridge tiles. The nave has an open pitch-pine roof, with ornamental moulded trusses at intervals; and the chancel a panelled ceiling of the same wood, with carved cresting to the cornice. The nave is supplied with plain open pitch-pine benches, and English oak seats and prayer-desks to the chancel of a more ornamental character. The pulpit is of English oak, with perforated panels, standing on a base of Shropshire red sandstone. The paving is of Godwin's tiles, arranged in patterns by the architect. The font is of Ruabon stone. The windows are glazed with quarry cathedral and clear white glass, in various ornamental devices. The heating apparatus is on the system of Porritt, of Bolton.

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SALES OF BUILDING LAND.

Last week Messrs. Baker & Sons submitted for sale, at the Stag Inn, South Acton, the third portion of the Beaumont Park Estate, at South Acton, belonging to the National Liberal Land Company. The plots offered were seventy-five in number, some of them containing frontages of 16 ft., and others of 18 ft., with depths ranging from 64 ft. to 133 ft. There was a numerous attendance at the sale, and sixty out of the seventy-five plots offered were sold. The plots having 16 ft. frontages and 64 ft. in depth realised prices averaging 52*l.* each; those having frontages of 18 ft., with a depth of 120 ft., were sold for from 66*l.* to 70*l.* each; whilst the plots having a depth of 133 ft. realised 90*l.* each. The total proceeds of the sale amounted to about 3,200*l.*

Mr. Richard J. Collier also last week offered for sale a freehold building estate at Hendon. The property is situated close to the Hendon Station on the Midland Railway, and within a few minutes' walk of the Welsh Harp. The plots were described as having frontages to Edgware-road and the several new roads leading there from, and the estate was described as offering attractive sites for the erection of small residences, for which there is a great demand in the locality. The number of plots submitted was sixty-one, of which forty-two were sold, thirty-four of them having frontages of 17 ft. and a depth of from 80 ft. to 90 ft., realising prices ranging from 54*l.* to 66*l.* each. Four shop plots, with frontages of 19 ft. and a depth of 86 ft., were sold for 100*l.* each, and four other shop plots, containing a similar area, realised 90*l.* each. The entire proceeds of the sale amounted to 3,406*l.*

ST. JOHN'S CHURCH, DÜSSELDORF.

The new Church of St. John, Düsseldorf, of which we give an exterior view in our present issue, has been the outcome of long-continued efforts on the part of the Evangelical community of the town. So long ago as 1855 the nucleus of the building fund was formed, and twenty years later, in 1875, the building site was acquired. But the foundation-stone was laid the same year, and the church, of which Herren Kyllmann & Heyden, of Berlin, are the architects, was recently opened for public service. The style chosen by them is a blending of Gothic features with Italian Renaissance, the most striking characteristic of the building being the very elegant steeple. The exterior of the church needs no description, being well represented in our engraving. On entering the building by the vestibule under the tower, the view is a very fine one, a most striking impression being produced by the ample flow of light coming in through the broad windows. The high arches are semicircular; the ceilings, pillars, and walls are decorated by dull colouring. In the centre of the apse, which is somewhat higher than the floor of the nave, the altar, of black marble, and surrounded by a gallery in white marble, is placed. The pulpit has been placed in the nave, to the right of the altar, at the principal pillar of the intersection. The organ, flanked by the choirs, fills the whole width of the nave. Its builder is Herr E. F. Walter, of Ludwigsburg. Generous donors have provided the altar, pulpit, painted windows, a set of bells, the tower clock, &c.

NEW BRANCH BANK AT LEEK FOR THE MANCHESTER AND LIVERPOOL DISTRICT BANKING CO., LIMITED.

These buildings are now approaching completion. They occupy an important site in Derby-street, the main thoroughfare of the town, and closely adjoin the old Roebuck Hotel, an interesting bit of "black and white." The frontage of the new premises, which include a commodious house for the manager, is about 80 ft. The materials used in construction are thin dark-fired red Ladderedge bricks, with pink Roche stone dressings: the exposed timber framing and cornices, and doors and windows to the street, are of teak; the decorations in the gables are modelled in Portland cement; Broseley tiling is used for the roofs; and the windows in the main are glazed with patent plate in lead quarries. The portico has a high dado of Burmantofts thin glazed russet bricks, Roche stone dressings, and a frieze of Mr. de Morgan's tiles.

The length of the banking-room, each end of which is segmental in plan, is 48 ft.; its width, 24 ft.; and its height 15 ft. In view of the cost and great inconvenience to business of periodical renovation, this room is finished throughout in durable material which will not require it. The walls, arcaded, have bands of St. Sylvester marble and white marble concrete, with the moulded parts in scagliola to match the St. Sylvester. The fireplaces are furnished with dog-grates in tiled recesses, with Dove marble chimneypieces in harmony with the rest of the interior. American walnut is used for the wainscoting of the walls, the doors, and the counters and desks, which are made to the architects' designs. The panelled ceiling is of American whitewood and walnut and old-seasoned pitch-pine: it is fixed under a fire-proof concrete and iron flat, which carries the leads.

A short corridor from this room gives access to the consulting-room and the large cast-iron strong-room. In the basement there is ample accommodation for storage.

The works are being carried out in a substantial and satisfactory manner under the direction of the architects, Messrs. William Sugden & Son, Leek. The builders are Messrs. Isaac Massey & Son, of Alderley Edge; the sub-contractor for the brickwork is Mr. Broadhurst; for the stone-masonry, Mr. Leadbeater; and for the plumbing, &c., Mr. Edwin Phillips, of Leek. The heating (by warmed air) has been entrusted to Messrs. Haden, of Manchester, and in conjunction with them a scheme of general ventilation has been arranged. Mr. Roddis, of Birmingham, and Mr. Millson, of Manchester, are carving the wood and stone; and Messrs. Collinson & Lock are modelling the decorative plaster-work,—all to full detail drawings by the architects.

EAST SUSSEX, HASTINGS, AND ST. LEONARD'S INFIRMARY COMPETITION.

We illustrate this week the design submitted in this competition by Mr. H. H. Bridgman, architect, of 42, Poultry.

It consists of a block of buildings extending nearly the whole length of the site (which fronts the sea immediately opposite the pier), a length of 198 ft., and on an average 28 ft. deep, with the exception of two projected portions, which take up the limited building line, and is five stories in height, the lower story being sunk about 4 ft. only below the Parade level. The 24 ft. wards, with cross ventilation, have been adopted for all wards of more than three patients, without exception. The general arrangement of the building is: administrative department and children in the centre, men left, and women right. There are two staircases, with an ambulance lift within each. The kitchen, stores, and servants' rooms are in the rear, and nurses' dormitories on the top. Two airing-yards, 40 ft. by 30 ft. each, clear space, are arranged for in the rear, giving a compact whole, airy and well lighted, and ensuring perfect classification and facility of administration.

The basement or sub-ground floor is approached by a short flight of six steps, and contains in the front centre the out-patients' waiting-hall, 48 ft. by 28 ft. 6 in., entered from the open areas, and seated to accommodate eighty patients, with physicians' and surgeons' rooms, &c., on either side, the dispensary being in the middle, adjoining the waiting-hall. The medicines are sent up to the various wards by light lifts. The two ends of this story contain wards for male and female contagious cases, four of each sex, with day-room, nurse's room, bath, water-closets, &c., attached. These wards have no communication whatever with the interior of the building, but are quite isolated, and entered from the outside. 6 ft. in height of this story being above the street level, perfect through ventilation is secured. In the rear extreme corner at one end, and detached, are provided the mortuary, *post-mortem*, and ambulance rooms, whilst in the opposite back corner, also detached, are the workshop, coffin-store, and disinfecting house. From each staircase there is an approach to the kitchen apartments, and the staircase lifts are used at meal-times for speedily supplying the various wards with food. The kitchen is 32 ft. by 20 ft., and 19 ft. high, lighted on two sides, and having two skylights for carrying off the heat and steam. On one side of the kitchen are placed the larder, pantry, and wash-up room, and on the other side the general scullery, bread-room, and china-stores; the coal-stores, water-closets, &c., and ovens, projecting from the kitchen, being placed under the footpath of the back road. The large open spaces above referred to ensure ample air space all round. In a mezzanine story over the side rooms are the general store-rooms of the infirmary.

The ground-floor is 6 ft. above the Parade level, and approached by a flight of steps and through the principal entrance and hall. Immediately opposite the entrance, the operating-room, 22 ft. by 18 ft., is entered; the casualty-rooms, surgeon's appliances room, &c., adjoin. In the front, on one side of the entrance, are the committee-room, &c., and on the other side the office and surgeon's house, whilst the ends of this floor are occupied by accident wards, ten and eight of each sex, with nurses' rooms, baths, watercloseets, &c, the latter projecting at the ends. From the staircases on this floor is approached the nurses' general dining-room, immediately over the kitchen, and which is supplied by small lifts direct. On this level also are all the male and female servants' bedrooms.

The centre portion of the first floor contains twelve children, six of each sex, with a nurses' room; bath and waterclosets (built out) adjoin for each. The ends of this floor are occupied by two general wards, ten and eight of each sex, with nurses' rooms, baths, and waterclosets, as below; whilst two convalescent wards, 24 ft. by 16 ft., for each sex, occupy the projections.

The second floor contains, in the centre, special wards for six men and six women, with nurses' rooms, baths, and waterclosets, as before. The ends are used as general wards, eight of each sex, and the arrangement below is repeated, excepting that on the men's side there is also a separate ward for two, whilst on the women's side are the matron's rooms.

The third floor is a repetition of the second floor, excepting that the eye wards are on this floor, and the centre portion is taken up with nurses' dormitories.

It will thus be seen that every section overlooks the sea, balconies being provided on all floors to enable the patients, when convalescent, to enjoy the full benefit of the sea air. Each section, without exception, has its own nurses' room, baths, and waterclosets. The latter are in all cases built out and cut off by an intervening lobby, and are adjacent to their respective wards. The staircases pass up close to the ward doors, and the lifts within them extend to every story. The contagious cases are quite isolated. The out-door patients have no communication with the indoor, and the kitchen departments are apart, though easily controlled,—all being important points for consideration.

The principal elevation, which is a simple and free adaptation of Renaissance in red brick and stone, is broken up by two projections dividing the building into three bays, the roof being rather high-pitched, and at the intersections are two open turrets utilised as ventilators for the staircases, whilst there is a slight break in the centre, having an elliptic and rusticated arched entrance, supporting a balcony which runs the entire length between the projections. The centre is crowned with a pierced pediment resting on small fluted piers, with side scrolls and carved work. Balconies occur in all instances, except at the projections. The building itself is designed to accommodate 108 patients, at an estimated cost, including the allowed 10 per cent. margin, of 12,110*l.*, or about 112*l.* per patient.

NEW ROMAN CATHOLIC ORPHANAGE, HOMERTON.

This orphanage, of which view and plans are given, is for the reception of 120 Catholic girls from the workhouses, and is being erected at the expense of the "Sister Servants of the Sacred Heart of Jesus," a community whose services are devoted exclusively to the poor and sick, visiting and nursing them night and day at their own homes gratuitously without distinction of religion.

As shown by the plans, the new buildings for the children are attached to an old house which is used by the community for their convent, and which stands in about an acre of garden very advantageously situated, with frontages to Hassett and Ballance roads,—the general orphanage facing the latter, and the infirmary, separated by the convent, facing the former.

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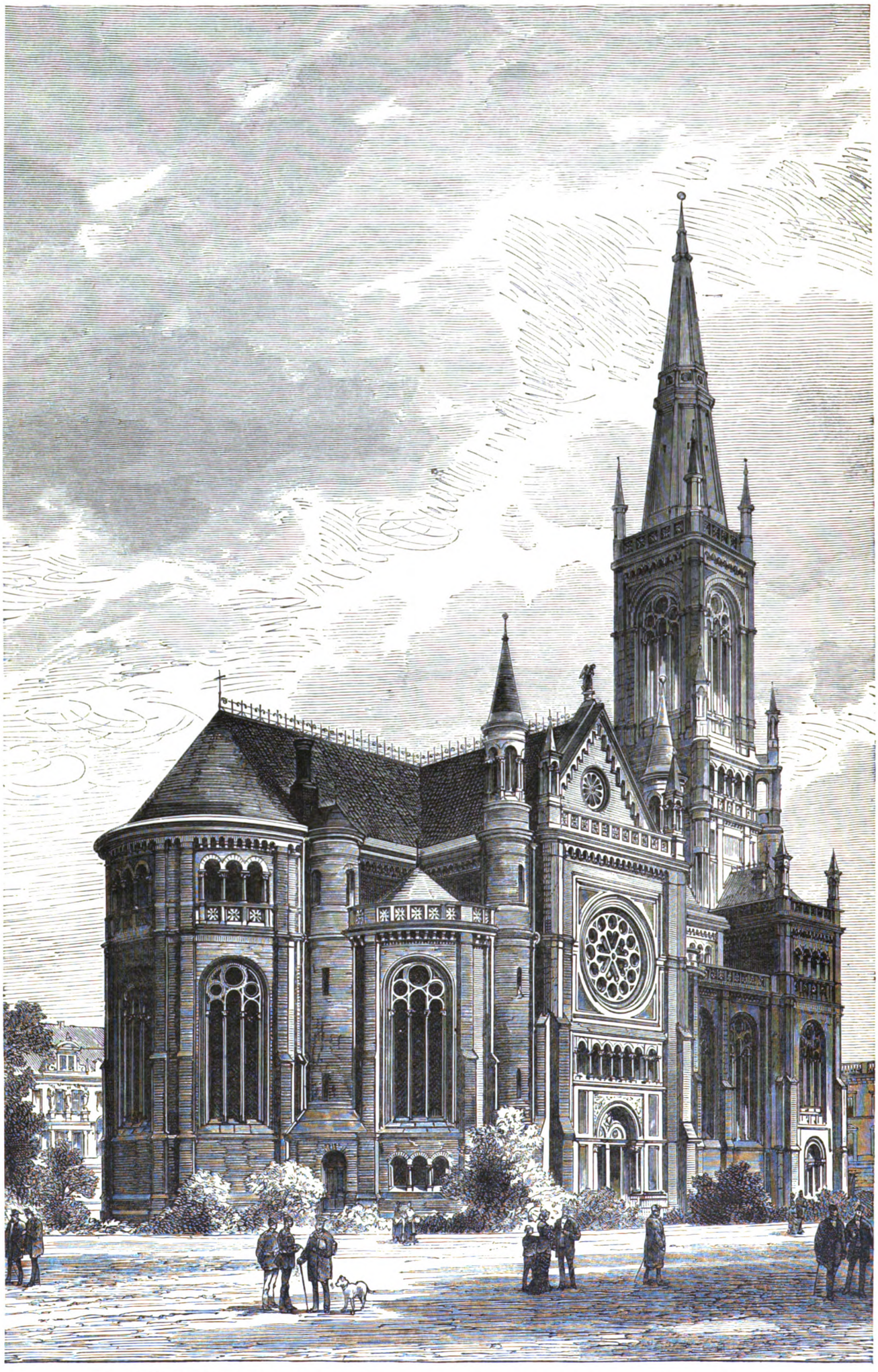

ST. JOHN'S CHURCH, DÜSSELDORF.—Herren Kyllmann and Heyden, Berlin, Architects.

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New BRANCH BANK *Buildings at* LEEK *for the*
MANCHESTER and LIVERPOOL DISTRICT BANKING COMPANY
Limited

William Sugden & Son
ARCHITECTS

LEEK, JUNE 1882.

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Wyman & Sons, Printers, Gt Queen St

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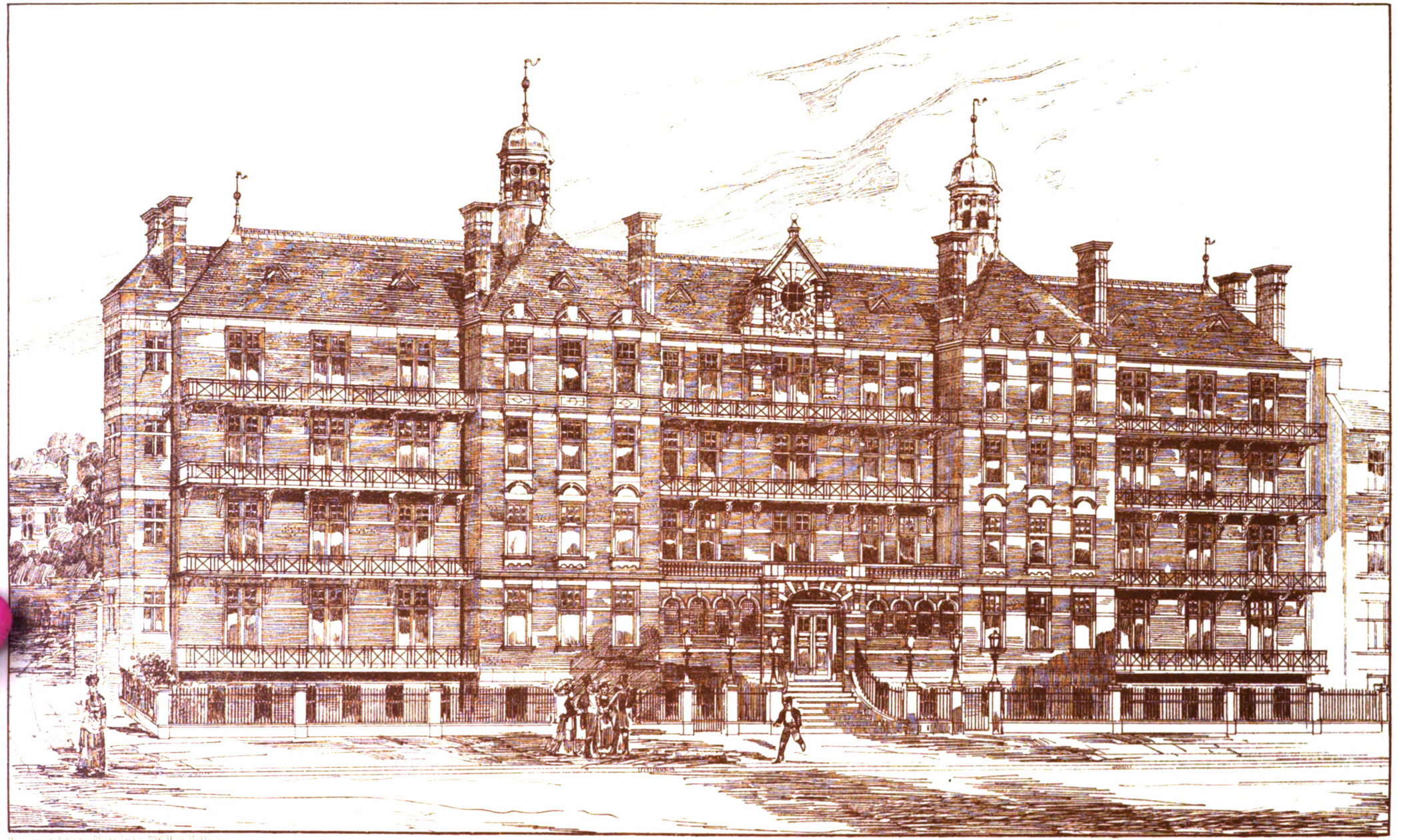

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EAST SUSSEX, HASTINGS, AND ST. LEONARD'S INFIRMARY.—Mr. H. H. Bridgman's Design.

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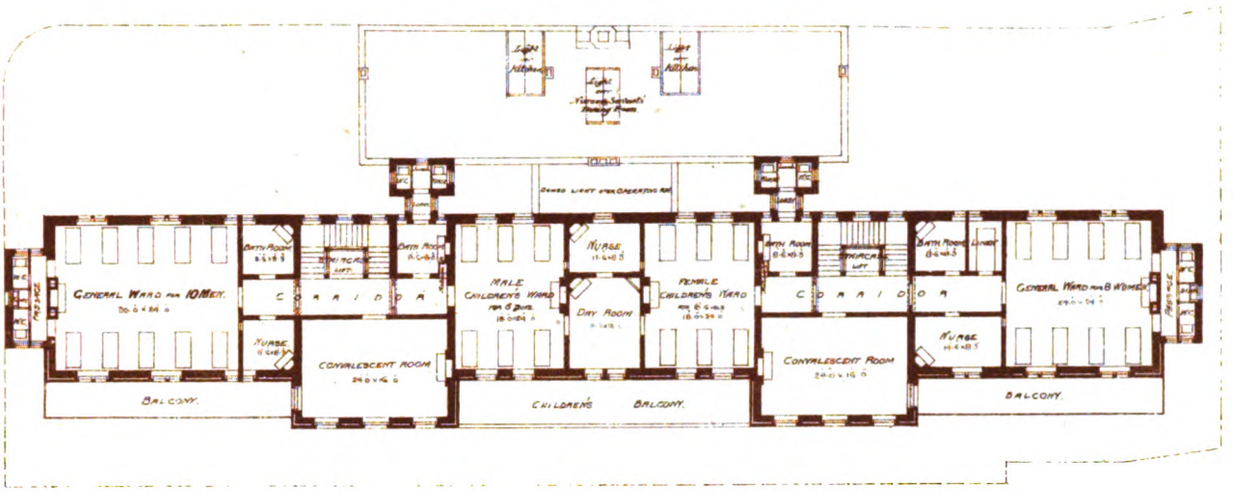
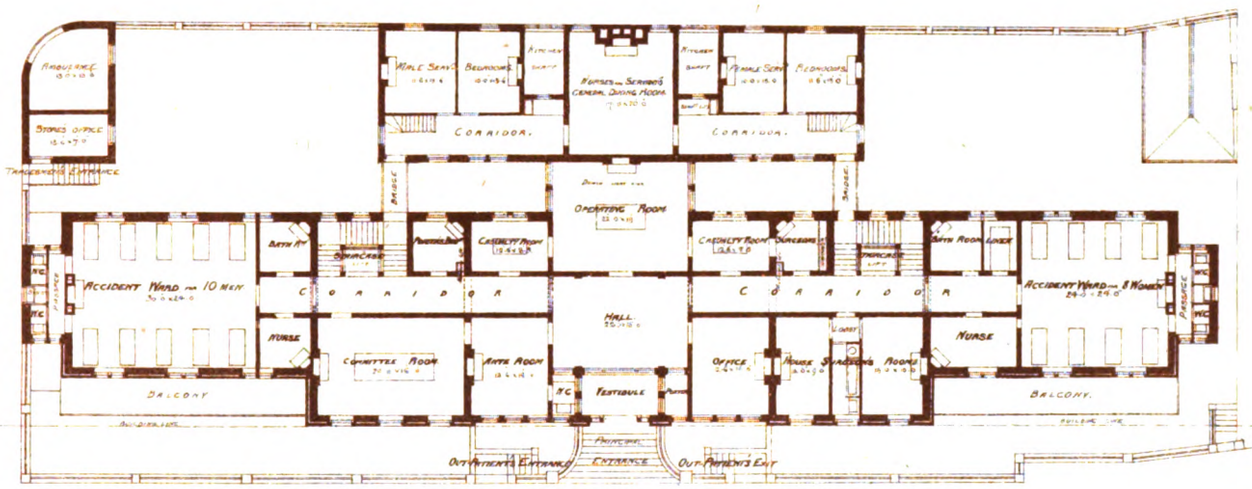
EAST SUSSEX, HASTINGS, & ST. LEONARD'S INFIRMARY.

Mr H. H. BRIDGMAN'S DESIGN.

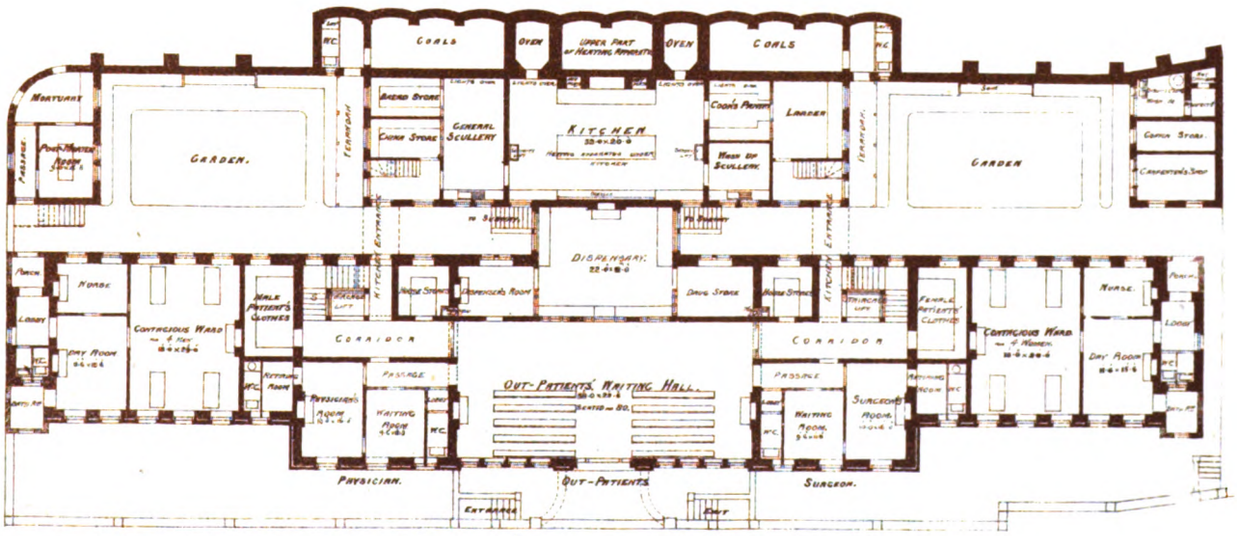


FIRST FLOOR PLAN



GROUND FLOOR PLAN

MEZZANINE over KITCHEN



PLAN OF SUB-GROUND FLOOR.

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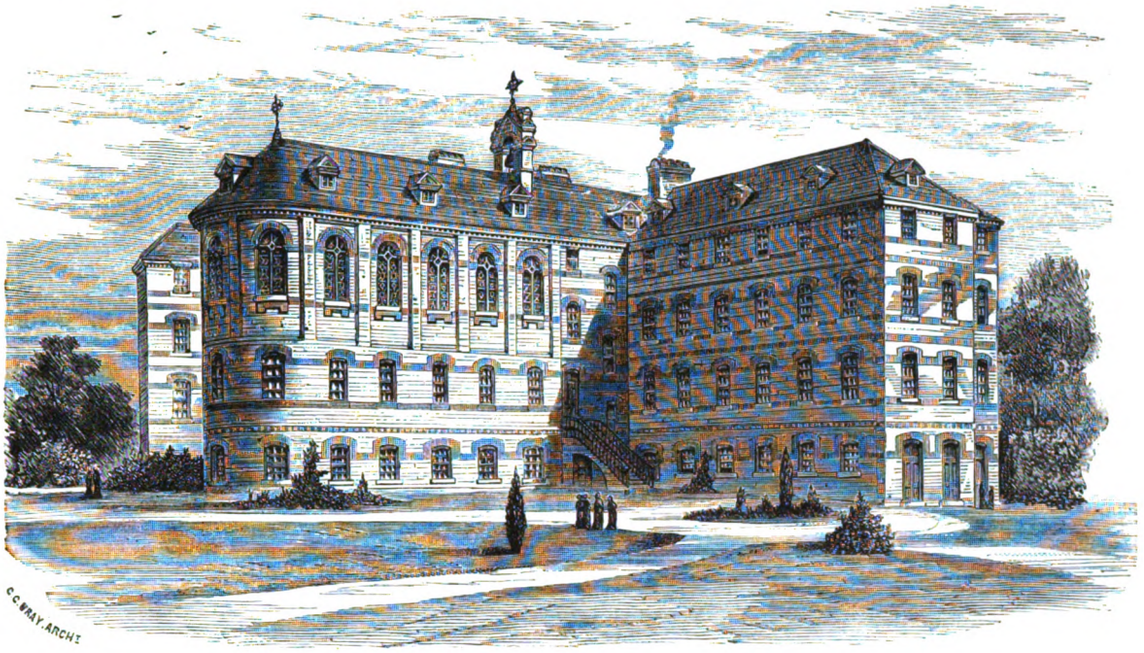
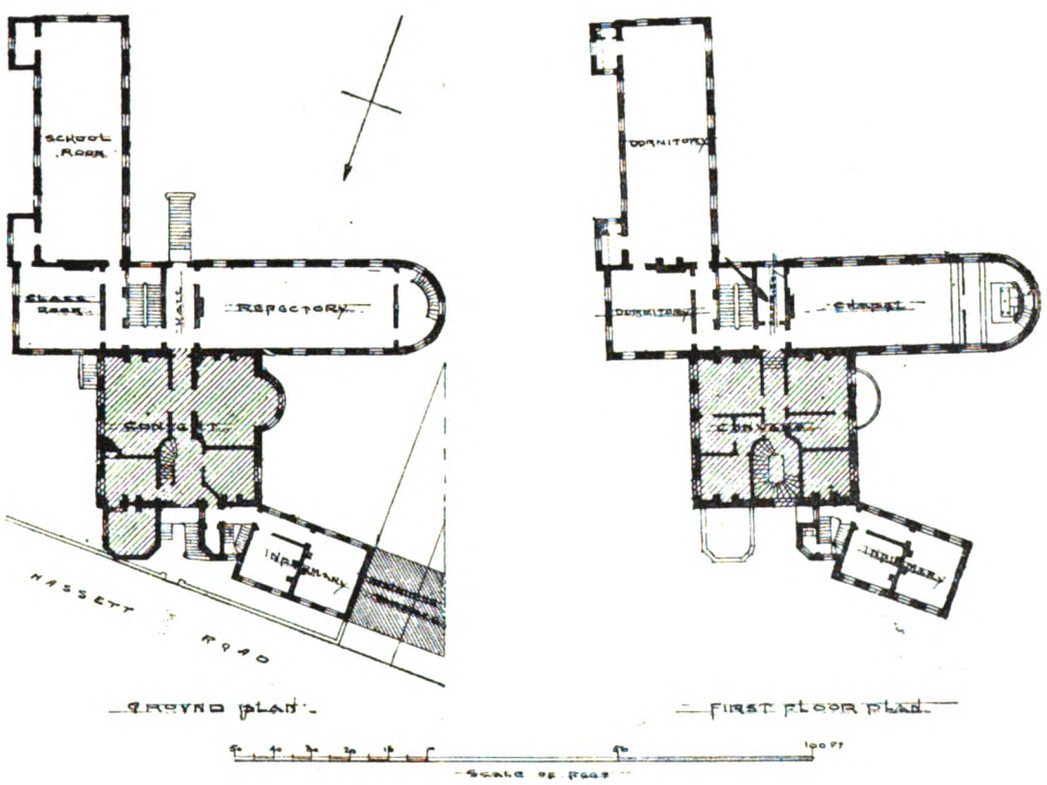


NEW ROMAN CATHOLIC ORPHANAGE, HOMERTON.—Mr. C. G. Wray, Architect.



On the basement floor, the children are provided with a play-room, 62 ft. by 21 ft., opening out into a play-ground, out of which is an inclosed water-closet yard, containing a range of sixteen of Bowes, Scott, & Read's patent self-clearing trough-closets. The lavatory and bath-room are also on this floor, the rest of which is taken up by the laundry, kitchen, larder, store-room and other usual offices. On the ground-floor is a school-room, 62 ft. by 21 ft., class-room 21 ft. square, and refectory also 62 ft. by 21 ft., with sewing-room in the apse at the end, and two rooms for the infirmary.

On the first floor are two dormitories of the size of the school and class rooms respectively, and a chapel of the size of the refectory, plus the apse at end, with a sacristy attached, and two rooms for the infirmary.

On the second floor are two dormitories and two rooms for the infirmary similar to those on the first floor; and the chapel, which extends to the height of two floors, is provided with an organ-gallery over the sacristy, and a gallery for the sick opening out of one of the rooms of the convent.

On the roof-floor are arranged convenient clothes, linen, and box rooms.

The school and class rooms are each provided with book-rooms, and the dormitories with night water-closets in an adjoining building, having exernal openings on three sides for free ventilation. The infirmary is also provided with water-closets on each floor similarly ventilated, and with bath-room and surgery, &c. The rest of the accommodation is devoted to the convent use.

The height of the rooms throughout is 12 ft., and besides the windows they are ventilated by Sherringham's ventilators placed between the windows in each wall. The interior of the chapel is 26 ft. in height to the wall-plate, and has a quasi hammer-beam roof with moulded brackets springing from stone corbels, the ceiling being lined with V-jointed matchboarding, and formed into panels with moulded ribs. The windows are glazed with cathedral glass in tints.

The elevation has been made of plain design to accord with the purpose for which the building is intended, the materials used being picked stock bricks with red brick bands for the facings, York stone sills, and slate roofs.

Messrs. Perry & Co., of Tredegar Works, Bow, are the contractors, Messrs. Fraser & Fraser, of Bromley-by-Bow, supplying the laundry, baths, and lavatory fittings. Mr. C. G. Wray, of London, is the architect.

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RECENT SANITARY WORK AT NEWCASTLE-ON-TYNE.

From a paper read at the congress of the Sanitary Institute by Dr. H. E. Armstrong, Medical Officer of Health, on the sanitary history of the town, we take the following:—

By the Newcastle Improvement Act, 1865, the Corporation obtained various sanitary powers, which, since that time, have not been allowed to lie dormant. Two years after the passing of the Act, several important sanitary reports were presented to the Town Council. From one of these,—the work of a committee under the presidency of Ald. Wilson, the chairman of the present Sanitary Committee,—it is evident that energetic action was then taken to put in force the different provisions obtained for the protection of the public health. Thus,—under the powers enabling the Corporation to raise in advance the moneys required for paving, sewerage, &c., a large number of previously defective streets were put in good order; the sanitary staff was permanently increased; active steps were taken to prevent overcrowding; upwards of 500 unhealthy dwellings were closed in less than two years, and to meet the difficulty of the persons removed from their homes, rooms were provided elsewhere by the committee; about a tenth of the most unhealthy of the dwellings before mentioned were purchased and pulled down; a temporary hospital, in anticipation of cholera, was erected on the town-moor, and a disused chapel in Forster-street, fitted up with beds for the same purpose, was soon afterwards successfully employed for the reception of cases of scarlet fever. A large special staff was also organised and engaged for a considerable period under the extensive provisions of the Sanitary Act of 1866, the town being divided into districts for the purpose. The ashpits, previously cleansed at the expense of the owners, were now cleansed out of the rates; vigorous measures were taken to purify tenement and other property, &c. The report shows that, at that time, upwards of 23,000 rooms, representing the dwellings of 55,000 persons, or half the population, were inspected, of which one-eighth were found to be without the means of good ventilation; the same proportion were without water; one-fifth were without privy accommodation; two-thirds only of the houses had good drainage, and one-eighth had none at all; nearly 8,000 persons lived in rooms yielding less than 300 cubic feet per person. The committee, among other conclusions, expressed their conviction that, for the cure of many of the sanitary evils of habitations of the lower classes, one remedy only would be effectual, the provision of other accommodation, the opening out of thoroughfares, and the demolition of habitations incapable of being put into proper sanitary condition. This opinion was given eight years before the passing of the Artisans and Labourers' Dwellings Act of 1875, of which it is the foreshadow. At the time of the report referred to, the annual death-rate of Newcastle was 32·3 per 1,000. It has since fallen gradually to 21·7 last year. Five years after this saw the birth of the Public Health Act of 1872, and in the following year, Newcastle, in common with other urban and rural districts throughout the country, had a medical officer of health. Of the doings of this functionary it becomes not me to speak. The proceedings, since his appointment, for the improvement of the dwellings of the poor, the prevention of disease and the sanitary benefit of the inhabitants in general,—are they not written in his nine annual reports? Among matters of importance in relation to the hygienic condition of Newcastle of to-day, not the least is the amount of recreation-ground open to the public. Including the Town Moor and Leazes (lands in grass, but not laid out ornamentally), and the Armstrong, Brandling, Elswick, and Leazes ornamental parks,—the exercise-ground to which the inhabitants have right of free access comprises a total area of 1,268 acres, being almost one-fourth of the entire city, and at the rate of one acre to every 114 persons,—an amount probably unequalled in any other large city or town. An official representation under the Artisans and Labourers' Dwellings Improvement Act, 1875, was made to the Corporation as the Local Authority in 1876. The areas specified in the representation were those of the New and Old Pandon Groups, the former of which has already been referred to. In support of this representation, the sanitary committee recommended the purchase of the property of the New Pandon Group, at a cost of 26,000*l.*, for demolition of the houses thereon, and the erection of new dwellings elsewhere. The buildings were ultimately acquired and demolished under the provisions of a local Act, and, as already stated, the hollow in which they stood is now filled up. A large proportion of the property in the Old Pandon Group has also been dealt with under the same power. Since the passing of the Newcastle-upon-Tyne Improvement Act, 1865, the cost of the different sanitary works executed by the borough engineer has amounted to upwards of half a million sterling, and included the following:—

Sewering	£74,583
Flagging and paving	172,370
Street watering	14,349
Scavenging	102,839
Ashpit cleansing	104,460
Other sanitary works	52,895
Total	£521,496

The powers with respect to the notification of infectious diseases and other sanitary matters,—acquired by the Corporation under the Improvement Act of the present year,—are fresh in the memory of this Association. The necessity for the provision of a new sanitary hospital to meet the requirements of this populous city, in place of our ancient fever house, has for years been strongly represented by the Sanitary Committee, and, in the abstract, is pretty generally admitted by all. But the mere indication of a *site* for such a purpose,—and many sites have, one after another, been proposed,—has invariably met with very great opposition. Dr. Armstrong concluded by remarking that the reduction of the yearly death-rate per 1,000 of the population by ten in as many years, and the diminution of typhus in the same time to one-fifth its prevalence in the corresponding period immediately before, are tangible results of their more than Herculean labours.

PLANS AND PLANNING.

This was the subject of the public introductory lecture (delivered on Wednesday evening last) to Professor Roger Smith's courses at University College (Session 1882-83) on Architecture, Construction, and Modern Practice. Planning, the lecturer observed, was one of the radical elements,—he might almost say the foundation-stone,—of all architecture. A plan was a map of a building as it would appear if everything above a certain level were removed. In other words, it represented the floor of the building, and, to a certain extent, the walls and the openings therein. The plan of the principal floor was the most important drawing made when the drawings for a building about to be erected were prepared, for upon it the success of the building mainly depended, not only as to matters of contrivance, but in regard to architectural effect. All buildings, reduced to their simplest elements, contained never more than six, sometimes only four parts. The floor, walls, roof, and openings were the four essentials of every building. If to these were added columns and ornaments, there were thus found to be six elementary groups of things, all or some of which went to make up every building. Although the plan was mainly intended to represent or map out the floor of a building, it also represented, as he had said, the walls and the openings, and at the same time indicated, to those who knew how to read it, the method of roofing. It was so seldom that opportunity offered for thinking out the nature of things that many young architects who were engaged on plans believed themselves to be occupied in arranging the walls of the buildings, whereas they were really arranging the floor,—a work which, although the least recognised, was perhaps the most important which the architect had to perform, inasmuch as it involved the disposition of the site to the best advantage. The first attempt to group or classify plans would show that they were comprised in two great main classes or divisions, which, for want of better terminology, he should distinguish as single and complex plans. What he called single plans were those of buildings which consisted in the main of one interior bounded on all sides by the external walls. On the other hand, what he designated as complex plans were those of buildings which consisted of a number of separate parts welded together into one whole. The single plan, then, was one with an undivided floor, while the complex plan was one in which the floor was divided into several spaces. Buildings with single plans were, and always had been, those which possessed the highest merit as works of architecture: hence St. Paul's and Westminster Abbey claimed higher rank than the Bank of England or the Houses of Parliament. The greatest buildings of the world were those which were planned as single structures. The Egyptian and Assyrian temples were illustrations of complex planning, those buildings being made up of a number of parts; but when we came to the Greeks, — the greatest of all architects, and the foremost of all artists, — we found that their great buildings were almost all single in plan, and very simple. As a work of architectural art the Greek temple took the highest rank. The Romans erected buildings which were both single and complex in plan, but judging of their works from what remained, we justly regarded the Pantheon and the Colisseum,—both single plan buildings,—as the finest specimens of Roman architecture. The Parthenon at Athens might be taken as a typical example of the great series of temples erected by the Greeks and Greek colonists. Here we had a floor space of very moderate size, divided into two chambers, in the larger of which the figure of the goddess was placed. These chambers were enclosed by massive walls, and there were indications of internal columns. The peristyle, extended at each end so as to form a deep portico, and the stylobate, extending all round the building, were elements of grandeur in the plan. The exterior of the temple was most carefully studied and richly adorned. We were, for the most part, ignorant of what the appearance of the interior must have been, but however beautiful or highly decorated, there was little reason to suppose that it was at all so powerfully impressive as the exterior. A noteworthy feature in the plan of the temple was the absence of openings, which led to the inference that the temple was lighted from the top, an inference supported by the presence of the interior columns referred to. The absence of outward thrust by the roof was indicated by the disposition of the columns of the peristyle in relation to each other; these were among other points clearly indicated by the plan. The Pantheon at Rome afforded another notable instance of a single plan. Even were the vast dome of the building non-existent, the great thickness of the walls, and the absence of columns in the interior, would indicate the method of roofing, while the absence of openings in the walls would suggest that the interior was lighted from above. The ground-plan of Westminster Abbey, or of any other great Christian church, afforded another type of single plan, in striking contrast to that of the Pantheon. The clustered pier-shafts, with buttresses to the walls opposite them, would, in the absence of the roof, indicate to the architect, or to any one able to read a plan, that the roof was vaulted. The apsidal east end would show him how that part of the building had been influenced by French examples. The large amount of window-space in Henry VII.'s Chapel would indicate that the architect was desirous of obtaining as much space as possible for stained glass. Westminster Abbey was a single instance, but a very perfect one, of the planning of Gothic churches of large size. Another group of single plans comprised those which characterised the Christian churches of the Greek or Eastern communion, and of which Sta. Sophia at Constantinople and St. Mark's at Venice were well-known typical examples. In these plans the aim had been to get a large central space roofed in by a dome, surrounded by a number of smaller spaces roofed by smaller domes. Suggested by these plans were those of St. Peter's at Rome, our own St. Paul's as carried out by Wren, and Wren's first plan for St. Paul's. Wren appeared to have attached great importance to securing uninterrupted vistas along the nave and choir aisles across the transepts, and in order to do this he had to plant his dome on eight piers. In St. Peter's at Rome the dome was carried on four very massive piers only, but these piers had necessarily to be so placed as to destroy the aisle vistas across the transepts. Although this was to some extent a disadvantage, it was, perhaps, preferable to the method adopted by Wren, who seemed to carry his idea too far. Had he followed the same course as that pursued in St. Peter's, the nave of our metropolitan cathedral would not have that appearance of narrowness and crampedness, in propor-

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tion to the rest of the building, which was noticeable. Passing to the consideration of specimens of complex planning, Professor Smith instanced the plan of the Egyptian temples, specially mentioning and describing that at Carnac, the Assyrian palaces explored by Layard and others, the Baths of Caracalla at Rome, and, as a typical Roman dwelling, the so-called house of Pansa at Pompeii. When civilisation was thrown back by the destruction of the Roman empire, the need for complexly-planned buildings did not assert itself for a long time, but gradually the wants of the great monastic houses, and the requirements of the occupants of castles and palaces, led to a development of complex planning which had been carried on through the seventeenth and eighteenth centuries down to the present time with continually increasing demands on the skill of the architect. For Wren must be claimed merit of a high order for plans of domestic buildings, such as Chelsea and Greenwich Hospitals, and still more so for the Palace at Whitehall, of which the Banqueting Hall,—now the Chapel Royal,—was the only portion built. The planning of our ordinary dwelling-houses was necessarily complex, the problem being to provide for continually-varying requirements on sites which, especially in towns, were usually restricted in size and aspect, and very often irregular in shape. The disposition of an adequate staircase in the least possible space was one very important test of skill in house-planning, but this was a kind of skill in which modern French architects excelled. The skill in planning shown by Sir Charles Barry, Mr. E. M. Barry, Mr. Street, and Mr. Waterhouse having been remarked upon, and reference made to the plans of the great public and municipal buildings erected by those distinguished architects, the lecturer referred to the skill in domestic planning shown by the late Mr. George Somers Clarke. Modern requirements, he went on to point out, had created many occasions for the architect to distinguish himself by ingenuity and contrivance in planning the various institutions, schools, colleges, &c., which had been erected and were being erected on all hands. In some of these public and semi-public buildings, such as prisons, workhouses, &c., and in private buildings, such as factories, warehouses, &c., there would at first sight appear to be little scope for studying anything but utility, but, although in many such buildings ingenuity in planning had been divorced from artistic treatment, there were many others in which the two were combined. There was no royal road to planning. Success in it was only to be obtained by repeated efforts. No man was by nature a good hand at a plan. It was essentially an artificial accomplishment, which, like swimming or riding a bicycle, had to be acquired. In conclusion, the lecturer urged his hearers to endeavour to form a proper estimate of the value to an architect of the power to plan. There was, indeed, little danger of exaggerating the value of the plan as an element in architectural design, for it was impossible to arrive at a good design in any other way than by making a good plan. As he had said at the outset, the plan was the foundation of every architectural design, hence the necessity that the architect should take thought to make the plan a good one. The effect of the superstructure would depend upon his knowledge in acquiring architectural details, and upon his success in properly using them.

THE DRAINAGE AT FRANKFORT.

Sir,—The description of the drainage of Frankfort-on-the-Main, which appeared in your issue of September 23 [p. 388], would, I have no doubt, be interesting to many of your readers, but to some of them it would, I imagine, seem strange that no mention was made of my name in connexion with it. The facts used in the article are taken from the report of Mr. Lindley, of May, 1877, and if the author of the article had translated the introductory paragraph to the statistics he has used on page 2 of the report (copy of which I enclose herewith) it would not have been necessary for me to trouble you with any explanation. I have no wish to enter into any controversy, and would have preferred asking the writer of the article to correct the omission, of which, from a want of knowledge of the full history of the works in question, he has probably unintentionally been guilty. The Commission alluded to in the article consisted of four engineers, namely, Messrs. Blonden, Eichberg, Lindley, and Wiebe, and the eminent sanitarian, Dr. Varrentrapp, their report being in favour of a system of sewerage, the leading features of which were entirely different to those of the scheme which had been prepared by the city engineer of that date, Mr. Eckhardt. Two years later, Mr. Lindley, sen., was asked to undertake the chief or consulting engineership of the work, which he did, on the condition that an acting engineer was appointed to work out the proposed scheme in detail. I was appointed to that position, and Mr. Lindley and myself entered into separate agreements with the Senate of Frankfort on January 5th, 1866, at equal salaries of 600*l.* each, Mr. Lindley undertaking to visit Frankfort two or three times a year, while my duties were to work out the scheme and correspond with him thereon, as occasion required. An office was established, and I entered upon the duties in the following April, supported by able German assistants, placed at my disposal by the authorities.

General plans, sections, and details were proceeded with as rapidly as possible, and contracts issued for materials, it having been determined to provide these for contractors undertaking the execution of the works. Details were published for all ironwork, stoneware, and other articles required, and subsequently drawings showing generally the character of the details of the works, all of which will be found to be signed by Mr. Lindley and myself, and are well known by many eminent engineers in this country, as well as on the Continent. Advertisements were issued from time to time in your valuable paper, inviting tenders, and a reference to them will bear out what I am now stating.

In 1868 I drafted regulations for the private drainage, which embraced some suggestions of Mr. Lindley's, and had, at the request of the magistrates, owing to the strong opposition met with on the part of local builders, eight sheets of drawings prepared to illustrate more precisely what was required. These regulations and details, which I was anxious to make as perfect as possible according to the ideas I then entertained (but which I had not been able to fully carry out in England), were approved by Mr. Lindley and published by the authorities, bearing his signature and mine, and have not been substituted by any other that I am aware of, up to the present time, except that the Town Council have modified their stringency on one or two points,—notably in reference to the original requirement of extra trapping of house-drains outside the house, and utilising of the whole of the available fall.

One of the first things I thought desirable when the works were commenced was the continuous testing of the cement (alluded to by your contributor) as being most important and necessary where it had been determined to build all brickwork with that material. As Mr. Grant had done in London, so the testing under my directions (for which a man was specially appointed, and did nothing else) led the way to the general testing of this material, now so prevalent, well regulated, and scientifically carried on all over Germany.

In the beginning of 1869 I prepared a statement of the cost of the works executed and an estimate of the cost of those remaining to be carried out, showing a total expenditure amounting to 330,000*l.* for the whole scheme, and this was aproved in February by Mr. Lindley, then, if I remember rightly, in Pesth, and submitted to and sanctioned by the Board of Works and the Town Council in the following June, and will be found signed by Mr. Lindley and myself in No. 16, volume ii., of the published Proceedings of the Town Council for 1869.

There was no such firm as Messrs. Lindley at that time, the sons now practising as a firm being then much too young, not having, in fact, I believe, left school when these works were commenced. I have not the remotest intention that anything I may say should be construed to detract from the position which Mr. Lindley's sons have since so rapidly attained, but think that it is exceedingly unfair that a work on which I spent the best years of my life with a devotion and determination to make it what it is acknowledged to be by all who have had the opportunity of seeing and studying it, should be accredited entirely to those who are only entitled to a share of whatever credit is due to its authors.

I retired from the works in October, 1873, after having devoted seven years and a half thereto, and the most difficult of them were completed under my immediate directions at a cost, up to that period, of 172,000*l.* Mr. Lindley retained the chief engineership, while Mr. Hallenstein, now carrying out the works I designed for Munich, and who had been engaged on the Frankfort works from the commencement, remained as chief of the office-staff. Mr. Lindley's eldest son then entered the office, and subsequently, on the retirement of his father, about two years and a half ago, succeeded to the chief control, and continues to carry on the works on the old lines, and to extend them as the rapid increase of the city requires it.

This, I believe, is something like the true history of the engineership of these now well-known works, and I cannot but suppose that neither Mr. Lindley, senior, nor his sons, who are now also occupied with other works on the Continent, would wish to ignore the part I took in connexion with them.

I could have wished to say something about the works themselves, but must defer that to some future occasion or other opportunity; at the same time I quite expect that, if the description of them as given in the *Builder* is carefully looked into by English sanitarians, they will be inclined to criticise two points on which the works differ so widely from English works of the present day, viz., that of the direct connexion of the house-drains and admittance of all rain-water. These two points alone open up a wide field of discussion, and I am afraid there would be little hope of an agreement of opinion on the Frankfort works in reference to them. I feel sure of one thing, however, that no works will be found to be better ventilated, this essential feature of all good sewerage systems having been carried far beyond anything I am acquainted with elsewhere; and I should very much doubt whether the same amount of control over the works of private drainage as has been exercised in Frankfort has been accomplished in other towns, except some few on the Continent which have taken the Frankfort regulations as their basis, namely, Düsseldorf, Crefeld, Stuttgart, Munich, and Dortmund, with the two first of which Mr. Lindley was connected as consulting engineer, and the writer in that capacity with the three latter.

J. Gordon, Mem. Inst. C.E.
Borough Surveyor, Leicester.

Sir,—After reading the admirable article in the *Builder* of September 23rd, I was very much disappointed that the author of it did not mention Mr. Gordon's name. I feel sure, if Mr. Lindley had been aware that the paper was going to be published, he would have insisted that Mr. Gordon's name should be coupled with his own, as it always has been in the published plans and papers connected with the undertaking.

During the construction of the Frankfort sewerage works, professional matters called me five times to Germany; and on three of my visits I passed through Frankfort, viz., in September and November, 1870, and in March, 1872, and I then had the pleasure of thoroughly examining the sewerage works.

Knowing Mr. Gordon as I do from the time he commenced his professional career, I can speak confidently of the ability and untiring energy which he has always thrown into any work he may have had in hand; and in no work he has ever undertaken did he display more ability and greater energy than on the Frankfort sewerage works.

Robin Hood, so the tale goes, would not have a man who could not in some points beat him, and the credit given to Robin Hood's men does not detract from his own fame.

I believe Mr. Lindley, whose name is so deservedly well known, will be as proud to see honour done to those with whom he has worked in perfecting this sewerage scheme.

H. U. McKie,
City Surveyor, Carlisle.

HASTINGS AND ST. LEONARD'S INFIRMARY COMPETITION.

Sir,—Will you allow me, through your columns, to request the competitors to favour me with their names preparatory to concerted action in regard to the above matter. I would especially request it of "Fair Play" and your other correspondent. Letters should be addressed to Box 001, Office of "The Builder."

A Competitor.

FERNERY.

Sir,—Having built a fernery composed of a quantity of petrified marl, called "tufa," from Derbyshire, I am desirous of constructing some tanks of the same to hold fish. I have tried Portland cement, which cracks and gives way. Will any one suggest a means? Would clay puddling, and cement on top, do?

D.

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BUILDING NOTES FROM THE WEST.

The Bristol General Hospital has just been closed for extensive alterations and repairs. The immediate cause of this step was the faulty arrangement of some of the drains connected with the institution, and a committee having been delegated to see what should be done, consulted Mr. Eassie, of London, who reported to them that, from a variety of causes, but chiefly from the direct communication of the drains with the public sewers without any ventilation, the house was full of sewer gas. He also pointed out that the water supply came from cisterns which were used for the purpose of flushing the closets, and expressed an opinion that from a sanitary point of view the building was in a dangerous condition. A thorough alteration of the drainage system was decided on, and an alteration in the mode of supplying the house with water. This necessitated closing the hospital, and it was determined at the same time to improve the ventilation of the wards, and to lay the floors with wood instead of cement, as at present. On the latter point there was some time ago a great difference of opinion, and the faculty of the institution, who then had not votes on the Board of Trustees, strongly opposed the use of cement for flooring. In part of the house, however, cement was laid down, and the committee, on which the medical staff have since been given votes, decided, though not unanimously, to lay the whole of the flooring of wood specially prepared with paraffin. Other smaller items are also to be attended to before the institution again opens its doors for the reception of patients. The estimated cost of the works is between 6,000*l.* and 7,000*l.* A member of the committee having called attention to the fact that the contract was to be given without tenders to a London contractor, the Bristol Master Builders' Association has entered a protest against this mode of procedure. The letter of the secretary to the Association said: "That a London contractor and his workmen should be appointed to do the work if he obtained it by fair competition would have provoked no feeling on the part of the tradesmen here, but what we do complain of is the fact that this appointment has been made without giving the tradesmen of Bristol the slightest chance of competing for the work, and this in the face of the knowledge the authorities must have that contributions and subscriptions, both from employers and workmen, form no mean part of the income of the institution."

At Bishopsworth parish church, in memory of the late Mr. Thos. Maynard a stained-glass window by Messrs. Wailes & Strang (Newcastle-on-Tyne), and a font by Mr. Frank Bell (College Green, Bristol), have just been erected. The subject of the window is the Crucifixion, and the treatment is that of elongated medallions on a rich mosaic ground, surmounted by a border of similar design. The font is of Norman design.

Messrs. Budgett's new business premises in Bridewell-street, Bristol, are lighted by electricity, supplied by the Great Western Electric Light and Power Company, Limited. This company has recently purchased premises in the centre of Bristol as the headquarters from which to supply electricity. Messrs. Budgett are their first customers, and when their order is carried out their premises will be illuminated by over a hundred Lane-Fox incandescent lamps and four 2,000-candle Brush lamps. At present, pending the fixing of the Lane-Fox apparatus, twenty or thirty of the arc lights are in use, and work very steadily.

The electric light at the new East Dock at Swansea is now in full work, and every evening when vessels can enter and leave the dock brightly illumines the entrance locks and basins. Five 2,000 candle-power Brush lamps are used, and are driven by a No. 5 Anglo-American dynamo machine fixed 400 yards off, the wires being taken underground. An eight horse-power engine supplies the driving-power.

The tender of Mr. W. Veales, 4,234*l.*, has been accepted by the Bristol Docks committee for the erection of sheds at Prince's wharf. The other tenders were Mr. A. J. Beavan, 4,262*l.*; Mr. Ressiter, 4,408*l.*; Messrs. R. & J. Davey, 4,549*l.*; Mr. Church, 4,561*l.*; Messrs. Lewis & Edbrooke, 4,568*l.*; Mr. G. Humphries, 4,574*l.*; Messrs. Stephens & Bastow, 4,593*l.*; Mr. Krauss, 4,713*l.*; Messrs. Howell, 4,722*l.*; Mr. Cowlin, 4,750*l.*; Messrs. Brock & Bruce, 4,766*l.*; Mr. Easterbrooke, 4,945*l.*; Mr. Walters, 4,965*l.*; and Mr. H. A. Forse, 5,040*l.*

It is stated that Mr. J. Lysaght, of the St. Vincent Ironworks, is about to erect spelter works near Bristol, thus reviving a once important but long absent industry.

Combe Down Church is about to be improved and enlarged at an expense of 2,000*l.* The proposed enlargement will consist of two aisles, a chancel, and chancel aisles, and it is also intended to reseat the church.

The new Church of St. Peter, Clifton Wood, Bristol, was opened on the 26th of September. The building takes the place of an old and inconvenient one close by. The style is Early Gothic, of a substantial character. The nave is 83 ft. 2 in. long by 39 ft. 7 in. wide; and the chancel, which has a circular apse, is 30 ft. 6 in. long by 27 ft. wide, the total length of the building being upwards of 113 ft. One of the aisles is 65 ft. 8 in. by 13 ft. 8 in., and the other 81 ft. 2 in. by 13 ft. 8 in. The tower, 20 ft. square, is 65 ft. in height, and has a handsome freestone turret. The walls are of Pennant stone, in random-range work, with Bath stone dressings for the windows and doors, and Draycot stone arches. A spire will be erected when funds permit. The nave and aisles are roofed with Broseley tiles. There are three entrances; the principal one, at the south end, (the site necessitated the church being built north and south), is a bold arch of Bath stone, heavily moulded, and enriched with handsome cuspings. On the east side of the chancel, to utilise a corner of the site, a chapel has been erected, which gives increased accommodation. On the other side, a corresponding wing is used as an organ-chamber, and both the chapel and organ-chamber open into the chancel with boldly-constructed arches of freestone. The nave and aisles are divided by four freestone arches, with handsome moulded caps and bases, and sanded Mansfield octagon piers. The building will accommodate 1,000 persons, and has cost about 8,000*l.* Mr. R. J. Crocker, of Bedminster, was the general contractor; Messrs. Bell & Sons had charge of the stained-glass windows; Mr. Frank Bell executed the carvings; Mr. Wood erected the pulpit; Mr. Singer, of Frome, the brass lectern; Messrs. Gardiner & Sons, Bristol, the heating apparatus; and Messrs. Priest & Son part of the ironwork. The architect was Mr. Vincent W. Voisey.

RUSSIAN NEWS.

About half-way down the Nevsky prospect, on the left hand as one turns one's back upon the Neva, is the fine Catherine-square, as those who have seen St. Petersburg will well remember. At the end opposite the Nevsky stands the Alexander Theatre, and the two other sides are faced respectively by the long façade of the public Library and by the Czarewitch Palace.

In the centre stands a fine bronze monument of Catherine II., and around and below the figure of the empress are grouped the celebrated persons whom she delighted to honour. At the corners of this square it has now been decided to erect statues of four prominent personages of this sovereign's reign, and models for these monuments are now being prepared in the St. Petersburg Academy of Arts.

Several of the Imperial palaces built by former sovereigns, but now never used by the Imperial family, are to be given up to public uses. One of these residences, built for Alexander I., at Taganrog, will be arranged to receive the town library and an interesting museum of local antiquities, which sadly needed housing.

Fires are unhappily at all times common enough in Russia; the magnitude of some of the recent ones, however, and the vast destruction of property which has resulted from them, seems to have awakened the attention both of inventors and of public bodies to the necessity of taking every measure possible to avert or diminish this evil, to which Russia is particularly subject. The local Council of the St. Petersburg Government have assigned a considerable sum for the establishment of model rural fire stations, upon the pattern of those founded by the Moscow Society of Rural Economy, and every effort is to be made to get the rural communes to adopt similar institutions.

The municipal authorities of St. Petersburg have issued an order which makes it compulsory upon the proprietors or lessees of all theatres, music-halls, and places of entertainment, to coat all side-scenes, curtains, properties, costumes, and other scenic accessories with the incombustible paint of MM. Spyeshnyef and Melgounof, or some similar composition. This is to be done within the period of six months from the publication of the order, and neglect of the precaution renders the delinquents liable to prosecution. It is added, in a mollificatory way, that now smoking in green-rooms and behind scenes will be free from danger, as burning cigar-ends, &c., cannot cause the ignition of materials covered with these preservative paints.

It is reported that a contract has been agreed to with an American firm to light all the theatres under Government management by electricity.

A recent number of the *Inzynierja i Budownictwo*,—a periodical devoted to engineering and construction, published in Warsaw,—contains a description and drawings of an automatic apparatus for extinguishing fire and signalling its outbreak, which has been invented by a mason, M. F. Balv. The apparatus begins to act automatically under the action of fire, and at the same time signals the fire at the fire-station with which it is in communication. The apparatus is comparatively simple in action, and does not require a very large quantity of water.

The cost of the new University about to be established at Tomsk is definitively estimated at 1,220,000 roubles. The requisite buildings will, it is considered, be completed by the year 1885.

It is anticipated that the whole of the scaffolding which has so long shrouded the Isaac Cathedral in St. Petersburg will, before long, be entirely cleared away, and the church exposed to view. The work of covering the walls with thick marble slabs is to be resumed next summer. The renovation of the large picture of the "Fall and Expulsion from Paradise" is already nearly completed. The mosaic decoration of the interior is said to be proceeding successfully. Eight pictures of saints are at present being treated in this way, and will probably be finished at no distant date.

With regard to the higher education of women, Russia has for many years been entitled to a high place among European nations. The higher courses for women in St. Petersburg, and those in Moscow initiated by the well-known Professor Guerier, justly enjoy a high reputation. A retrograde step has, indeed, been recently taken by the exclusion of female students from the higher medical courses in St. Petersburg. The organisation of a museum of the products of female labour is just now occupying attention in Moscow, and appears to have a fair chance of a successful issue. Many objects exposed in the national exhibition, which will close on October 13, will be devoted to this museum. Funds were left by the late M. Ponomaref for an analogous purpose; as, however, the testator committed suicide, the decision of a legal tribunal is awaited as to the disposition of the bequest.

Frequent attempts have been made to establish steam locomotion upon the ice which covers the Neva and a great part of the Gulf of Finland during winter. It cannot be said, however, that these efforts have hitherto been crowned with what may be regarded as anything like a secure and remunerative success. Last year indeed steam communication was established for a short period between Oranienbaum on the mainland on the southern side of the gulf and the island port of Kronstadt. Attempts, however, to employ the ordinary railway appliances upon the ice have proved more or less failures. Quite recently, M. Vradig has devised a kind of engine for use upon ice, by the employment of which metal rails may be dispensed with. M. Vradig has been negotiating with the St. Petersburg Town Council with a view to establishing his system of locomotion upon the Neva and its estuary during the ensuing winter. It is understood that the Prefect of Police has advised the Town Council that there is no objection to locomotion by steam upon the ice.

Ventilation.—Messrs. Robert Boyle & Son's system of ventilation has been selected by the Committee and Architect for the ventilation of "Lloyds," Royal Exchange, to which it is being at present applied. Messrs. Boyle's system is also being applied to Claremont, the residence of H.R.H. the Duke of Albany, and has been adopted for the ventilation of Portland Prison.

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DAMAGE TO LEAD PIPES BY RATS.

In the cellar of a house in Berlin, a large number of rats had recently taken up their permanent abode. Notwithstanding traps and poison, the vermin could not be got rid of. The brickwork was carefully examined, and a good many holes were discovered, which probably served as nests for the rats or led to the outside soil. All the openings were filled with cement, and the walls of the cellar pointed. The floor, which had hitherto been loose, was laid with bricks in cement. The rats disappeared; but after a short time a wet spot was observed in the brickwork, near where the water supply pipe ascended. On examination, a number of dead rats were found in a space of the cutting made for the pipe which had not been filled up when the pipe had been moved, and, close by, the lead pipe had been gnawed right through. The above may be very easily explained. A family of rats had settled in the cutting; exit had been cut off by the closing up of all the holes; the rats, trying to get out, had attacked the lead pipe as being the softest material in their prison. They gnawed until they had made an opening, when they were drowned by the outflowing water. It may be of use to mention here that lead pipes may be efficiently protected against attack by rats or oxidation by winding well-tarred canvas round them, and afterwards applying another coat of tar.

WORKMEN'S VIEWS AS TO THE PATENT LAWS.

At the recent Manchester congress of trade unionists, Mr. W. J. Davis moved:—

"That this Congress again expresses its strong disapproval of the continuance of the unjust patent laws, which tax intellect unduly, and act to the disadvantage of the mechanic, who, generally unable to secure the benefits of his inventive capacity, is compelled to remit his right of originality; also regrets that the President of the Board of Trade has been unable to introduce his promised Patent Bill, and trusts that the Government measure will remove anomalies of which poor inventors so justly complain; and, further, this Congress instructs its Parliamentary Committee to watch both the Government and private measures, and to use every exertion to obtain equitable provision to all classes of the community."

He said if the patent laws of this country were compared with those of others, a great difference would be seen to exist. In England when a man brought out an invention he had to pay 25*l.* within the first six months, and 50*l.* seven years afterwards. Thus, whilst an invention cost 75*l.* in England, in France the fees were only 16*l.*, Germany 16*l.* 10s., Austria 10*l.*, United States 7*l.*, and Belgium 4*l.*, which conclusively proved that English artisans laboured under a great disadvantage to those of other countries. It often happened that a struggling inventor in Great Britain, finding he could not pay the 50*l.* at the conclusion of the seven years, sold his invention for a mere song to a capitalist, who traded upon it, and probably made a fortune; and this state of things was highly undesirable.

Mr. Threlfall (Southport) seconded the resolution.

Mr. Evans (Manchester) said he thought the law was one of the most unequal that an ingenious labourer had to contend with, and the sooner it was done away with the better. He could not understand why the law should be allowed to remain such a drag upon the intelligence of a workman. He heartily endorsed the endeavour which was being made to get the matter rectified. He only regretted that the machinery required to be put in motion was of such a cumbrous character. It was not very creditable to our legislature that gentlemen like Mr. Broadhurst, and others, who represented them in the House of Commons, had such great difficulty in obtaining a hearing upon such practical questions as these, and it was the duty of working men especially to support them in their efforts to bring about a remedy.

Mr. Drummond said that in Glasgow they had given their support to Mr. Anderson's Bill, and he thought that Congress would unanimously approve the motion now before it.

Mr. Evans (London) said he had received communications from twenty-six working-men inventors who were unwilling to exhibit their inventions at the Railway Safety Appliances Exhibition at Darlington, as they had not the means to obtain patents. Besides the great cost of taking out a patent, inventors had to contend with patent agents, whose charges were almost equivalent to a second patent-tax.

The resolution was carried unanimously.

THE NEW PUBLIC HALL AT BATTERSEA.

The new public hall which is to be erected at the foot of Lavender-hill, immediately adjacent to Clapham Junction Railway Station, by the Battersea and New Wandsworth Public Halls Company, is to be commenced at once. The first meeting of the company was held last week, when it was stated that the plans and specifications were all ready, and that the directors had received eight tenders from different builders, ranging from 12,430*l.* down to 9,560*l.*, the lowest tender being that of Messrs. Holloway, of Lavender-hill, and this tender was accepted. The foundation-stone of the building is to be laid in the course of the ensuing month by Mr. Sydney Stern. The site of the intended building is at the corner of the Lavender Sweep Estate, on which a large number of new houses are now in course of erection. It will have two bold and prominent frontages, one facing Lavender-hill and the other St. John's-road, Battersea-rise.

PROVINCIAL NEWS.

Birmingham.—Birmingham is about to receive an addition to its charitable institutions. In connexion with the Wesleyan "Thanksgiving Fund," which has now reached a total of nearly 304,000*l.*, Mr. Solomon Jevons made an offer to the committee that if from the fund they would make a grant of 10,000*l.* towards establishing an orphanage in the neighbourhood of Birmingham, he would supplement it by a donation of 10,000*l.* After due consideration the offer was accepted. Plans were prepared by Mr. J. L. Ball for as much of the building as it is proposed immediately to erect, and after tenders had been received from ten of the prominent building firms of the district, the contract has recently been let to Messrs. J. Wilson & Sons, Handsworth. The sanction of her Majesty the Queen has been obtained to call the building the "Princess Alice" Orphanage, in memory of her lamented daughter, the late Princess of Hesse. A site has been selected on the Chester-road, about equally distant from Erdington and Sutton Coldfield, and close to the Beggar's Bush. The arrangement of the orphanage buildings will be such as to give the idea of a village rather than that of a public institution. Facing the Chester-road, at a distance of about 130 ft., will be an irregular line of buildings, altogether nearly 250 ft. in length, which may be regarded as the administrative block, consisting of the master's house, the offices and Board-room, the belfry and great hall, the kitchens, store-rooms, bakehouse, and kitchen offices. These buildings, though of varying heights and outlines, are connected. The most important is the great hall, 90 ft. by 33 ft. and about 20 ft. high, intended to be used not only as a dining-hall, but also for the daily morning prayers, for general gatherings, and, until the chapel is built, for divine service. Behind the administrative buildings, on the right hand and on the left, the cottages or "homes" will be placed irregularly and at varying intervals. When complete, there will be twelve cottages for boys, and twelve for girls, each providing accommodation for about twenty-five children, together with matron's rooms. These farm-cottages will stand detached in separate plots of ground, and will be of different designs. Schools, workshops with facilities for carrying on about a dozen industries, baths, farm buildings, and a farm bailiff's house will be built on various parts of the estate, and the little colony will be completed by a chapel.

Nottingham.—The *Nottinghamshire Guardian* says that lovers of the picturesque in the quaint Old English style of architecture prevalent in our oldest towns will soon lose a well-known specimen, recently dignified by the name of King John's Palace, situate in Bridlesmith-gate, Nottingham. The whole of the premises known as the "Palace," and the old oaken-built structure known as Rose-yard, are now being pulled down to make way for other buildings to meet modern requirements. The proposed new buildings, which are to be erected from the designs of Messrs. S. Dutton Walker & Howitt, are, in style, to follow the semi-timbered framing of the ancient structures which formerly were so frequently seen in our streets, but which are now nearly all swept away. The building about to be removed is mainly constructed of oak framing, owing, no doubt, to the contiguity of Nottingham to Sherwood Forest. In the interior much of the quaint old work has been demolished, especially on the ground-floor, but the upper rooms are all wainscoted with oak panelling,—of course painted, as usual by the Goths and Vandals, with beautiful stone colour. On removing part of the wainscoting, Mr. Walker found in several rooms some very interesting stencilled decoration. Photographs have been taken to preserve some record of the old structure.

Heaton Mersey.—Mauldeth Hall, Heaton Mersey, was on the 15th ult. opened by the Bishop of Manchester as a hospital for incurables. The building was formerly occupied as a mansion by Mr. W. Romaine Callendar, from whose executors it was bought for the sum of 15,000*l.* It stands in well-wooded grounds, with gardens and lawns, and may be described as palatial. It is of Classic architecture, with frontages of Yorkshire stone. A wing has been added, and the interior altered and improved, the total cost of the additions and alterations amounting to 8,000*l.*, making a grand total of about 24,000*l.* The architect is Mr. Charles Heathcote, Manchester; and the builders, Messrs. Wilson, Toft, & Huntley, City-road, Manchester. Bishop Fraser, in the course of the proceedings, said the building, in its original shape, once belonged to him. The last bishop selected it as a suitable house for the Bishop of Manchester. He (the bishop) did not think it was suitable, and he absolutely refused to live there. For two years the building was a considerable burden to him. The Ecclesiastical Commissioners would not allow him to part with it until he got a house in its place. By good fortune he did get another house, and in 1873 was relieved from his responsibility. Mr. W. Romaine Callendar bought the property from the Ecclesiastical Commissioners, and spent a considerable sum of money in ornamenting and enlarging the house, but, unhappily, was spared only a few years afterwards to live in it. The building had thirty acres of land belonging to it, including some admirable gardens, which were now let out and produced an income of 200*l.* a year. By the taste and skill of the architect, the building had been enlarged and adapted to its present purpose.

Accrington.—On the 16th ult. the new Conservative Club at Accrington was opened. The building is situate at the junction of Blackburn-road and Eagle-street, nearly opposite the Railway Hotel, and close to the railway station. The entrance is in the Blackburn-road façade. Ascending four stone steps in the outer vestibule, the inner hall, 8 ft. wide, is reached. On the left, towards Eagle-street, is the news-room, 24 ft. by 20 ft., lighted from Blackburn-road and Eagle-street, and fitted with newspaper desks, tables, and furniture. This room has an enriched ceiling, and is surrounded by a dado lining, 4 ft. high. Beyond this room, on the same side, is the billiard-room for first-class members, 25 ft. by 20 ft., lighted from two sides, and fitted with permanent seats on one side and one end. On the right of the hall is the smoke-room for first-class members, lighted from Blackburn-road. This room is furnished by Messrs. Kendal, Milne, & Co., of Manchester, who have supplied most of the movable furniture. At the extreme end of the hall are the lavatory and offices. The floors of the hall and vestibule are paved with encaustic tiles from the works of Messrs. Maw & Co., Broseley. The principal rooms on this floor are 14 ft. 6 in. high. On the right of the hall are also the servery and porters' kitchen. On the first floor to the right is the large billiard-room for second-class members, 48 ft. by 20 ft., lighted from the two main fronts and from the roof. This room will contain two billiard-tables, and is fitted with permanent seats. In connexion with this is a smoke-room, 20 ft. by 9 ft., lighted from Eagle-street. Over the front lobby is a dining-room, 15 ft. by 8 ft., lighted from Blackburn-road, and in communication with the balcony fixed over the entrance gateway. To the left of this is a large committee or lecture room, 22 ft. by 20 ft., calculated to seat about 130. The wrought-iron gates, gasfittings, and railings are

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by Messrs. Dutton & Powers, of Manchester. The internal joinery is executed in Baltic timber, selected pitch-pine being used for panels, and all stained and varnished. Externally, the walls are built of Yorkshire stone, the ashlar being from the Ringby quarries. The style of the building is Domestic Gothic. The architect is Mr. Henry Ross, of Accrington.

Lancaster. — Extensive alterations and improvements will be made to the Palatine Hall early next year. The Committee of Trustees have adopted designs prepared by Mr. Geo. D. Oliver, of Carlisle and Workington.

ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.

A Northern district meeting of the members of the above association was held in the Town-hall, North Shields, on the 27th ult., under the presidency of Mr. J. G. Lynde (Manchester). The advisability of reviving the adjourned discussion of the paper on "Private Improvement," read by Mr. Hall, of Stockton, in April last, was the subject of debate. It was resolved that the consideration of Mr. Hall's paper be deferred till the next district meeting. Mr. P. W. Thompson, hon. local district secretary, Willington Quay, read a paper on "The Operation of the Canal Boats Act," written by Mr. E. C. Buchanan Tudor, engineer and surveyor to the Goole Local Board, who was unable to be present. It stated that when the Act of 1877 came into operation there were upwards of 1,000 boats, commonly called keels, trading through the port of Goole, the whole of which were used as dwellings, and required legislation. The cabin space was almost in every instance too limited for the number of people inhabiting it; the means, if any, adopted for ventilation were insufficient, and the arrangements for the fittings were defective. The sleeping accommodation was rarely, indeed, what could be desired or deemed even decent, and frequent occurrences of overcrowding and immorality prevailed. He thought that a systematic periodical inspection of the boats would be a practical improvement. The effective and beneficial working of the Act must always to a certain extent depend on the industry, zeal, and knowledge of those appointed to carry it out, and his opinion was that if these officials were appointed by Government for combined districts, rather than by local authorities, constant supervision would be maintained. In the discussion which ensued, a unanimous opinion was expressed that the last suggestion was an important one worthy the consideration of engineers and surveyors. The meeting closed with votes of thanks to Mr. Tudor for his paper, and to the Mayor and Corporation of the borough of Tynemouth for their courtesy in placing the Town-hall at the disposal of the association. The members afterwards visited the Coble Dene Dock, the Piers Works, and the North-east Coast Exhibition.

THE MUNICH ELECTRICAL EXHIBITION.

Though perhaps not such a brilliant display as the Paris Electrical Exhibition, that of Munich is, from a scientific point of view, of exceptional value, more particularly from the fact that metric and other instruments of quite recent invention are shown, which facilitate the estimation of the power and consequent value of any dynamo-electrical machine. In this manner calculations are rendered much more simple as to the cost of the electric light, respecting which there has been hitherto a want of means of arriving at an exact idea of the expense it entails.

There are no less than twenty-two steam-engines at work for the purpose of furnishing the motive power required by the electric light in the exhibition; there are also several gas engines. A remarkable instance of the transmission of force is furnished by the over-ground copper-wire communication, which renders available for the working of several kinds of machinery the water-power at the Maffei machine-factory at Hirschau, three miles distant, and in a similar way there is a transmission of power effected from Miesbach, which is at a distance of thirty-one miles. The transmission of sound affords visitors the opportunity of hearing music which is being performed at a distance. Special prominence is given to the discoveries of Edison, to which a special department in the exhibition is devoted.

Amongst the other specialities of the exhibition is a photographic gallery, in which electric illumination is utilised both for the taking and copying of photographs. A model on a large scale of a railway, with two termini and an intermediate station, exemplifies in a lucid manner the system of railway telegraphy. An instrument, entitled the Glossograph, registers in an automatic manner spoken words, and though not at present in a complete form, it is, nevertheless, an interesting exhibit.

The electric fire-alarm is shown in connexion with the protection of buildings from the ravages of fire, and lightning-conductors also form appropriate objects of exhibition. The financial results of the enterprise seem to have been so far of a satisfactory character.

JOTTINGS FROM THE NEWCASTLE HEALTH CONGRESS.

In the section devoted to Chemistry, Meteorology, and Geology,

Mr. G. J. Symons read a paper, prepared by Mr. H. C. Bartlett, Ph. D., F.C.S., "On the Influence of Minute Suspended Matter on Health: its detection, collection, and examination." He said pollutions of the air were frequently diffused in a gaseous form, and required great delicacy of chemical investigation to estimate the proportions in which the gases might be taken up by the atmosphere, and in what proportions such gases must be deemed injurious to health and life. Men worked in breweries, soda-water factories, and gasworks without loss of health from breathing offensive gases, while people in crowded buildings often suffered from headache and depression. He had, therefore, been forced to the conclusion that the serious and even dangerous effects of bad ventilation were mainly due to matters carried in the air not in a gaseous form, but suspended as minute particles. It had been ascertained many years ago that solid particles of matter, either inorganic or organic, living or dead, were suspended in the air, and practically these same particles might be found in suspension in almost all drinking-water open to the air.

Mr. Symons also read a paper on "The Improvement of Climate with Slight Elevation," which had been prepared by the Hon. F. A. Rollo Russell. He showed that repeated observation had proved that at points artificially or naturally raised above the surrounding district the range of temperature was smaller. The practical conclusions seemed to be that invalids and delicate persons would generally be best placed in high-sheltered situations, in the highest rooms of a house, and by no means on a ground-floor; that a climate resembling that of the seaside, but less damp, could be obtained by living at the top of a high house; that every house ought to be built on arches, or thoroughly ventilated below and raised on piers above the ground level, and that no house or cottage which is not ventilated underneath, with damp-proof walls, should be considered habitable; and that in the country no house should be considered habitable of which the floor is on a level with or below the ground.

A paper by Mr. R. Carr-Ellison on "The Influence of the Purity or Impurity of the External Atmosphere on Public Health, Public Comfort, and on Domestic Habits of the People," was read in his absence by his son, Mr. Edmund Carr. He said that on Tyneside such was the cheapness of coal that it had always been used with a most lavish and wasteful profusion. The discharge of densely-opaque smoke from the chimneys of furnaces, factories, breweries, and the like, in vast volumes after every replenishment of fuel, was the rule and not the exception. There was, however, one honourable and distinguished exception, — that of Sir William Armstrong & Co., at Elswick,—where a vast business was conducted with as little production of smoke as possible, and with corresponding economy of fuel. The smoke pall which hung over Newcastle and Gateshead from Monday morning till noon on Saturday was fearful to behold, and had a decided effect upon the ventilation of even the best class of dwelling-houses in the two towns. He strongly advocated that the local authorities should take steps to stop the disgraceful cloud of smoke so often seen in the district.

The chairman (Dr. Arthur Mitchell, F.R.S.) said he did not suppose there could be a doubt that the smoke of a town had an unwholesome influence upon the health of the people, and it had been proved that by mechanical arrangements they could get quit of it, but the law to suppress it was not applied. He did not think that attention could be too often directed to a subject of this kind, which was of public interest; but, for the reasons which had prevented the discussion of other papers, he proposed that they should receive the paper without discussion, and that they should record a vote of thanks to Mr. Carr-Ellison for communicating it.

Mr. R. B. Grantham read a paper "On the Establishment of a Library for a special Branch of Sanitary Information at Newcastle." Having for some time taken a practical interest as an engineer in the execution of sanitary works, he had become impressed with the necessity which existed for a collection of the numerous reports and other authoritative publications on the subject, and he was desirous of suggesting that a special library of such works be formed at Newcastle for reference, and as a means of promoting the study and diffusion of sanitary science. He had made a small collection, which he was willing to place at the disposal of the Scientific and Philosophical Society as the nucleus of such a library, and he had added a list of works which he considered might be proper to include in the collection. These would, however, be inadequate to carry out his views, but he wished to intimate that many of the learned societies would, upon application, furnish copies of their publications, reports, &c., upon the understanding that a really representative collection would be formed and efficiently maintained for purposes of reference and as a means of information to those who were desirous of studying and practising sanitary science.

In the section devoted to Sanitary Science and Preventive Medicine, Dr. Lediard read a paper on "Arsenic in Domestic Fabrics." He showed that large amounts of arsenic existed in wall-papers, materials used for dress, crétons for bed-hangings, carpets, &c., and that these things had a seriously injurious effect on the health of persons coming in contact with them, and were frequently fatal. He contended that a case had been made out for legislative interference. Some amongst those interested in this subject objected to the further interference with the liberty of the subject by the imposition of additional laws to prohibit the use of arsenic and other poisons in domestic fabrics, but he held strongly that laws were good if only to appeal to in cases of real necessity. Much work, he thought, still required to be done in systematically examining all and every kind of material of wearing apparel or fabrics used in house decoration; for it would be found that arsenic was present in many things apart from wall-papers, which had performed the task of calling attention to this important subject.

ECCLESIASTICAL ART EXHIBITION AT DERBY.

In connexion with the Church Congress this week in Derby, there has been held an ecclesiastical art exhibition, the special feature of which was the loan collection, numbering upwards of 400 separate exhibits. Embroidery, both ancient and modern, was largely represented, and amongst the former may be mentioned a vestment of thirteenth-century date, exactly the same as the celebrated chasuble in Salisbury Cathedral. By some chance it came into the possession of the Dutch, and was stolen from one of the churches of Holland during the Wars of Independence, and latterly was in the possession of the Archbishop of Utrecht. It is the property of Mr. W. Baker. There were numerous specimens of modern work, including sets of vestments from Prestbury, contributed by the Rev. Bagehot de la Bere; a cope worked for St. Clement's, Bournemouth, by Messrs. Cox & Co.; and an altar frontal, cope, and dalmatic, by Messrs. Jones & Willis; the two last having been shown at the Great Exhibition in 1851, when they received a prize medal. Mr. Douglas Horsfall exhibited an altar frontal, worked by Mrs. Robert Horsfall, intended for the new Church of St. Agnes, Liverpool, shortly to be erected as a memorial to her late husband. Modern embroidery was represented by specimens of the work of the East Grinstead Sisterhood.

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Metal work and enamels formed an important branch of the collection. Mr. Russell showed a good example of *champlevé* work of the twelfth century, being a plate with a representation of the Presentation. Mr. Clark's exhibit included a selection of bronze plaques, ornamented with Scriptural subjects. Mr. Malim showed the chalice and paten used at St. Dunstan's Brotherhood at Plaistow. Mr. Llewellyn Jewitt sent a pair of Russian consecrated pendants, or images for personal wear, in gold, silver, and enamel; some Græco-Roman bronze crosses and crucifixes, together with a triptych and a pectoral plate in bronze and enamel.

One of the most striking items of the collection was the model of the Shrine of St. Ursula, the original of which is at the Hospital at Bruges, and is the work of Hans Memling. It consists of a cabinet in the form of the nave of a cathedral, covered with exquisite paintings, representing various incidents in the life of St. Ursula, from the landing at Cologne to her apotheosis.

Pictorial art was represented by various photographs and chromolithographs of ancient pictures, illuminations, drawings of churches and ecclesiastical furniture, engravings of chalices, and a large collection of rubbings of monumental brasses and incised slabs.

The Rev. J. Fuller Russell sent a very interesting and valuable collection of manuscripts and early printed books. Amongst the former were included a Sarum Missal of the fifteenth century, containing elaborately-executed borders of the "English flower type," together with the usual "Crucifixion" at the beginning of the Canon.

Amateurs of ivories and wood-carving found much to admire in Mr. Henry Clark's collection, which included about a hundred examples of plaques, statuettes, triptychs, caskets, &c., mostly belonging to the sixteenth century. Mr. Watkin Williams Wynn contributed a fine ivory diptych of fourteenth-century date, probably Nuremberg work, and the Rev. F. Jourdain showed part of an ancient triptych with figures of saints, belonging to a Derbyshire church.

HAMMERSMITH BRIDGE.

At the meeting of the Metropolitan Board of Works on the 29th ult., several deputations from local authorities and inhabitants attended to urge the provision of a temporary bridge during the reconstruction of the superstructure of Hammersmith Bridge. Mr. Richardson subsequently moved:—"That it be referred to the Bridges Committee to ascertain and report whether the Board has statutory power,—(1) Entirely to close Hammersmith Bridge during the progress of the works now under contract; (2) To incur expenditure in making temporary provision for the traffic during such time as the bridge may be closed. That the committee be authorised to obtain the opinion of counsel, if it should be considered necessary." The mover observed that the agitation that had been going on during the recess in regard to Hammersmith Bridge had at any rate been the means of informing him of one circumstance of which he was not previously aware. He most certainly was not aware that *any* provision was to be made for the conveyance of the traffic across the river while the bridge was closed. He had made inquiries on the subject, and the Engineer had told them that these clauses in the specification for the provision and maintenance of a ferry were submitted to and approved by the Bridges Committee. He had endeavoured to ascertain if this was the case, but neither the clerk nor the chairman of the committee knew anything about it, and he thought he might say that this particular point was never brought before the committee at all, except that the specification was submitted for approval in the usual formal manner. So far as Hammersmith Bridge was concerned, the Board was proceeding under the Act of 1877, and the only duty or power of the Board in respect of the bridge under that Act was contained in the words, "The bridge shall be maintained and repaired by the Board." The question, therefore, arose under what authority the Board had the power to expend a considerable sum of money for the purpose of providing means of communication across the river when the bridge was closed. There was no such power given to the Board in this Act or in any other Act. There appeared to be no authority whatever, except that of the Engineer, for such clauses being inserted in the specification, and it was quite clear that the insertion of these clauses had given rise to all the excitement that had arisen. It had also given rise to the idea that the Board was responsible for the conveyance of the traffic across the river during the time that the bridge remained closed, whereas any such action would be outside the powers of the Board, and any expenditure incurred for such a purpose would be liable to be disallowed by the auditor when the accounts were examined. This was a matter in which the Board was entirely subject to the control of Parliament, and, although they were a body representing the whole metropolis, they were not allowed by Parliament any discretionary power whatever in dealing with these questions. He thought it very desirable that the Board should have a discretionary power to provide for the conveyance of traffic across the river during the time that a bridge was closed.

The motion having been seconded,

Mr. Runtz said it appeared to him altogether unnecessary. The whole subject had been referred to the Works Committee, and, if the reference now suggested by Mr. Richardson was necessary at all, it ought to go the Works Committee, and not to the Bridges Committee.

Mr. Fell moved, as an amendment, that the Works Committee be substituted for the Bridges Committee.

Mr. Richardson accepted the amendment, and the motion, altered in accordance therewith, was agreed to.

WHAT IS PROPORTION?

Sir,—Both your correspondents of last week,—Mr. Aitken and Mr. Giraud,—attribute opinions to me the very reverse of those I hold, and that I have repeatedly expressed. I have always contended that it is absolutely impossible to separate proportion, in the sense of quantitative relation, not merely from construction, but from existence. Everything in the universe exists either in proportion or in disproportion. But of those things which are proportioned to their purposes, only some are at the same time proportioned to taste. The satisfying of taste is an end in itself, and to formulate the science of the beautiful we have to discover those degrees of manifestation and those quantitative relations (proportions) which are apposite to taste. But the beautiful is neither the sole aim of nature nor of art. If the beautiful had been the sole aim of nature we should never have had to discuss the matter, for everything would then have been beautiful; but as things are constituted, we know that some, though perfectly proportioned to their special ends, are not beautiful, whilst others, equally fitted to their special ends, are coincidently apposite to taste. The hippopotamus, the toad, and the floating derrick, for instance, though perfectly proportioned to their respective purposes, do not exist in proportions agreeable to taste, whilst, on the other hand, the human form and the egg-shape exist in proportions which, at the same time that they are proportioned to their ends in creation, are proportionate to taste.

In respect to Mr. Giraud's letter, I beg to say that not a word about "habit" or "custom" will be found in my letter of the 16th ult., though I have endeavoured to show in my correspondence on former occasions that "habit" is a factor which complicates æsthetic questions, and increases the difficulty of determining those proportions that are purely apposite to taste. He also falls into the common and fatal error that taste is founded upon some arithmetical harmony, some occult harmony in numbers, or on geometrical relation. Now, the music of form, of colour, and of sound is not founded on anything of the kind, but on the laws of our own nature, on the nature of the senses of sight and of hearing. Numbers are but the symbols by which we write down, numerically express, those degrees and quantitative relations that are apposite to our sensuous nature. From this error proceeds the perennial insistance on the virtues of the regular geometrical figures. Now these are demonstrably not those figures which are most apposite to taste; these regular forms are approximated in nature only in its more elementary, material, and primordial forms; they are rarely to be found in the higher forms either of life or of art. Neither in the Grecian pediment, frieze, columniation, nor general forms do we find the regular geometrical figures, much less in that quintessence of the beautiful,—the human form.

Your correspondent forgets when he sneers at the word "æsthetic" that that word was in use when the Parthenon was built, and in the same scientific sense as at present. Its introduction is novel only to this unæsthetic race. I believe that the Greeks had a science of proportion, and that I have re-discovered and re-formulated that science. But if they had a science of formative proportion, it must have been founded in reason. If "the depth and projection of the smallest member was regulated" in Grecian architecture, as your correspondent affirms, let us know the why and the wherefore, or it must be set down as mere assertion. And if it be known why, why then we are on a level with the Greeks, and we could go and do likewise. I maintain that no one is in a position to affirm whether the Greeks were æsthetically right or wrong, unless they themselves have topped the science of proportion. Until the science of proportion be mastered we must withhold our judgment, for it is possible to be the slaves of habit in matters of taste. Without such a science, clearly worked out, it is merely bold and bald reiteration to affirm the perfection of Grecian art. In conclusion, I must most emphatically deny that I "dubbed" all those who may differ from me as half-educated. What I did say, with respect to half-education, had reference to a special form of misconception, with the correction of which, in the very opening of his letter, your correspondent concurs. One word more, and I have done. In my letter of the 16th ult., "opposite to sense," ought to have been, as may be gathered from the context, *apposite* to sense.

W. Cave Thomas.

SANDOWN CASTLE.

I have just returned from Deal, and quite re-echo the remarks of Professor Hayter Lewis a few weeks ago. The ruins of Sandown Castle should be preserved, and if they could be used for no other purpose they would form an admirable bathing-machine. For bathing, Deal is about the worst place on the coast,—the sands have all gone to Goodwin! Nothing but shingles left on the beach,—larger than walnuts, and very unpleasant to the feet. At Sandown Castle, on the contrary, bathing is very pleasant, and the old castle makes an excellent shelter. Could not the idea be improved upon? The above suggestion is not mine; it is the idea of many I saw there bathing,—old and young. The castle is a gentle walk from Deal, just beyond the bathing regulations. Might it not be included within them, so as to prevent the idea from being abused?

Deal boasts of being the oldest bathing town in England. The inhabitants tell you Julius Cæsar bathed here August 26th, B.C. 55, with his Roman followers, on their first introduction to the Britons! The Saxons and Danes subsequently frequently bathed here before having a plunge at each other! But, joking apart, Deal is a very interesting central point to spend a week's sojourn from London. Here are Deal and Walmer castles, of similar plan, date, and style to that at Sandown. Walmer Church is noticed in Parker's Glossary, and Dover is within easy reach. Inland are Upper Deal, Great Mongeham, and Northbourne, described by the late Mackenzie Walcott in his "Coast of Kent" (a little book published by Stanford, Charing-cross, which no one should go without). North of Deal is the famous Roman Richborough Castle, and the quaint old town of Sandwich with its Norman church of St. Clement.

W. F. Potter.

The Opera by Telephone.—An interesting experiment took place at the opening of the present session of the London Hospital Medical College, on Monday evening, when a *conversazione* was given to a large company. By the kind permission of Mr. W. S. Gilbert and the United Telephone Company the Anatomical Theatre was placed in telephonic communication with the Savoy Theatre, and by this means many of the audience in the former building heard distinctly the æsthetic opera "Patience." The electric light used on the occasion is spoken of as being a great success, Professor Crookes's incandescent lamps being adopted (for the first time at a public exhibition), driven by a Gulcher dynamo machine.

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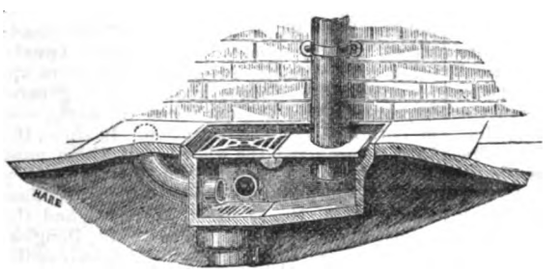
BELLMAN'S PATENT GULLY.

Messrs. Bellman & Ivey, of Wigmore-street, have recently introduced a gully, as shown below and in our advertising columns, which appears to be making its way. In size it measures 16 in. by 8¼ in. by 7 in. deep. It receives the main rain-water pipe of the house, and three waste-pipes, and disconnects the whole from the drain, as between it and the gully a P or S trap is fixed, which will necessarily always contain a water-seal. Over the outlet to the trap a grating is fitted, which prevents any solid matter



passing through, and the surface-grating being loose and of ample size, the trough of the gully can be kept clean with the greatest ease. Bellman's gully offers a great advantage over those made with the trap in one piece, as no matter where the drain may be, the gully may always be placed at right angles, as the trap can be turned in any direction to meet it. There is no splashing, and, at the same time, the gully acts to a certain extent as a ventilator to pipes and trap. Taken as a whole, it seems well adapted for the purpose for which it is intended, and is introduced at a price calculated to promote its extensive adoption.

From what we have seen of it in operation, we are disposed to recommend it for trial.

REREDOSES.

The parish church of Bettys-y-coed has lately received the addition of a reredos, as also a low stone wall, with moulded capping, under the chancel arch. The reredos, of simple design to suit the character of the church, is of Corsham Down Bath stone, the panels being of Forest of Dean stone. The central portion is emphasised by being slightly brought forward, and has a carved cresting. It consists of a wider central panel, with square shoulder cusp, having three panels on each side, containing, in carving, the lily, rose, wheat, grapes, passion-flower, and trefoil, and, over them, six square panels, quatre-foil cusped. The side wings each contain five arched and trefoil-cusped panels, with circular carved bosses between the arches. Above is a delicately-carved frieze of flowing foliage. Below the arched panels is a species of enriched string-course, with square pateras, and, underneath, a diapered ground. The funds were raised by a member of the congregation.

A neighbouring church, Ysputty, has likewise been furnished with a reredos, the gift of Lady Penrhryn. It is executed in Corsham Down Bath stone, the panels being of Dumfries stone. The height between the top of the table and the window being very limited, special means had to be taken to emphasise the centre. The hollow of the string-course or cornice is enriched by a pearl ornament. There is an elaborate Greek floriated cross in the centre, having on each side two square-headed cusped panels, separated by narrow projecting bands, containing various emblematical carvings. The panels to the wings of the reredos contain quatrefoils in the upper part, and, underneath, some reticulated work, formed by narrow projecting bands.

Both reredoses were executed from the designs of Mr. B. Edmund Ferrey, and carried out by Messrs. White & Sons, of Vauxhall Bridge-road.

MASTERS AND MEN IN THE BUILDING TRADE.

Sir,—I have just read the letter of "A Builder," in your impression of September 23, in which Mr. Potter's name is mentioned. Can it be possible that another strike is being worked up? I do hope that my brother working-men will not be influenced in that direction by any individuals any more. What about 1859, when many a man starved his wife and family, and himself too; sold his home; and what good has come of it? The secretaries of two or three trades have got into freehold houses; the victims are scratched, or in their grave, and the price of food, lodging, and clothing is forced up to an unnatural height; in point of fact, the money has lost its purchasing value, so that, in reality, wages have not risen at all.

I have read the report of the Trade Unions Congress: they do well to speak against paying wages in the public-house, but they would do better if they took their lodges from the public-house, and they would do better if they abolished the striking rules. If a man is not satisfied with his pay, let him seek a job elsewhere, and let him aid his fellow workman too. It is what we all ought to do, but when a secretary tells him that he must *sell his home* at the bidding of a committee, then I say "Perish the committee." The vote and the ballot, and the knowledge how to use them, are of more consequence, and will do more good for the working class of the country than all the strikes rolled in one; and let me beg my brother workmen to pause before they are led into one. If the young men who have got into the building trade were to study the history of the struggles of the working class, and notably strikes, they would find that organised strikes are only another name for the most odious tyranny under the sun.

There is much reform needed in many things; an English workman's life is not all honey, neither is an employer's, as the records of the Bankruptcy Court can tell; but when men come forward to lead us, those who are to be led have a right to inquire, Where are you going to lead us? What are you going to bring us to? Starving wives, broken homes, documents, blacks, whites, rows, riots, examinations before the magistrates! Look at the gas-stokers, the masons, the cabinet-makers, and others.

I am only a tailor myself, and I have fought in many a battle for progress, but there never has been, and there never will be, any permanent good come out of organised strikes; they are only palliatives.

For mercy sake, Mr. Editor, find a space for these few lines. Anti-Strike.

P.S.—I have been ruined by the striking system, and if you would be so kind as to insert my letter, I should feel obliged. Why should employers and employed act the part of madmen and destroy one another?

DRYING BUILDINGS.

With reference to the particulars we gave of the new Railway Hotel, Preston, Lancashire (p. 410, *ante*), Messrs. Dreyfus & Co. say:—

"We saw in your pages an article on this building. We beg to inform you that the whole of the building was dried by us with 'Ligny's Patent System.' This is the second hotel we have dried for the London and North-Western Railway Company,—Euston being the first one. We have also just completed drying the new Church of St. Mary, Whitechapel, so that the plaster of the interior may be decorated at once."

CHURCH-BUILDING NEWS.

Revelstoke.—The new church which Mr. E. C. Baring, the well-known banker and princely owner of Membland Hall, near the picturesque river Yealm, has just erected upon his estate at Revelstoke, was consecrated on the 6th ult. by the Bishop of Exeter. The church is perched upon the steep hill side, overlooking the sluggish Yealm. In the Perpendicular style of Gothic, it has a western tower, nave, aisles, chancel, and a large south-western porch. The fall of the ground is utilised for the introduction of vestries underneath the north aisle,—with which they communicate at their eastern end by a winding staircase, with turret. The main walls are of stone raised on the estate, and all the masonry dressings are of local granite. The roofs are of the local "wagon-head" shape,—stopped at the intersection of every rib and purlin by bosses. In the chancel the roof is made additionally rich by the introduction of sculptured angels representing the Church militant and triumphant, and by continuous running ornamentation. The walls of the chancel are lined with polished marble inlaid in various hues. This is the work of Mr. Gullett, of Yealmpton. The green Devonshire marble used is said to rival the best specimens from Galway. The pulpit stands upon the north side, and is of oak, upon a granite base. The seating throughout the church is entirely of massive oak. The bench ends and their fronts and backs are all diversely carved, the rich type of work prevalent in this county in the fifteenth century being carefully kept to. In the corner of one of the sculptured bench-ends, representing apparently a great sea-fight between galleons belonging to the Barings with their ancient foes the Spanish aggressors, there is inscribed in modest characters the following legend:—"Harry Hems and his merrie men carved all these benches at Exeter, A.D. 1882." It has been the aim of Mr. Baring that the church should be, in all respects, an entirely West Country production,—that Devonshire workmen and materials should be employed in preference to all others. The church has been designed by Mr. James Piers St. Aubyn, architect; the windows and other decorations are by Messrs. Fouracre & Watson, of Stonehouse. The main part of the whole edifice has been entirely built by Mr. Baring's own estate workmen, under the general supervision of Mr. Samuel W. Adams, of Plympton, his agent, and the immediate direction of the resident clerk of works, Mr. George W. Crosbie.

Ambleside.—The work now being carried out at Rydal Church comprises re-seating to nave in oak, new vestry and heating chamber, and windows to nave in freestone. The pulpit will be of old dark oak, with stone base and steps, having drapery panels in the lower part and open tracery work in the upper part. The floor of the church throughout will be laid with wood paving of an improved kind, recently introduced by the architect, and now very largely used in churches, schools, &c. A new chancel and organ-chamber with roof to nave will be built as funds permit. A special interest gathers round this church from the fact that Wordsworth, the poet, worshipped there, his residence being close by. The work is being carried out by local contractors, Mr. W. Stalker having the contract for woodwork, and Mr. T. Newton that for masonry. The whole of the alterations have been designed by Mr. R. Walker, architect, of Kendal and Windermere.

Small Heath, Birmingham.—On the 9th ult. the foundation-stone was laid of the Memorial Church which is about to be erected in Cookseyroad, Small Heath, to the memory of the late Rev. Dr. Oldknow. The style of the building will be Early English, simple in character, with very little attempt at ornamentation. When completed the church will consist of nave, with tower and spire at the north-west angle, north and south aisles and transepts, chancel, morning chapel on the north side of the chancel, and sacristies on the south side for the clergy and choir, with an organ-chamber over the latter. The exterior walls will be of red brick, with red Kenilworth stone mouldings and dressings; and the interior will be lined with white bricks, with red-moulded brick arches to nave, transepts, chancel, windows, &c., with Kenilworth stone mouldings and dressings and Wilderness stone columns. Provision is made for Devonshire marble shafts to carry the roof principals, which it is to be hoped may be given by generous donors during the execution or after the completion of the work. The extreme length from east to west will be 124 ft., and the width from north to south 56 ft. The height to the wall-plate will be 36 ft. The height of the spire will be 120 ft. Accommodation will be provided for about 700 sittings eventually, the first contract, consisting of the nave and north aisle, having accommodation for 510. The contract has been taken by Messrs. J. Barnsley & Sons, of Rylandstreet North, and the plans have been prepared by Mr. A. E. Dempster, architect and surveyor, Temple-row, Birmingham.

Hebburn Colliery.—On the 2nd ult. the foundation-stone of the Church of St. Oswald, Hebburn Colliery, was laid by the Rev. H. B. Carr, vicar of Whickham. The church is being erected from drawings by Mr. C. H. Fowler, F.S.A., architect, Durham, and will, when complete, consist of nave, aisles, chancel, bell-turret, organ-chamber, and vestry. The present contract (amounting to 1,777*l.* 10s.) is for nave and aisles only, to seat about 350 adults. The chancel will be built at an early date. The builder is Mr. S. B. Burton, of Newcastle. The church will be built of brick, with stone window dressings and arches. The lighting will be by a large four-light window in the west end, nine windows in the aisles, and eight windows in the clearstory. The floors will be formed of solid wood blocks, bedded on concrete, to prevent liability to dry rot. Special care has been also taken to prevent damp rising in the walls

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by the use of asphalte and Taylor's patent vitrified damp-course.

Oswaldtwistle.—On the 16th ult. the foundation-stone of a church to be dedicated to St. Paul was laid by Mrs. Watson, of the Rhyddings. The new church will seat 800 adults, and its cost, exclusive of tower, spire, and boundary-wall, is estimated at 6,500*l.* The site was given some years ago by Mr. R. Watson. The design is in the Middle Pointed style of architecture, and the total length of the church, outside measurement, will be 146 ft. 10 in. The interior will consist of chancel, a large parish-room, vestry and organ-chamber, nave, north and south aisles. The arcade dividing nave from aisles will be supported by ten granite columns with bases and floriated capitals. The western front will have two entrances, with a spacious narthex, 6 ft. wide. There will also be three other entrances. The church is to be built of local stone, from the Starhill quarry of Mr. W. Metcalf, with Box-ground dressings. The architects are Messrs. W. G. Habershon & Co., 38, Bloomsbury-square, and the builder is Mr. Thomas Clegg, Oswaldtwistle.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Boyle.—On the 17th of September the new Roman Catholic church, dedicated to St. Joseph, at Boyle, was consecrated. The church, which is within a short distance of the town, is erected on a picturesque site, close to the Convent of the Sisters of Mercy and to the new schools. It is separated merely by the river Boyle from the magnificent ruins of the Cistercian Abbey. It is late thirteenth-century Gothic in style, and is of the usual cruciform shape, consisting of nave, aisles, and transept. The length extends fully 120 ft., the breadth is nearly 60 ft., and to the ridge of the roof the height is about 70 ft. from the ground. At the western end is the tower, rising 60 ft., the roof being surmounted by an elaborately-wrought cross. The inside of the church has been thoroughly finished. The roof is supported by twelve massive pillars of limestone, and the aisles are subdivided from the nave by four bays of the same material, resting upon caps, shafts, and bases. The three altars, which have been executed by Mr. O'Neill, of Great Brunswick-street, Dublin, are the work of Irish industry. The canopy of the high altar reaches to a height of 13 ft., and is 12 ft. wide, while beneath the table is an elaborately-carved panel bearing a motto on either side, and containing a group of the Annunciation and an angel. The general material is of Caen stone, all the shafts being of emperors' red and Irish marbles. In the reredos, which is subdivided into four panels, there are four statues representing the four evangelists. This altar is the gift of the late Mr. Thomas M'Dermott, Belanagare. The side altar of the Blessed Virgin, and the altar of St. Joseph, consist chiefly of Irish marbles. The entire cost of the church is about 8,000*l.* Messrs. Goldie & Child are the architects of the building.

SCHOOL-BUILDING NEWS.

Cheadle Hulme.—On the 2nd ult. the Bishop of Manchester opened new school-buildings for the Manchester Warehousemen and Clerks' Orphan Asylum at Cheadle Hulme. The design of the new schools is Gothic in character, and in keeping with the architecture of the orphanage buildings. The elevations are of red stock brickwork, with stone dressings and terra-cotta strings and label moulds. The accommodation on the ground-floor consists of a large central schoolroom with a large classroom at each end, divided from the central school by movable partitions. These partitions, when raised, will form the three rooms into a large lecture-hall, 86 ft. long by 25 ft. wide, and capable of seating nearly 500 persons. There are separate entrances for the boys and girls at each end of the building, with stone staircases leading to the first floor. On the first floor is placed a large central schoolroom for the juniors, of the same size as the one below, and at each end are placed the chemical laboratory, with apparatus-room adjoining, for the boys on the one side; and a large sewing-room for the girls on the other. Ample cloak-room and lavatory accommodation is provided on both floors for the different schools, and private cloak-rooms for the teachers. There is also a storeroom for the school materials. The schools will accommodate about 460 scholars. The buildings have been erected by Messrs. R. Neill & Sons, contractors, of Manchester, from designs by and under the superintendence of Messrs. W. & G. Higginbottom, architects, St. James-square, Manchester. The schools have been erected in commemoration of the twenty-fifth anniversary of the foundation of the institution, and to meet its increasing requirements.

VARIORUM.

"The Practical Steam Engineer's Guide," by Emory Edwards (Sampson Low, Marston, & Co.), is addressed especially to the engineers, firemen, and steam-users of America, but will be found, we are inclined to think, a valuable guide and assistant to a similar class in this country. It includes a large number of illustrations, and is clearly printed.——The first article in the October number of the *Nineteenth Century* will interest many of our readers; it is on the "Financial Condition of Trade Unions," by Mr. George Howell, and should certainly invite criticism, it is so charmingly rose-coloured. He thinks the gross balances of all the Unions may be put down as being equal to one-third more than the gross annual income; this would give them, he says, a total available balance of cash in hand of about three millions sterling,—equivalent to eighteen months' contributions, fees, and fines.——The proprietors of the *Pictorial World* are making strenuous efforts to raise the character of this periodical, and are obviously succeeding. The first number of the new series, containing among other illustrations a portrait in colours of Sir Garnet Wolseley, is being reprinted as a special edition.——"*Fun's* Academy Skits" (153, Fleet-street) is a good shilling's-worth, very funny, and not ill-natured. Although the Exhibition is closed, the little book of skits is still worth buying.——The "Metal Turner's Handbook," by Paul N. Hasluck (Crosby Lockwood, 1882) should be useful to some of the younger candidates for the prizes offered by the Turners' Company. It includes 100 illustrations, and costs but a shilling.

Miscellanea.

Presentation to a Builder.—A few evenings ago a numerous company supped together at the Russell Arms, Bedford-street, Ampthill-square, on the occasion of the making a presentation to Mr. Stephen Jakins, builder, of Fitzroy-court, Tottenham-court-road. Mr. C. Spence, Mr. Jakins's foreman presided, and amongst those present were most of the firm's *employés*, as well as several contractors and merchants. On the removal of the cloth, the chairman made a few remarks as to the character of the gathering, observing that they had met together to do honour to a very worthy man. Mr. Jakins was not one of those "jerry" builders who put up a building which was blown down soon afterwards. His structures would last for centuries. The tenants on the estate of the Marquis de Rothwell, in Camden Town, and for whom Mr. Jakins was the builder, had freely come forward with their contributions, and the Marquis and Marchioness, directly they heard of the proposal, had sent cheques. Mr. Jakins was a straightforward, honourable, and businesslike man, and he had the greatest pleasure in asking the company to drink his health. Mr. Jakins, in a few appropriate and earnest words, thanked the subscribers for their gift (a valuable musical box), and the company for their good wishes. The members of the committee, Messrs. Pilkington, Brown, Jackson, Heal, and Sherriff, each spoke and alluded to the merits of Mr. Jakins, both as a builder and as an employer of labour, and referred to the amicable spirit that had been maintained between him and his *employés*.

Northern Architectural Association.—The annual meeting of this Association was held on the 3rd inst. in the Castle, Newcastle. The affairs of the Association were shown by the report read to be in a satisfactory condition. Mr. J. Tilman, F.R.I.B.A., of Sunderland, who presided, was re-elected president, and other officers were chosen for the next twelve months.

The Turners' Company.—The prizes awarded by this company were presented at the Mansion House on Thursday morning last. The exhibition included a considerable number of articles. Among the exhibits in wood were thermometers, vases, epergnes, flower-stands, candelabra, paper-racks, picture-frames, fruit-stands, and egg-cups. The judges in this class were Colonel Sandeman, Mr. C. Hutton Gregory, C.M.G., Mr. J. J. Holtzapffel, and Mr. Josolyne, and they awarded the first prize, consisting of a silver medal and the freedom of the company, to Thomas Macdonald, of Chapel-house-street, Millwall, and the second prize, comprising a bronze medal and four volumes of "Holtzapffel's Turning and Mechanical Manipulation," to W. A. Barber, of 92, Clevelandstreet, Fitzroy square. There were twenty other prize-winners, seven of whom were apprentices. The judges recognised a general improvement in the quality of the works sent in, both in design and execution. In stone, the judges considered the whole competition most satisfactory and useful. The first prize they awarded, for tazza and three plates, to William Banks, of 6, Henry-street, Battersea, and the second to John Thomas Stevens, of 21, Douglas-street, Vincent-square, for candelabra and candlesticks. In the precious stones class the principal prizes went to W. Gorsuch, Mr. Brown, Frederick Shambrook, and Edward Renton. We cannot quite endorse the appreciatory expressions of the judges. There was a considerable amount of good honest work, but the art displayed in many of the specimens was execrable.

Steven Brothers & Co.—The Milton Iron Works in Glasgow, with annexes in Upper Thames-street, London, is a very large establishment, and the newly-revised Illustrated Catalogue, just now issued (21st edition), is a large and expensive book to match. It is devoted more particularly to open and close fire kitchen-ranges, and will enable those who wish to make choice of such wares to do so with ease. One of Messrs. Steven Brothers' ranges ("123 in the book") obtained the first award at the Melbourne International Exhibition.

St. James's Church, Clerkenwell.—This parish church, which has undergone restoration, is about to be re-opened. Two large painted windows have been placed in the east end of the church, the gift of the "Crusaders'" Lodge of Freemasons, to commemorate the restoration; the subjects are "The Building of the Temple," and "The Queen of Sheba visiting the Temple on its completion." The Freemasons' and Crusaders' arms, numerous Masonic emblems, &c., are introduced. The windows are from the studio of Mr. Charles Evans, of Warwick-street.

Competition: Christmas Card Albums.—Messrs. Hildesheimer & Faulkner, publishers, are offering money for the best eighty albums, containing Christmas and New Year cards; and a further sum for certain fancy articles. It is a mere business advertisement, and they should take the ordinary means to make it known.

Herne Burial Board.—This Board advertised in August for competitive designs for a fence of oak, iron, or stone, and of a lych-gate, for Herne Churchyard. The premium was awarded on September 26 to Mr. Allan O. Collard, of the Metropolitan Board of Works Office.

Angell's Airtight Covers.—Mr. Angell, of 144, Fulham-road, has sent to the Exhibition of the Sanitary Congress in Newcastle specimens of his Airtight Manhole Covers, which are used at various points of the drainage in basements, so as to admit of examination, and are found to answer the purpose thoroughly well.

Stained Glass.—Another Munich window has just been placed in St. Alphege's Church, Blackfriars-road, representing Christ blessing little children. It is in memory of the wife of the Major-General Taylor, and has been designed and executed by Messrs. Mayer & Co.

Great International Fisheries Exhibition, 1883.—The construction of buildings for the Great International Fisheries Exhibition, 1883, has begun in the Royal Horticultural Society's Gardens, and considerable progress has already been made.

Burnley Borough Surveyorship.—At a meeting of the Burnley Town Council on Wednesday afternoon, Mr. Stafford, of Liverpool, was appointed borough surveyor, at a salary of 250*l.* per annum.

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"Dixon's New Metallic Gas." — The *Liverpool Daily Post* gives some particulars of a new illuminating gas, introduced by Mr. John Dixon, a gas engineer. Mr. Dixon claims for his invention the production of improved gas for illuminating purposes by the decomposition or dissolution of the component parts or constituents of metals, earths, acids, carbon, and hydro-carbon substances, the salts of alkalis, the dissolution of the substance being caused by heat. Certain chemical substances, when strongly heated, produce flames of peculiar colours, which, when blended, produce a white light, and, acting on this knowledge, the inventor claims to have realised what he says has been the dream of his life, and to have produced an apparatus capable of manufacturing and storing a gas the result of the decomposition of the afore-mentioned chemicals, so that now he is prepared to supply a gas which, he says, is not only superior to, but vastly cheaper than, any supplied by any other persons or companies in any part of the globe. The new gas can, it is stated, be made at about one-tenth of the cost of coal gas, and another merit claimed for it is that it can be burnt without vitiating the atmosphere of apartments to anything like the extent which results from the combustion of coal gas. Its luminosity, as tested with the photometer, is stated to compare very favourably with that of coal gas. A limited liability company has been formed to work the patent, and model works, capable of supplying gas for upwards of 1,000 ordinary burners, have been established in the Commercial-road, Liverpool.

What Co-operation can do. — A correspondent writes,—In 1847 the flour sold in Leeds by the millers of the neighbourhood was dear and bad, and the principal sufferers by this were the operatives of the district. A few of the most intelligent of their number got together and projected and started a co-operative mill. This proved a success, and, as years went on they added other articles to flour,—groceries, provisions, upholstery, tailoring, dressmaking, boot and shoe making, coal, &c. All these have been successful. I shall not trouble you with details or rate of progress; I desire simply to say that on last Saturday this society had 20,453 members, a capital invested by these members in business of 190,039*l.*, and a freehold and fixed stock in addition of 127,111*l.* Their business done during the last twelve months amounted to no less than 440,057*l.*; while in bonus and interest they paid to their members no less than 45,523*l.* during the same twelve months. This is one society, and there are in the country about 1,200 of them, though this is numerically the largest. I may add, that since 1844, when the first co-operative store was opened, 24 millions sterling have been divided among these working men in bonus and interest. There are nine millions sterling invested in business, and at the present moment two millions sterling per annum are divided among the working men composing these associations.

TENDERS

For new shop, and alterations to the Royal Oak Inn, Fenton, for Messrs. Keeling & Wright. Messrs. Keates & Bradford, Miles Bank-chambers, Hanley, architects. Quantities by the architects :—

Bradney & Co., Wolverhampton	£1,420 0 0
J. Gallimore, Newcastle, Staffordshire	1,330 0 0
J. T. Clarke, Hanley	1,276 0 0
Hancock & Tipping, Fenton	1,270 0 0
W. Collis, Longton	1,100 0 0
T. Minks, Fenton	1,095 0 0
C. Cornes, Hanley	1,085 0 0
Wetton & Meakin, Fenton*	1,070 0 0

* Accepted.

For rebuilding the Market Tavern, Tontine-street, Hanley, for Messrs. Keeling & Wright. Messrs. Keates & Bradford, Miles Bank-chambers, Hanley, architects. Quantities by the architects :—

Bradney & Co., Wolverhampton	£2,270 0 0
J. Gallimore, Newcastle, Staffordshire	2,138 0 0
J. T. Clarke, Hanley	2,100 0 0
Meadon & Sons, Newcastle, Staffordshire	2,082 0 0
J. K. Tildesley, Hanley	2,055 0 0
G. Ellis, Hanley*	2,000 0 0
E. Gibson, Tunstall	1,995 0 0
C. Cornes, Hanley	1,799 0 0

* Accepted, subject to reductions.

For the enlargement of Albion-street Schools, for the School Board for London. Mr. E. R. Robson, architect :—

W. Shephard	£3,927 0 0
H. Hart	3,086 0 0
Kirk & Randall	3,019 10 0
S. J. Jerrard	2,983 0 0
W. Downs	2,939 0 0
T. Higgs	2,896 0 0
J. Oliver	2,893 0 0
B. E. Nightingale	2,881 0

For the supply of cast-iron water mains, to be cast vertically, for the Worthing Local Board of Health. Mr. Walter Horne, surveyor :—

	Per Ton.				
	8-inch.	6-inch.	4-inch.	3-inch.	Irregulars.
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Messrs. Macfarlane, Strang, & Co.	5 9 0	5 9 0	5 9 0	5 9 0	10 0 0
The Tees Side Iron and Engine Works Co.	5 5 0	5 5 0	5 5 0	5 5 0	10 0 0
J. J. Robson	5 12 6	5 12 6	5 12 6	5 12 6	8 17 6
Cambrian Iron and Brass Foundry	5 4 0	5 4 0	5 4 0	5 4 0	8 4 0
Joseph Gould	5 2 6	5 2 6	5 5 0	5 7 6	8 17 6
Cochrane & Co.	5 2 6	5 2 6	5 5 0	5 5 0	8 15 0
J. S. Roberts	5 0 0	5 2 6	5 3 0	5 3 0	8 5 0
J. Harrison	5 0 0	5 0 0	5 2 0	5 4 0	8 5 0
Staveley Coal and Iron Co.	5 2 6	5 2 6	5 2 6	5 2 6	7 10 0
The Thames Bank Iron Co.	4 19 9	4 19 9	4 19 9	5 4 9	8 5 0
C. E. Firenstone Bros.	4 16 3	4 16 3	4 16 3	4 18 9	7 15 0
Stanton Ironworks Co. (accepted)	4 14 0	4 14 0	4 15 0	4 19 0	7 10 0

For taking up old water mains and re-laying with new pipes, for the Worthing Local Board of Health, at per ton :—

	8-inch.	6-inch.	4-inch.	3-inch.	Irrglrs.
	s. d.	s. d.	s. d.	s. d.	£. s. d.
J. Dibley	3 2	2 6	2 1	1 9	5 0 0
H.T. Horscroft	2 6	2 3	1 9	1 6	5 0 0
J. J. Robson	2 6	2 2	1 7	1 4	3 10 0
J. Harrison	2 2	1 9	1 4	1 0	2 0 0
Joseph Gould*	2 0	1 6	1 4	1 2	1 10 0

* Accepted.

For the forming of 18 in., 15 in., and 12 in. pipe sewer, in Brighton-road, Worthing, for the Worthing Local Board of Health. Mr. Walter Horne, surveyor :—

J. Dibley	£748 1 3
James Blaker	738 0 0
T. C. Kerridge	634 10 10
Woodham & Fry	612 10 0
J. J. Robson	601 6 3
J. Harrison	585 17 4
Joseph Gould (accepted)	533 13 6

For the erection of a girls' and infants' school at Castelnau, for the Barnes School Board. Mr. C. Innes, architect :—

G. Legford	£1,533 0 0
J. Longley	1,527 0 0
F. R. Tozer	1,512 0 0
W. Parkinson	1,475 0 0
W. H. Wheeler	1,465 0 0
A. Drew	1,420 0 0
W. T. Brockwell & Son	1,398 0 0
Eayres & Sampson	1,395 0 0
J. Anley	1,390 0 0
Jones & Co.	1,390 0 0
J. Tyerman	1,389 0 0
C. J. Bartlett	1,389 0 0
G. Torkington	1,382 0 0
S. Eyles	1,370 0 0
F. Higgs	1,364 0 0
W. Batstone	1,360 0 0
H. Hunt	1,350 0 0
G. Reavell	1,299 0 0
C. Wilson	1,289 0 0
Priestley & Gurney	1,280 0 0
J. Stayner	1,256 0 0
J. Bryant	1,250 0 0
W. Johnson	1,209 0 0
Dawson & Sons	1,199 0 0
A. Hunt	1,174 0 0
C. Collins	1,145 0 0

For the formation, curbing, channelling, and paving Anchor-place, Longton, for the Town Council. Mr. Arden Hardwicke, C.E., borough surveyor :—

C. Lloyd, Stoke-on-Trent	£227 0 0
W. T. Moss, Stafford	199 19 10
J. H. Hawley, Longton	197 2 0
James Boughey, Stoke-on-Trent	195 10 0
John Mackey, Stoke-on-Trent	191 8 0
James Thorn, Longton (accepted)	183 8 5

For the formation, curbing, channelling, and paving Gladstone-street, Longton, for the Town Council. Mr. Arden Hardwicke, borough surveyor :—

C. Lloyd, Stoke-on-Trent	£261 12 6
W. T. Moss, Stafford	220 0 2
J. H. Hawley, Longton	213 0 0
John Mackey, Stoke-on-Trent	209 14 0
James Thorn, Longton (accepted)	203 11 3
James Boughey, Stoke-on-Trent	199 5 0

For building eight houses at Aldrington, Brighton, for Major J. Childs. Mr. George Edwards, architect. Quantities by Mr. H. Lovegrove :—

Lockyer, Brighton	£19,961 0 0
Oliver, Brighton	18,500 0 0
Goddard & Sons, Farnham	17,486 0 0
Tyerman, London	17,095 0 0
Perry & Co., London	16,956 0 0
Scrivener & Co., London	16,782 0 0
Reynolds, Brighton	16,749 0 0
Nightingale, London	16,482 0 0
Chappell, London	16,256 0 0
Adcock, Dover	16,140 0 0
Humphrey & Sons, Brighton	15,850 0 0
Holliday & Greenwood, London	15,777 0 0
Martin, Wells, & Co., Aldershot	15,639 0 0
Green, London	15,639 0 0
Barnes, Brighton	15,200 0 0
Stimpson & Co., London (accepted)	14,600 0 0

For sundry works in erecting new wing and making certain alterations and additions to the premises, No. 6, Gloucester-road, Regent's Park, for Mr. Robert Borwick. Messrs. C. Eales & Son, architects :—

Scrivener & Co.	£1,299 0 0
Mark	1,257 0 0
Drew	1,199 0 0
Shaw	1,198 0 0
Harradine	1,195 0 0
Pritchard	1,156 0 0
Goode Bros.	1,112 18 0
Taylor & Parfitt (accepted)	1,019 0 0

For the erection of five houses in the Hastings-road, Ealing Dean. Mr. Robert Willey, 66, Ludgate-hill, architect :—

Stops, Ealing (accepted)	£1,060 0 0

For drainage, for the Brentford Local Board. Messrs. Gotto & Beesley, engineers, 17a, Great George-street, Westminster :—

Contract No. 2.—Cast-iron Pipes.

J. Hayward, Eastbourne	£5,681 9 0
Macfarlane & Co., Glasgow	5,673 11 10
Thos. Edington & Son, Glasgow	5,413 16 1
Thos. Spittle, Newport	4,897 14 0
Tees-side Iron Co., Middlesbrough	4,762 3 5
The Butterley Co., Alfreton	4,677 3 8
Firmston Bros., Stourbridge	4,423 14 7
Cochrane & Co., Dudley	4,392 12 4
J. & S. Roberts, West Bromwich	4,278 7 9
Stanton Iron Works, Nottingham	4,258 19 11
Kellett & Bentley, 4, Queen Victoria-street	4,234 10 8
Jas. Oakes & Co., 21, Wharf-road	4,151 7 8
Cochrane, Groves, & Co., Middlesbrough	4,141 5 3
The Staveley Coal and Iron Co.*	4,052 5 6

* Accepted.

Contract No. 3.—Steam-engines, &c.

D. Howarth & Co., Rochdale	£4,338 0 0
C. Powis & Co., Gracechurch-street	4,175 0 0
J. Rowan & Son, Belfast	4,150 0 0
J. Clayton, Preston	3,975 0 0
Vernon & Ewins, Westminster-chambers	3,968 0 0
Pollock & McNab, Manchester	3,800 0 0
Gimson & Co., Leicester	3,550 0 0
J. Warner & Son, Cripplegate	3,400 0 0
John Esson, Fetter-lane	3,350 0 0
Western & Co., Derby	3,090 0 0
Tangyes (Limited), Birmingham	3,070 0 0
W. & J. Yates, Blackburn (too late)	2,980 0 0
Jas. Watt & Co., Soho (accepted)	2,600 0 0

Contract No. 4.—Buildings and Sewers.

W. J. Botterill, 110, Cannon-street	£26,405 0 0
F. Nowell, Shepherd's-bush	22,500 0 0
G. Law, Kidderminster	21,584 0 0
Jos. Mears, Hammersmith	20,150 0 0
McKenzie, Williams, & Co.	20,072 0 0
Nowell & Robson, Kensington	19,760 0 0
J. G. Marshall, Brighton	19,600 0 0
J. Hayward, Eastbourne	19,447 0 0
G. G. Rayner, Bootle	17,500 0 0
Kellett & Bentley, Queen Victoria-street	17,466 0 0
Jas. Dickson, St. Alban's	17,034 0 0
Jas. Dooley, Tottenham	15,058 0 0
Ford & Everett, Westminster*	14,500 0 0

* Accepted.

For additions and alterations to premises, No. 212, Westminster Bridge-road, for Messrs. Atkinson & Co. Messrs. John Giles & Gough, architects. Quantities by Mr. C. H. Goode :—

Higgs & Hill	£1,834 0 0
Niblett	1,829 0 0
Hook	1,800 0 0
Lathey Bros.	1,730 0 0
Ansell	1,634 0 0
Nightingale	1,616 0 0
Lapthorne & Co.	1,599 0 0
Holliday & Greenwood	1,550 0 0

For alterations to the Britannia public-house, Mare-street, Hackney, for Mr. White. Messrs. Williams & Sons, architects :—

Smith	£155 0 0
Wood	119 0 0
Marr (accepted)	109 0 0

For alterations to the Crown public-house, Grove-road, Hammersmith, for Mr. W. H. Johnson :—

Chamberlain Bros.	£789 0 0
Anley	714 0 0
Marr (accepted)	692 0 0

For the entire re-decoration of the Metropolitan Music-hall, Edgware-road, for Mr. Lake :—

F. Mark	£780 0 0
Maple & Co.	697 10 0
Silani	420 0 0
Rosenburg	412 0 0
Battam & Haywood	410 0 0
E. Bell	380 0 0

For works at the Old England Tavern, for Mr. G. W. Wakley. Messrs. Perry & Seamen, architects :—

Adams	£1,045 0 0
Stimpson & Co.	893 0 0
Beale	865 0 0
Jackson & Todd	745 0 0

For detached villa residence, Altrincham, for Mr. Wm. Allwood, exclusive of fittings and boundary-walls. Mr. Wm. Owen, Manchester, architect :—

Hy. Ormson, Bowden	£589 0 0
Jas. Hamilton, Bowden	566 0 0
J. Pennington, Bowden	568 0 0
Martin Stone, Altrincham (accepted)	560 0 0

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For new club-house for the South Hampstead Working Men's Club, Fleet-road, Hampstead. Mr. Frederic A. Gosling, architect, 148, Hampstead-road. Quantities supplied:—

Groome	£2,175	0	0
Allen & Son	1,700	0	0
Blandford & Co.	1,589	0	0
Miller	1,564	0	0
Newton	1,535	0	0
Crabb	1,455	0	0
Angood	1,420	0	0
Killby	1,414	0	0
Allard	1,400	0	0
Jones & Co.	1,389	0	0
Carpenter & Poole	1,385	0	0
Martin & Goddard	1,380	0	0
Niblett	1,375	0	0
Richardson Bros.	1,365	0	0
Scott	1,347	0	0
Trewecke & Co.	1,337	0	0
Parker	1,297	0	0
Aldridge & Jenvey	1,184	14	0
Garrud (accepted)	1,183	0	0

For schools, Cook's Ground, Chelsea, for the School Board for London. Mr. E. R. Robson, architect:—

J. T. Chappell	£8,350	0	0
C. Wall	8,195	0	0
J. Marsland	8,127	0	0
J. Grover	7,988	0	0
W. Shurmur	7,983	0	0
Higgs & Hill	7,938	0	0
Stimpson & Co.	7,712	0	0
W. Oldrey	7,700	0	0

For schools, Gloucester-grove East, Chelsea, for the School Board for London. Mr. E. R. Robson, architect:—

J. T. Chappell	£2,190	0	0
J. Marsland	2,180	0	0
W. Oldrey	2,134	0	0
Higgs & Hill	2,114	0	0
C. Wall	2,098	0	0
J. Grover	1,988	0	0
W. Shurmur	1,980	0	0
Stimpson & Co.	1,888	0	0

For residence, New Malden, Surrey, for Mr. C. Derry. Mr. W. D. Church, architect, 12, South-place, Finsbury. Quantities by Messrs. Osborne & Russell:—

Aviss & Co.	£2,725	0	0
Woodward	2,656	0	0
Dove Bros.	2,650	0	0
Sabey	2,599	0	0
Gibbs & Flew	2,538	0	0
Killby	2,490	0	0
Taylor & Parfitt	2,475	0	0
Stimpson & Co.	2,425	0	0
Hearle & Son	2,381	0	0
Shurmur (accepted)	2,349	0	0

For works at Kent County Lunatic Asylum, Chartham Downs. Mr. Frederick W. Ruck, county surveyor:—

Contract No. 1.—Extension of Day-room.

Harris & Son, Tunbridge Wells	£1,144	0	0
J. Wood & Co., Peckham	1,029	0	0
William Brooks, Folkestone	865	0	0
J. J. Wise, Deal	821	0	0
G. H. Denne, Deal	785	0	0
Wallis & Clements, Maidstone	763	0	0
Paramor & Son, Margate	760	0	0
W. & T. Denne, Walmer, Kent	725	0	0
A. N. Pryer & Co., Maidstone	729	0	0
Hayward & Paramor, Folkestone	709	0	0
John Shurmur, Kingsland	660	0	0
R. Hatton, Sturry, Kent (accepted)	651	0	0
B. Pitt, Upper Eastville, near Bristol	569	0	0

Contract No. 2.—Additions to Sanitary Block (Men's), Wards 3 and 4.

William Brooks, Folkestone	£635	0	0
J. J. Wise, Deal	558	0	0
J. Wood & Co., Peckham	539	0	0
G. H. Denne, Deal	530	0	0
Wallis & Clements, Maidstone	530	0	0
W. & T. Denne, Walmer, Kent	500	0	0
Paramor & Son, Margate	491	0	0
A. N. Pryer & Co., Maidstone	489	0	0
Harris & Son, Tunbridge Wells	484	0	0
Hayward & Paramor, Folkestone	465	0	0
R. Hatton, Sturry, Kent (accepted)	460	0	0
John Shurmur, Kingsland	440	0	0
B. Pitt, Upper Eastville, near Bristol	390	0	0

For alterations and additions to Lambeth Workhouse, Lower Kennington-lane. Messrs. Wilson, Son, & Aldwinckle, architects:—

W. Shurmur (accepted).

For the erection of a pair of houses in Melville-street, Ryde. Mr. R. J. Cornewall Jones, architect. Quantities supplied:—

W. Ward, Portsmouth	£2,453	0	0
T. Saunders, Ryde	2,453	0	0
Salter, Ryde	2,430	0	0
Jenkins Bros., Ryde	2,365	0	0
Jolliffe, Sandown	2,339	0	0
Hutchings, Binstead	2,285	0	0
Meader, Ryde	2,140	0	0
Sibley, Ryde	2,095	0	0
E. James, Binstead (accepted)	1,915	0	0

For alterations and additions to the Kensington Workhouse and Infirmary, for the Guardians. Messrs. A. & C. Harston, architects, 15, Leadenhall-street:—

Cowland & Co.	£2,550	0	0
Crockett	2,297	0	0
Nightingale, Albert Embankment*	1,887	0	0

* Accepted.

Sanitary Fittings and Engineering Work.

Clark, Bunnett, & Co.	£2,500	11	0
Chadwick	1,965	0	0
Jeakes & Co.	1,884	6	0
Nightingale	1,668	0	0
Stidder & Co.	1,562	0	0
G. Crapper	1,445	0	0
May Bros. Holborn (accepted)	1,280	0	0

For alterations and additions to house, Maida Vale. Mr. C. H. Thomas, architect. Quantities by Messrs. J. & A. E. Bull:—

Nunn	£1,946	0	0
Oldrey	1,857	0	0
Hook	1,660	0	0

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The Builder.

Vol. XLIII. No. 20. Saturday, October 14, 1882.

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The Months and Seasons in Early English Art.

It has been shown, in our recent article upon Tesselated Pavements, that the artists of ancient Rome have left to us, but little injured by the devastations of twenty centuries, several mosaic pictures of the deities who presided over the months or the seasons, and representations in squares of coloured stone and glass of the months personified in human guise surrounded with attributes of conventional detail. Whether these pictures, elegantly and chastely conceived as they are, and executed in a manner which speaks eloquently of the labour and feeling of the art-workman to whom their fabrication is due, were suggested by the artistic productions of any race older in the application of pictorial devices to paved floors than the Romans, or not, it would be difficult to decide. It may be that they were originally suggested to æsthetic minds by the fortuitous arrangement of the multi-coloured pebbles of a Mediterranean beach. But it matters little to speculate how first the idea of perpetuating a picture in a pavement arose. There can, however, be no doubt that just in the same way as the ornamental borders and geometrical patterns of the Roman pavements, at that period fairly numerous in England, were studied and reproduced in the earliest ornamental mouldings, entablatures, cornices, and other subordinate parts of native English ecclesiastical architecture, for example, in the guilloche and billet moulding, so also it is clear that the representations in the circular panels and compartments of these pavements,—themselves not altogether unlike the pictures which are found on the walls of Roman villas, or in the vellum pages of the early Roman manuscripts in the Vatican Library,—suggested to the expanding mind of the draughtsman and illuminator many of the beautiful groups which are found in the calendars prefixed, from the tenth to the fifteenth century, by the scribes of the Psalters and miscellaneous Service Books, to the volumes which yet exist to testify to the elegant character of this class of early art. These groups, of which the manuscripts in the British Museum contain a considerable number, are introduced into the portions set apart for the monthly calendar, and in many cases they are balanced by similar pictures, also set in round panels or niches, of the zodiacal symbols with which we are all familiar; some, however, of the earlier pictures are drawn along the lower margins of the pages without any bounding line. In one of these, the celebrated Cottonian MS., Julius A. vi., a work of the eleventh century, January is illustrated in outline drawing by a group representing the practice of the art of ploughing. Four oxen are drawing the double-handled and wheeled plough over the peculiar hummocky ground which is so thoroughly representative of Saxon landscapes. The construction of the plough shows considerable intricacy. The oxen, yoked in two pairs, are guided by a man standing before them, and holding a long goad. Close behind the ploughman walks the sower with a bag of grain in his grasp, handfuls of which he is scattering among the irregular heaps and clods thrown up by the ploughshare. The whole picture is as natural and intelligible to-day as it was when first drawn 800 years ago. It may be compared with similar scenes in the celebrated Utrecht Psalter. Another Cottonian manuscript, Tiberius B. vi., contains a picture very richly coloured, but not so firmly drawn, containing but few points of difference in its details from this one. Later MSS., such as Nero C. iv., of the twelfth century and of English style, represent the opening month of the year as Janus, the two-faced Classic deity, holding a key in his hand, thereby symbolising the unlocking of the new year. This design is clearly of ancient origin, and there can be little doubt that it was suggested by a similar treatment of the month in a mosaic pavement, similar to those of personified months and seasons found at Corinium or Cirencester to which reference has been formerly made. Still later art symbolises January by a pretty little vignette of a man seated on a stool or chair, drinking from a bowl, which he raises to his mouth with one hand, while in the other he holds a boot, the naked foot from which he has taken it being held to get warmth in front of a blazing fire upon the hearth. Sometimes a variation is introduced by the addition of a crutch in the hands of the figure, so as to point more conspicuously to the effects of winter upon the feet. Occasionally, a wine barrel, with a spigot in it, is painted at the side or in the background, thereby pointing out the nature of the beverage which the principal figure is quaffing, for January was in the early Middle Ages quite as markedly a month of feasting and jollity as it is even in these later days. Sometimes, also, the dress of the man seems to indicate that he belonged to some religious order, monastic or ecclesiastical. This scene of warming the feet before a fire is occasionally enhanced with the addition of a caldron or pot hanging over the fire upon a serrated hook. At other times it is replaced by the scene of a table set out with viands of somewhat uncertain kinds, at which a hungry host or guest is being regaled.

February is variously symbolised. The earliest manuscripts show scenes of pruning or lopping trees, the operator being armed with a curved bill, not unlike those used for chopping wood at the present day, the trees being, however, of a stiff and conventional form, with branches fantastically bent into unnatural positions. Sometimes the month is personified by a woman with freely-flowing hair and gaudily-decorated robes, holding up in each hand a long candle or taper, lighted and ornamented with spiral bands. This device appears to refer to the great church feast of Candlemas, *Festum Candelarum*, or the Purification of the Blessed Virgin Mary. One early manuscript departs from this conventional design, and places in its stead a figure of a man seated warming himself before a fire, a device more commonly attributed, as has been shown above, to the preceding month. Another MS. in the Harley collection in the British Museum, No. 4,940, has for its February illustration a nun, or female in quaint attire, wearing a pair of black stockings, and holding up one leg in the attitude of a ballerina.

March is represented in several ways. The oldest manuscripts show various agricultural operations proper to the month, such as sowing grain, digging, raking, or hoeing the earth, and breaking up the clods with an axe or chopper; some of the hoes have a crescent blade of peculiar form, almost Eastern in its curves; the sower is provided with a basket or sieve; the digger has a spade with a single shoulder only, not unlike some of the ancient spades recently figured by the late Mr. James Drummond, and described by Mr. Joseph Anderson in the work entitled "Ancient Scottish Weapons." The rake is broad and armed with nine teeth; the pickaxe and hoe have forms with which we are not unfamiliar from their frequent occurrence in works of archæological illustration. A man lopping trees is a favourite symbol of the month of March, and in illuminated calendars of the twelfth and thirteenth centuries the resplendent colouring of the scenes, the gorgeous hues of the dress of the woodman, the golden backgrounds, and the elegant curves of the branches enriched with leaves of trefoil or other conventional and regular patterns, combine to make up a very beautiful and typical picture of the spring-time occupations of our rustic forefathers. One of these pictures of woodland is enriched with a bird's curious conical nest on the branches of a tree, but horizon is wanting and perspective faulty or disproportioned.

April is a joyous month, for the spring has already come in, and therefore the greater number of pictures symbolical of this month contain a youth in light clothing advancing towards the front, and holding up in each hand a branch of hawthorn or other native tree loaded with flowers and foliage. This, there can be little doubt, points to the custom pre-

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valent at the present time of gathering the may, or whitethorn, a custom dear to the lower classes who dwell in great cities, and only too often ruthlessly destructive of the suburban hedges. It may be that some reference to the going of Noah out of the ark, a festival celebrated on the penultimate day of the month, is involved in this ancient custom of gathering the green leaf as an earnest that the wet season of winter was passed and the byeways of the earth once again become pleasant and habitable. One early manuscript in the Cottonian collection replaces this usual scene with that of a feast, where three personages are seated on a throne or couch, which is adorned with terminals having the form of animals' heads,—the lion and wolf,—with an attendant pouring out wine or other festive drink on the right hand, and a guardian warrior, armed with shield and spear, on the left hand. Another equally ancient manuscript, dating from the eleventh century, has a picture of similar import, with the addition of an attendant blowing a horn. The month of May, in the earliest calendars, is illustrated by a picture of shepherds tending their flocks of sheep, in which the ram with his curling horn, and the ewe with her lamb, the crook, and the lamb in the arms of the shepherd, are naturally depicted with that charm which the simple homely character of Saxon drawings always possess. In another equally early manuscript a group of sheperdesses or country girls is introduced. But this scene gives place in succeeding ages to the far more frequent vignette of a falconer, either riding upon a horse or standing full-length, and holding on his wrist a falcon, hooded and jessed. Dancing, love-making, and turning sheep out to grass are also met with occasionally.

June is a very varied month in its early symbolical representations, and there is some confusion in the early manuscripts between this month and July and August. One of the oldest illustrations (Julius A. vi.) consists of a man loading the felled stumps of trees into a primitive wain or car, which is furnished with two wheels, and drawn by a pair of oxen yoked together. This very scene is given in another Saxon manuscript (Tiberius, B. v.) as the emblematic picture of July, the June scene in this manuscript being derived from the August scene in the Cotton Julius. Later illuminations attributed to June show scenes of haymaking, sheep-shearing, field sports, or tourneys, but principally of mowing with scythes, in some examples serrated on the cutting edges, in other examples indistinguishable in point of shape from those at present in use,—a striking instance of the survival of the forms of implements in common use; of gathering trefoiled and quatrefoiled flowers in a gaily-coloured field; or of men carrying bundles of faggots or boards, carefully corded, upon the back. The early Cotton manuscript already mentioned indicates July by a party of five grass-cutters each carrying a scythe, one in the act of sharpening his blade with a whetstone, another preparing to do so, while the three others are cutting the grass before them. An assistant stands by, using a two-pronged fork. Reaping with a sickle having a toothed edge in some cases is found in the vignettes of early calendars, but by far the most frequent is that of mowing.

In July, also, the manuscripts of English origin represent not only haymaking, but hoeing wheat, and French and Flemish manuscripts indicate the art of reaping. August is indicated in Saxon MSS. by a wattled wagon, men reaping with the sickle, and carrying the cut corn to the cart, a watchman being stationed at each side of the field, on guard with a spear, against any sudden irruption of the too frequent enemy. One labourer appears to be using a kind of hand-drill. But scythes and sickles are frequently given in illustrations for this month. Sometimes the reaper gives place to the sower, as in the Cotton MS. (Nero, C. iv.); and the foreign manuscripts show the thrashing of the new grain, or a scene of shearing sheep.

September marks an epoch of the year; the Saxon MSS. are illustrated in this month of their calendar with driving swine to the forests, while an attendant blows a horn to warn the wanderer, and as an indication of his peaceful presence in the neutral ground which at that time lay between village and village, the "mark" land where law and right had little power to assert their ascendancy over prehistoric custom of indiscriminate attack. Sowing grain from a bin or pocket, pruning vines and fruit-trees, gathering and treading out the grapes, also not unfrequently form the emblematic representation of the month of September. The wine-vat, the earnest manner of the vintager, naked or draped gorgeously, and often raising a bowl of the juice to his lips, and the accessories of the wine harvest, are vividly and truthfully portrayed.

October begins to indicate a flagging of the annual spirits. Early codices show a heron or other large feathered game feeding in a forest, a man on foot, with rugged alpenstock or staff, flying a falcon at the game, a horseman also letting loose his trained hawk at the quarry, but ploughing, sowing grain out of a basket, wine-treading and juice-tasting, gathering grapes with a knife of strange crescentic form into a hemispherical basket, and beating down acorns for the swine, are also found to be used as typical illustrations for the month.

But November appears to have been the really correct time for driving herds of swine to the woods and beating down the acorns and the beech-mast for them, the curious form of the club being well worthy of notice; but the earliest manuscripts show a party of persons warming their hands before a blazing fire, while others carry a handful of sticks or fuel to add to it, the tongs, the bundles of faggots, and the wattled wall being in every case details of interest. Killing fatted oxen or pigs with the two-handed axe, and carrying the dead meat away on a man's back while another destined victim looks vacantly upwards at the butcher, are not infrequent representations of this month in our early art-pictures.

December ushers in, at length, the end of the year's round of typical employments and customary duties. The early art indicates the carrying of corn in heavy baskets, borne by two men, on a pole; thrashing the grain with the flail; sifting or winnowing the results of the harvest; feasting at a well-spread board; killing cattle or swine with a heavy axe, upraised while the slaughterman places one foot upon the creature whose life he is about to take; sometimes the butcher is draped in a blue apron, girded up, and armed with a large axe, of which he appears to use the back, and not the edge, upon the devoted animal. One class of manuscripts represents December by a baker standing before an open oven and holding a peel in his hand, in the act of attending to the baking of bread and cakes. In some cases scenes of hunting are substituted for, or added to, the above-mentioned autumnal scenes; and occasionally, but very rarely, the December amusements are skating and sleighing. Most of these illuminated pictures are represented in minute detail, and afford to the student of ancient and Mediæval arts excellent examples of manners and customs, dress and details of interiors. A copious list of the manuscripts in the British Museum, containing the subjects of these calendar emblems, will be found in a volume, published in 1879, entitled "Early Drawings and Illuminations in the British Museum," by W. De Gray Birch and H. Jenner, at p. 265. Every one of the manuscripts will bear the closest and most careful scrutiny, for they are the representations of an art which has perished along with the scenes they delineate. The pictorial art which finds a place in modern calendars, although often ingenious, does not appear to have been inspired or influenced by a due and proper examination of these, its ancient prototypes, and, in so far, it fails to carry out the sacred, if not divine, precept of handing down to posterity the lamp of human observation, which should be taken in hand with reverence and passed on to future ages with undiminished lustre, and, if possible, increased admiration for the things that belong to past ages, although the spirit of their influence is even yet not altogether dead among us.

Woolwich.—A monument is being erected at the entrance to the Gun Park, Woolwich Common, in memory of the officers and men of the Royal Artillery who fell in the Zulu and last Afghan wars. The memorial is in the form of massive granite blocks, and is being erected by voluntary contributions from the officers and men of the Royal Artillery throughout the world, the subscription being limited to one day's pay. The monument was designed by Count Gleichen, the artist for the new Prince Imperial memorial at the Royal Military Academy.

PROPORTION IN PRACTICE.

A QUESTION STATED.

The subject of proportion as an essential agent and element in architectural design has been treated of so frequently and so variously, and nevertheless so irrepressibly recurs, that it seems to be matter of importance, in the interest of all parties to the discussion, that the questions which bear upon it should be clearly stated; and before discussion goes further,—as go further it certainly will,—certain bearings should be established which will enable bystanders to distinguish confused or irrelevant arguments from those which go straight at the obstacles to a simple and satisfactory solution.

The importance of proportion in architectural design in a general sense no one denies. So far as architecture leans upon engineering,—so far as it works under the conditions of stability of construction and economy of materials,—the designer is occupied with a succession of problems that turn upon the adjustment of relative quantities; that is, of proportion between weights and supports, thrusts and counter-thrusts, strains and resistances, voids and solids. A general regard to proportion is concerned no less in the combination of apartments and communications, in section and in plan.

And so as regards elevations and decorative treatment of members and details,—all are agreed to give chief applause to the designer whose work commends itself as pervaded by a fine sense of proportion. It is to such a sense, in fact, that the largest share of honour is assigned, alike when clumsiness and when feebleness is evaded,—when the mean between the too little and too much, the *poco piu* and *poco meno* of the Italian master, is happily and harmoniously achieved.

So far there appears to be scarcely an opening for disagreement; but, as usual, it is when generalities are narrowed down to the requirements of specific application,—when abstract theory has to make good its importance and utility in the face of a novel and diversified complex of particular circumstances, that occasions spring up for conflict of opinion, or for hesitations and perplexities, that forbid the student to commit himself to a very positive expression of either differences or agreement.

Difficulties enough are likely to arise with respect to selection of occasions for the application of proportion; but even when these are settled, opportunity is opened for discussion over a principle which may or may not affect more or fewer of these applications.

The importance of general regard to proportion in design being conceded, the question arises as to the degree of strictness with which we are to hold ourselves bound to such concession. Is there, in fact, any value in the observance of minutely precise proportions, whether extensive or moderate dimensions are to be dealt with? Is there, to take one example, any advantage to compensate for expenditure of solicitous care in exacting that a dimension of 100 ft. shall be executed without an error in excess or defect equal to the tenth of an inch?

A question in this extreme form might never have arisen but for the precedents which remain to us in the works of the Greeks. It is averred on authority, with every claim to command our respect, that the example given is no exaggeration of the scrupulousness of their best architects in their noblest works. And whatever differences and doubts may exist as to the extent and definiteness with which any theory of proportion was worked out and accepted by the Greeks, there are none whatever as to their sense of proportion as evidenced by the effects of their works; their practical success is at least beyond cavil. A controversy is thus prepared for between those who assume,—and even say that they are prepared to prove,—that the Greeks worked upon a system of refined numerical proportion, and those who ascribe their success to no theory, but to an instinctive appreciation of the relative dimensions and magnitudes that would produce a beautiful effect. Even so, they will observe, one gifted with a good ear will sing in tune though entirely destitute of musical culture, and may even originate expressive airs which surpass the inventions of many a scientific musician; but an explanation of this kind manifestly goes no way towards accounting for the execution of architectural proportions with the infinitesimal accuracy of the example.

Here at once the controversy opens, and upon a double issue; or, rather, as we are not writing as controversialists, here at once we have to

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pause and clear our ground before all parties to the inquiry can move on easily and amicably abreast. What sufficient assurance have we, in the first place, that the Greeks did execute their works with such marvellously scrupulous accuracy, whatever might be the process by which they decided on relative dimensions? And in the next place, and, after all, supposing that they are to be, indeed, credited with such astonishing conscientiousness, is there reason to think that any real advantage would accrue therefrom? It may, indeed, be still further a question whether, if the practice of the Greeks was in their particular circumstances both possible and advisable, it may be advisable and good for us to attempt to follow their footsteps in this direction. But this consideration may stand over; it is due to their great and merited authority that we should do our best to verify what their system was, and what was their own appreciation of its importance and the importance of its minute application.

Certainly there is great preliminary difficulty in conceiving how minute accuracy, such as that of our example, can be of any real value under the conditions of the case,—even in the clearer Grecian atmosphere, the comparative smallness of even their largest structures, and the sharpness of the Pentelic marble which they employed in them throughout. Is there any reasonable ground for ascribing to the sense of sight, marvellous as the faculty is, a power of appreciating differences of dimensions by special pleasingness or the reverse, with a delicacy that would more than rival the discriminating power of the musical ear?

When two musical notes sounded together are produced by concurrent sequences of vibrations of the air, which are so related that the third vibration of one is constantly coincident with the second of the other, a pleasing effect is produced which we call consonance. No one supposes that our pleasure on such occasions is due to recognition of this agreement in proportion. The fact of such agreement is only to be made evident by careful experiment. The vibrations which are propagated from a pair of strings travel to the ear together, and their periodical coincidence produces satisfaction in the absence and independently of explanation, and a musical ear is offended by the fact, not by the scientific knowledge, of the minutest failure in preciseness of proportion. The bâton and the glance of Costa give sign when a semitone is false amidst the stormy melody of a full orchestra; but it would seem that the case must be very different with impressions which are propagated by vibrations, not of air, but of the luminiferous ether, and affect the eye concurrently from proportionate visible quantities. The eye has difficulties in responding to proportions which the ear is not troubled with.

The height of the Parthenon, from the line of step to the apex of the pediment, is proportioned to the breadth of the step, or stylobate, as 7 to 12; 12 : 7 : : 101·341 : 59·115 ft. The measured height (59·127 ft.) differs from that which is so brought out proportionately by the utterly insignificant dimension 0·012. But let this façade be seen in oblique perspective, when the stylobate would be foreshortened visually, as indeed it would be as most frequently seen, and what is then to become of any precise visual proportion? And even if we suppose the spectator to take up position directly in front, the visual angles under which he would receive impressions of height and breadth would be entirely different from, and therefore would entirely confound, the proportions of the dimensions as measured.

Let us take a still simpler example in another form. The height of a spire is precisely equal to that of a tower which it surmounts; any value which there may be in such equality may be expected to tell when we inspect a geometrical elevation, or when we view the structure itself from a very considerable distance, or from a station which brings the eye to an exactly intermediate level. But when it is viewed from any of the nearer and lower points of view which are chiefly to be considered, the upper division will be seen under a smaller visual angle than the lower, and the proportions of these angles will vary constantly as the observer shifts his position. What then, we may again ask, becomes of any value of approximation to equality of dimensions even within a foot or two, to say nothing of scrupulosity as to the fraction of an inch? Why may not the designer reasonably set aside respect for definite proportions altogether, complete his design by "scowl of brow," and settle dimensions for working drawings by scale of feet and adherence to the accepted divisions of the foot-rule?

If hesitation is felt in giving in to this conclusion, it will probably be on the part of those who, rightly or wrongly, are convinced that it was not so that the great designers of antiquity and (in their degree) of the Middle Ages also, worked, and that, considering results, it is scarcely safe to put aside the process which attained these results because we are incompetent to evolve the innermost secret of its importance. The stand which may be made on this line of defence is not to be treated contemptuously. We come here to the discussion not of the value of a theory in the first instance, but as to the matter of fact whether a theory was employed at all. If it is but in rare instances that Gothic architecture emulates the precise finish of the Greek, there is no lack of evidence in favour of a progressive consideration for systematic proportions, as when a preference appears for a triforium to be made just half the height of the clearstory in a bay, and both together just half the height of the central aisle; an arrangement which brings out a proportional sequence of 1, 2, and 3, between triforium, clearstory, and opening to the side aisle.

In the *Builder* of 12th June, 1880, p. 737, the interior dimensions of Henry VII.'s Chapel are given as,—length, 103 ft.; breadth, 35 ft.; height, 60 ft. It can scarcely be by accident that these dimensions are in continued proportion,—that the breadth is to the height precisely in the same simple proportion as the height to the length, viz., 7 : 12,—a proportion which, curiously enough, has other applications in the Parthenon besides that which has been quoted,—

7 : 12 : : 35 : 60.
7 : 12 : : 60 : 102·875.

The full demonstration that a system of proportion was employed by the architect of the Parthenon, and of his mode of applying it, would require the reduction to form of materials for a treatise which is now not likely to be written. The appendix to Mr. Cockerell's "Bassæ and Ægina" gives the general lines of the argument. It is enough to say that candid controversy is not likely to extenuate the significance of such a fact as that, in a building so pre-eminent for dignity of proportion as the Parthenon, no systematic regulation of dimensions by the foot-rule can be established, while adjustments by direct proportion meet us everywhere. To take one example,—the normal eastern abacus of the column is exactly one-fifteenth part of the breadth of the stylobate, and in this manner has a covert relation to the sum of eight diameters of columns and seven intercolumns which complete the plan of the portico. The stylobate measures 100 Greek feet, and it might be thought that 6⅔ such feet would be a convenient dimension, and near enough for proportion; it was not so thought, however, by Ictinus, and instead of the simple 6·50, he chose to take the trouble to adopt the accurate fifteenth, or 6·66. If any architectural member whatever might seem to invite adherence to one settled dimension, it is the abacus. Yet on the western front it is varied, and again by a recognisable proportionate adjustment.

It appears, therefore, that if these questions are to be made matter of controversy, the parties to it are likely to confront each other as advocates of these incompatible theses. On one part it will be maintained that the employment of a precise and systematic scheme of proportion would in no way assist,—in fact, would hamper,—the designer, and so far be detrimental to beauty of design, and therefore could not have been an instrument of such masters of design as the great Greek architects.

On the other part we should hear,—As it can be positively made out that the Greeks of the best time did employ a scheme of proportion in the final adjustment and scrupulously exact execution of their designs, the presumption from their success is decidedly in favour of the importance of such an instrument, if we moderns can only recover and master it.

This latter view is, in any case, consistent with what all will acknowledge,—that in architecture, science and art join hands; there is a scientific element in all arts, but in architecture especially is the union conspicuous, inevitable, salutary. Architecture, however, in its noblest forms, is still, is ever, an art specifically; and science must be content to occupy an ancillary position, with so much self-respect as not to endure being jostled aside into insignificance, if also with so much modesty as not to pretend to undertake the functions of imagination and to oust her from her chair. Architectural science has some cause for complaint in having been gratuitously called upon to disown any such presumptions and having to struggle against unauthorised imputations which are advanced in prejudice of her most legitimate claims. It is too often assumed, by doubtless unintentional injustice, that those who earnestly hold that there is an important place in architecture for a systematic theory of definite proportions, imagine and inculcate that a student, when equipped with such a formula, is prepared to decide the dimensions of a few leading lines of his proposed building, and then to expect the other proportions to follow as a matter of course. No theorist who is sufficiently sober-minded to be worth attention entertains a notion so preposterous: he would be quite as ready to assert that when Beethoven had decided that his key should be C sharp minor, and made progress with some half-dozen phrases, his sonata was so far a finished work that any accomplished contrapuntist could complete it as well as himself. He would be quite as ready, or rather quite as little ready, to propound that, when a painter had resolved on a certain key of colour, and set his palette and put in a few leading tints, difficulties were at an end, that imagination might go to sleep and beauty be trusted to evolve itself mechanically, to come out like a conclusion worked by Professor Jevons's logical machine.

What inevitable guidance may be involved in the adoption of certain leading proportions would seem at most to be of the scope and nature of those which the painter submits to when, having deliberately committed himself to certain conspicuous tints, he has thereby bound himself to keep the rest of his colouring in harmony with them as best he may, and, in considering how he may best, has to arbitrate among the artistic advantages of a variety of competing stratagems and combinations. The very selection of these dominant tints in the first instance is not arbitrary in any loose sense. It is in virtue of capacity for a lively conception of a suitable and expressive treatment of his subject, that proportionate combinations are recognised as emergent from the very subject itself; a certain harmony, a generative ideal, is begotten, so to speak, in his mind, and his problem is to realise it by working out the more recondite relations which are ultimately involved, but do not spontaneously declare themselves. The problems involved in the adjustment of proportionate forms by the architect are in strict analogy to those of duly balanced, relieving, contrasted, and generally related tints and tones in painting, and even of schemes and stratagems of composition. In how many a fine Italian picture, in how many a group of a Holy Family, do we observe the affection of the master for a triangular grouping, "the principle of the pyramid"? We may number example after example in the National Gallery alone; and how little way does the adoption of the principle advance a mere imitator to the position of a rival? Even so we find that while an identical proportion governs the ground-plan of both Parthenon and Theseum on their largest lines, their subsequent proportions are divergent with a decided ultimate contrast of effect.

The controversialist who should take the side of systematic proportion in architecture might be excused for confidently expecting to be allowed to insist on the well-known analogy of music; but here, again, he is stayed in his exposition, and surely to his very natural surprise, by a previous question, by what seems to have become such in this all-questioning age; whether, indeed, the proportions which are established between the notes of the accepted musical scale are not in the main arbitrary, and might not have been very different indeed, and quite as reasonably might not have been almost anything if it had happened to so please the original framers of a scale which, getting an accidental and unnatural start, has usurped authority, and imposed upon us a system which satisfies our ears indeed, but only by mere force of early and inherited habit. A suggestion such as this is serious and startling indeed. Somewhat is here involved which affects the entire scope of art; for music is the very citadel of those who hold that the foundations of genuine art lie deep down in the ultimate unity of nature, in the established relation

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between our human nature and the universe around us, the laws of nature which are not more around us than they are within us. But the detailed and specific analysis of the natural basis of the musical scale would probably be out of place in the *Builder*. It is enough that it should be well understood that there are not wanting those who, in response to a challenge, would hold themselves bound to prove that, on the simple basis of two perfectly familiar physical laws, the musical scale of civilisation is deducible as being necessarily and inevitably such as it is in every particular, such and no other.

The word "controversy" has slipped into our exposition; but the purport of this is to state the question of proportion clearly, not to argue it out. And the expression is better left aside even when argument begins; it is better forgotten in the spirit of one of those paragraphs of Laurence Sterne, which make us tender towards his many lapses in more matters than good taste:—"So often has my judgment deceived me in my life that I always suspect it, right or wrong; at least, I am seldom hot upon cold subjects. For all this, I reverence truth as much as anybody; and when it has slipped us, if a man will but take me by the hand, and go quietly and search for it, as for a thing we have both lost, and can neither of us do well without,—I'll go to the world's end with him." Whether it will be necessary to go quite so far in the search for a complete elucidation of architectural proportion may happily be doubted, but it seems premature to expect that we are at present very close to the end of our journey.

THE CITY OF THE CALIPHS.

The reasons are more than historical which explain the peculiar artistic wealth and beauty of Cairo. It is not alone that Egypt in the past was, as it still continues to a great extent to be, the centre of the Mussulman empire, India, Persia, and Spain being but its extremities; it is not alone the fact that the rule of the Moslems is still exercised by the banks of the Nile, as it has been in unbroken succession since the first years of the existence of the Mahometan religion; it is not alone this fact from which it results that the whole history of Arab art can be traced in Cairo as it can be nowhere else; it is not alone due to the splendour of the court of its Mediæval caliphs and their wealthy subjects, or the architectural zeal of its pious rulers; Cairo, as a great rallying-point of the pilgrims who now for centuries have yearly visited Mecca, has at all times thus enjoyed the peculiar privilege of receiving within its walls, often as permanent residents, the artists and artisans of almost every portion of the Mussulman empire. Those who have closely studied the art of the Arabs, not only in its architecture but in the kindred arts, are able clearly to trace to this foreign admixture not a small influence in the artistic activity of the Egyptian capital. The Arabs, it may be remarked, have at all times been dependent on others for their artists and artisans. In the earliest days of their existence as a nation in Egypt they were entirely dependent for their architects and builders, even for their very materials, on Greek and Byzantine aid. Two centuries after the foundation of their religion, the great Mosque of Hassan, the earliest and, in its untouched splendour, the finest creation of pure Arab art, is the design of a Christian Copt. To this day, Lane tells us, the best builders and carpenters are invariably Copts, whose manual skill and superior dexterity have always been appreciated by the Arabs. But this dependence on others for their executive skill in no way thwarted, as might be imagined, the peculiarly original bent of Arab artistic genius. No art can be pointed to as more thoroughly the creation of those environing circumstances which, it has been urged, are the invariable influential factors in the art of every nation. In no feature is the originality of the art of the Arabs, acting under the influence of their daily needs, more clearly shown than in their domestic architecture, of which, after having hastily referred to the religious architecture,* it may not be uninteresting at the present moment to speak.

The domestic architecture of the Arabs is especially well represented in Cairo, as that city was, during the most brilliant period of its history, the capital, inhabited by a refined court. This period is contemporary with an age which we in Europe usually associate with the twilight of the Middle Ages, stretching as it does in contemporary English history over the period of the Conquest and the even ruder days of our last Saxon and Danish kings, the Crusades, and the still uncouth epoch,—however exquisite may have been its artistic creations,—of the Scotch and French wars of the three Edwards. Two centuries after its foundation, that is, in the ninth century, Cairo,—or more properly, Fostat, "the old city,"—under Mamoun the learned, the son of the famous Haroun al Raschid, was an active centre of learning and refinement. Mamoun founded a famous school of *savants*, whose studies embraced not alone astronomy and jurisprudence, but the natural sciences, chemistry, and algebra, the Arab names and terms of which we have to this day retained. It was Mamoun who measured the first terrestrial meridian, and to his reign we owe those Arab translations of Greek, Hebrew, and Latin authors, without which we should know nothing but from hearsay of many of the greatest classic writers. With the conquest of Egypt by the Caliph Moezz, and his foundation, in the middle of the tenth century (A.D. 969), of the existing city of Cairo, the splendour and refinement of the capital were carried even further. Its commerce was extended to the furthest extremities of the Mussulman empire; Cairo suddenly became the most important city of the East. In their wealth the caliphs revelled in the wildest dreams the "Arabian Nights" have pictured to our Western minds. The prohibition of the Prophet respecting the representation of animate beings, respecting gambling and the use of wine, were disregarded, and to these days of Arab splendour belong some of the choicest relics we possess of the art of the caliphs. Some slight insight into the luxury of the rulers of the time has been afforded by the publication in these pages not long since, of the inventory of the Sultan Mostanser's treasury,* and this lengthy list of costly marvels was, it must be remembered, but a portion of the contents of the royal palace. In Cairo and Damietta the looms were busy with the production of the most gorgeous stuffs, further enriched with the costliest embroideries. The goldsmiths and armourers found their most exquisite products never sufficiently choice for their fastidious clients.

In the midst of such a refined existence, and with surroundings so elegant, the character of the domestic architecture, it can be imagined, was scarcely less decorative. No wealth was too great to lavish on the interiors of their homes, where gilded and painted wood-work in delicate arabesque contrasted with the deep blue of tiles of the choicest design and hangings of the richest fabrics, floors of marble and mosaic covered with thick carpets, each marvels of decorative beauty. The wood-workers exhausted their utmost art in inlaying ivory and mother-o'-pearl and tortoiseshell in the most intricate incised designs; the simplest utensils were plated or damascened with gold and silver as richly as the goldsmith's art could devise. The choicest perfumes, of which the consumption appears to have been immense, were brought from the furthermost corners of the earth, and the poets of the day, in defiance of the Prophet's commands, sang in the sweetest strains that the Arab tongue has known, the praises of love and wine,† while in the description of their gardens the poets have been scarcely less ecstatic.‡

Sumptuous as were their interiors, no display of all this wealth was allowed to be even suggested by the exterior appearance of the house. Shrewd motives suggested this custom (one that gives its peculiar character to all Oriental cities) as calculated to allay the too familiar cupidity of the ruling powers or the violence of the populace. Bare grim walls, pierced by a few small grated openings, and, in the older houses, the doorways strongly protected by loopholes and overhanging machicolations, are all that present themselves on the exterior of many of the wealthiest and most delicately decorated of the old houses of Cairo.

Something of the splendour of the life of the Arab caliphs,—the contemporaries of our Templars,—may be judged by the following interesting description of the visit of an embassy from the Crusaders to Cairo, a description which, taken from the pages of the faithful old chronicler, William or Gulielmus, archbishop of Tyre (with whose pages Scott was so familiar), may not unprofitably be set beside the almost contemporary inventory given by us of the Caliph Mostanser's regal treasury:—"As the house of the prince is of a splendour such as has never been in our time seen, we will here relate with care what we have learnt from the trustworthy report of those who were present concerning his splendour, his incalculable wealth, and his extraordinary magnificence, for on this point it may not be uninteresting to possess some information. As soon as Hugh, of Cæsarea, and with him the Templar Godefroy, arrived at Cairo as ambassadors to the Sultan, they were conducted to the palace by a great number of servants, who preceded them noisily with swords, through narrow passages and dark rooms, where, at each entrance, troops of armed Ethiopians loudly acclaimed the Sultan. After having passed the first and second guard, they reached larger rooms, to which the sun penetrated; porticos supported by marble columns, gilt ceilings exquisitely decorated, and walls tiled in the most regal splendour. The whole was so beautiful, both in execution and in material, that the envoys could not avoid feasting their eyes on these marvels, the perfection of which surpassed all that they had ever previously seen. There were marble tanks filled with the clearest water, birds of every species and of varieties most strange, of divers voices, forms, and vivid colours, and especially marvellous to our compatriots. Thence some eunuchs led them to other chambers which even surpassed the first in beauty as much as they had done all that they had ever seen before. Here there was an admirable multitude of different quadrupeds, such as the most capricious brush of the painter, the licence of the poet, or the mind lost in the dreams of night, could alone create, such as the South and the East produce, and the West has never seen, and of which it but rarely ever hears mention. After many windings through various rooms, each of which contained ample to stay the attention of even the most indifferent, the envoys reached at length the royal castle, where an immense crowd of armed troops and satellites showed, by their number and costume, the incomparable glory of their master, and where every feature showed the wealth and unlimited treasures of the possessor. When the envoys were admitted and introduced into the interior portion of the palace, the Sultan rendered homage to his master, in a manner such as never person elsewhere had shown. As he bowed for the third time, laying down the sword which hung around his neck, the curtains, thickly embroidered with gold and choice pearls, draped about the throne in the centre of the room, parted with incredible rapidity and displayed the Caliph. His face was unveiled, and he sat in a pomp of costume more than regal on a throne of gold, surrounded by a small number of attendants."

Our English troops have occupied the citadel which Saladin built, the scene of all the marvels above described; but of the fairy-like courts which dazzled the Crusader ambassadors nothing but the tradition remains. Successive rulers have each left their mark on the palace fortress, and hand in hand the work of time and the work of man have aided each other in their mutual task of destruction.

The wealth of Cairo and its artistic activity lasted all through the thirteenth, fourteenth, and fifteenth centuries. At the close of the fourteenth century we have the evidence of the Florentine Frescobaldo, so Ebers tells us, that there were more ships in the port of Cairo than at Genoa, at Venice, or at Ancona. The sultans of Egypt were regarded as the wealthiest monarchs of the earth. Cairo during these generations was, indeed, the city of the "Arabian Nights," whose fairy tales the *improvisatore* told about the streets. With the close of the fifteenth century the trade and wealth of Egypt received its death-blow by the discovery of the Cape of Good Hope by Vasco di Gama, and with it the southern route to the Indies. Stoutly as the Arabs fought to defend their monopoly of the Asiatic trade, the age of maritime discovery had commenced; English influence on the oceans of the world was beginning to make itself felt,—the golden days of the

* See pp. 389, 452, *ante*.

* See p. 297, *ante*.

† By a somewhat grim piece of irony, our word alcohol is of Arab,—that is, Mahomedan,—origin.

‡ Carpet-gardening, that modern abomination, was, it appears, not unknown to the Mediæval Arabs, as we have mention of inscriptions being written in flowers.

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classic Mediterranean were counted,—the untracked Atlantic was to draw trade into new channels, in which it has since never ceased to flow.

SIR EDMUND BECKETT ON ART, ARTISANS, AND ARCHITECTS.

It cannot be doubted that in many cases a discourse upon any subject whatever is liable to suffer serious injustice in a summary. Compression is apt to be destructive to gracefulness; it may even involve displacement and dislocation of the whole framework of an argument, and if clumsily performed, though with the very best intentions, may deliver it at last as incapacitated for defending and sustaining itself as if it had been systematically strained into distortion upon the rack of analytic controversy. And yet is a summary constantly no ill test of the coherence and cogency of an argument; of the validity of enunciations which are involved in the flourishes of rhetoric, or in taking plausibilities of fine writing which more bluntly challenge assent authoritatively by a string of dogmas that have as little to do with each other as with the conclusions which they profess to guarantee. It is less than usually perilous to criticise the views of Sir Edmund Beckett on science and art, reported as they are in our columns. The features of this report of what was said at a distribution of prizes to the St. Alban's School of Science and Art are sufficiently marked and characteristic to fully justify an attempt at interpretation.

When a greater novice at the Bar commenced his pleading with nervously repeating,—"My unfortunate client!" and then made a pause, a judge gave him the encouragement, such as it was,—"Go on, sir; pray, go on. So far you have the Court entirely with you." And Sir Edmund takes us with him quite as cordially when we read his introductory words:—"I must confess that I am in a state of extraordinary ignorance on the subject. Science is a very good thing, and art in its way a very good thing too. But I am afraid that the meaning of both words is a good deal less understood than it should be."

After these statements of the general principle, we have not long to wait for a particular example. What knowledge of art and what apprehension of the meaning of the word "art" may we discern in talk to this effect? "Art, if it means anything, means the art to do something; it may be a good or a bad thing." Who will not willingly make a present to the author of the definition of the art which means doing something bad? We may as reasonably define surgery as the art of performing operations which either correct or aggravate deformities; or perspective as the art of putting objects into perspective, either correctly or incorrectly. We go on to read, "The word 'art' may come to be associated by usage with a beautiful thing, or with what people call beautiful; but it is very difficult to say what is beautiful." So far, at least, we escape a definition of beauty to pair off with that of art. But we are left with the implication that whatever beauty may be, if, indeed, it is a reality at all, the association of the idea of it with that of art is accidental; the two have come to be associated by usage in a vague and ignorant way, no one knows why, and the speaker evidently least of all suspected that the usage was the inevitable outcome of a necessity to express in language an experienced connexion between matters of fact,—between exercise of the human faculties with a specific purpose, and a successfully-realised result in evoking the sentiment of the beautiful.

"There is no canon of beauty that I know of,—no rule except following the example of Nature. There is no unquestionable standard of beauty except Nature." This is promising; but no: nature proves as slippery as art, and the standard proposed is elasticity itself. "Nature never copies herself; there are millions of leaves on the trees, but I defy you to find two alike." He had endeavoured to impress this lesson upon workmen at St. Alban's Abbey, and upon others whom he had found too much given to imitation, and he had advised them to use a little more freedom. The advice is sound so far as it goes, but what becomes of the unquestionable standard as provided by ever-varying nature? The workmen are at last referred to some principle of selection which is not prescribed by an external norm. If the leaves of a sculptured oak wreath are not to be repetitions of a single model leaf, are they to be varied by copies of a number of model leaves? Even so the selection from the millions which are upon a single oak will not be guided by any standard that the natural oak supplies; the standard will be brought to the oak by the selecting artisan, and every different selector will make a different choice,—each by a standard of his own within his own mind,—better or worse; but it may be suspected that in the best wreath not a single leaf will be found to conform with precisenes to a single model among the selected. We are carried, therefore, to a very different point of view from that which confounds art with mere manual dexterity, and restricts the title artist to the ultimate manipulator of even the designs of other people. "It seems to me," said Sir Edmund, "that an architect is not an artist. An artist must do something with his fingers; he does not work with his mind only. An architect does not do anything with his fingers; he merely makes drawings [with no help from his fingers, Sir Edmund?], and tells other people how they are to do the work." So the architect, not without some natural surprise, finds himself landed one stage lower down than the bricklayer, or even, it may be, than the hodman, who does, indeed, do the architect's work going up and down a ladder as he pities the artist whom the architect is enjoined to venerate as his superior,—"the man at the top who takes the bricks and does all the work." What may have been the average age of the pupils of the School of Science and Art whom Sir Edmund Beckett was addressing we do not know, but we are glad to think that if his audience included a fair average of artisans, including carvers of the ornamental work at St. Alban's Abbey, his compliments would have been repudiated as fulsome by a silent protest of more than one or two. Speaking ever with the truest respect for the competent art-workman, the question is very unworthily revived as to the comparative merits of the composer of the overture and the conductor of the orchestra or the boy with the triangle,—between Handel at the keyboard and the indispensable man at the back of the organ doing his duty manfully at the bellows.

But, in truth, our complaint against Sir Edmund Beckett in this extraordinary deliverance is the same otter-like quality that Sir John Falstaff imputed to Mrs. Quickly: he "is neither fish nor flesh; a man knows not where to have him." He begrudges architects their claim to be artists, and disparages the importance of their work in comparison with that of an ornamental carver. Yet what is the worth and significance accorded by him to the title after all? A number of people, we are told, claim the title of artists with much better claim than architects. "Painters and sculptors are artists,—there is no doubt about them." Opera-singers, actors, and, "a little further down," hairdressers are adverted to rather ambiguously as, perhaps, having no more claim than architects to an honourable distinction; but the claim of dressmakers seems to be viewed more indulgently, while tailors are admitted to a common guild with sculptors and painters in a tone of warm cordiality. "Dressmakers are frequently called artists, and I know also that tailors are called artists. So they ought to be, because they produce very excellent results, and I am not sure but that when they have good subjects to work upon, they produce more successful results than architects generally." There is confusion here between "artist" and *artiste*; a very different thing,—different as a commissioner from a *commissionnaire*,—but let that pass; let it pass with congratulations to Sir Edmund on his good fortune in a tailor. What it would be interesting to know is, even in this example, his precise allocation of the coveted title of artist? With the guidance afforded us this lies open to contest between the constructor of the brown paper pattern, whose function has a dangerous analogy to that of the producer of working drawings, and his cross-legged colleague of the thimble and sleeve-board.

Our interest is chiefly with art, but if we can obtain any light on science incidentally, and as correlative to art, we may give it welcome; it is in making the best of such an enunciation as follows that our chance lies on the present occasion:—

"The real distinction between science and art is that art is uncertain, while science is certain,—or ought to be certain. Science is simply a fine word for knowledge, and knowledge is certainty, or such certainty as is to be achieved."

Too true it is, alas! that there is more uncertainty in matters of art than is desirable, but even in this statement it does not compare very disadvantageously with science,—with science that "ought to be certain," that gives us, not certainty, but only the best approximation to it that is to be got,—and that, being progressive, may give us a surprise any day. When we look back through the ages and contemplate the realised wealth in art which the world has possessed, and which in such important proportions is preserved, and that we rejoice in the possession of,—Sir Edmund Beckett must allow us to say when we recall how much of that wealth of art we owe to the genius of architects,—no feeling comes upon us of the unreality of our possession, of uncertainty as to the truth and beauty of the achievements of at least our predecessors. A foolish story is told of a mathematician,—one after another great name has been belied by the ascription,—having asked contemptuously what a great poem proved. Sir Edmund Beckett, by direct implication, assumes that works of art, and of architecture especially, do not not prove anything,—are afflicted with the essential weakness of wanting that certainty which in one fashion or another he makes, to speak logically, the formal or distinguishing part of the essence of the species science. But a great work of any art,—a work which establishes and approves itself as a great work, has a value not only as art, but in science also. It does prove something, and proves a great deal. It is a phenomenon which demands, and will reward, study, a fact illustrative of mental and moral revolutions which concern us quite as closely as the theory of earth tremors or of the aurora borealis. Nor is art without a retort upon science. It is the hope and happiness of the world that the world is accumulating scientific truth as well as artistic beauty; but it is notorious, and admitted by none more readily than by the scientific, that every age achieves renown by demolishing a mass of the scientific, or rather the unscientific, fallacies of its predecessor; that it also as unfailingly commits itself to a series of new misconceptions which only make the originators renowned to give a basis of greater renown for those who come after and expose them. One age held as a certainty that Nature abhors a vacuum; who shall say that the men of science who laugh at this dictum will not some day themselves be laughed at for having made too much of the principle that Nature delights in differentiation?

Sir Edmund, with a candour that does him credit and a simplicity which affords others innocent amusement, professes that he does not know for what reason architects wish to call themselves artists. "I have had a good deal to do with architects," he says, "and always found that for some reason or other they wish to call themselves artists, though I have never been able to make out why." It is always pleasant to be able to satisfy intelligent curiosity. The reason is this: it is only in virtue of having a just claim to the title of artist that one is justified in even pretending to be an architect, as distinguished from a builder or a contractor,—creditable titles both, but by no means committing their possessors to the serious responsibilities involved in a profession of fine art. Is it necessary to render these distinctions a little clearer? It would seem so, by the strange confusion of ideas implied in setting forth art and handiwork as convertible terms. The usage of the English language provides us with the words of cognate import,—"artisan," "artificer," "art-workman," "artist"; the last has superseded a somewhat awkward word, "artsman," which was in use by Lord Bacon and dramatists contemporary,—by Shakspeare and Ford. *Artiste* also, with the French pronunciation, may be considered to have been naturalised in England under the same pressure for requirement of a special term which has given us the indispensable *envelope* and the expressive *prestige*. It would be in vain to attempt to tie down these terms to strict definitions and mutually exclusive significations,—as vain as to pretend to attach them to absolutely divided classes of individuals. It is enough that we are guided in our appropriation and qualified application of them by regard to one leading consideration, the proportion in any given case in which manual dexterity is exercised under command of prompting mother-wit, of original

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creative imagination. There are, of course, gradations of skill, and therefore of dignity, among the functions which are equally remote from demands on proper invention; but a special measure is required for every particular comparison, be it of carpenter with cabinet-maker, of mason with the sculptor's assistant who reproduces in marble the clay model furnished to him with the accuracy of a cast. When a wood-carver sets up before him the most carefully-executed drawings as his model, he may still throw so much individuality into his work while still within the prescribed bounds, as to evince originating power, and so far to claim to be more than a mere art-workman,—to be to that extent an artist. It depends on the value of the result whether his claim is better or worse than that of the carver at St. Alban's, the typical artist of Sir Edmund Beckett, when under suggestion he tries his hand at making the foliage which he is at work upon less servilely imitative. Grisi, in days now almost days of yore, sang every note that the composer set down for her,—those and no more,—while Madame Persiani was scarcely to be restrained in her exquisite embellishments; and yet was "La Diva" the greater artist, in virtue of the vigour of her sympathetic spirit and the unprompted graces of her expressive acting.

If the best works of architecture that the world possesses can be shown to have none of the characteristics of fine art,—to owe none of their value,—not, indeed, to owe their chief value,—to refined and appropriate expression, as graceful, as elegant, as beautiful,—nay, as sublime,—then is architecture, of course, no fine art at all, and architect and artist are inconvertible or contradictory terms. But otherwise, whatever may be the matter of fact in particular instances, and no one wishes to restrict the right of critics to have decided opinions of their own, there is assuredly the best reason in the world for that honourable aspiration to the title of artist which critics as independent as need be, and quite as disposed to be critical as they should be, are happy to think may be pronounced even in our own day to be abundantly justified.

FOOD FOR THE MILLION AND HOW THE PURCHASERS ARE CHARGED.

The question of the provision of sea fish for the food of the people is one that has again and again been mooted in our columns. It is the opinion of those who have deeply studied the subject that the influences which have hitherto kept down the supply of a cheap and nutritious article of food are not such as altogether court the daylight. We have heard complaints of the railway companies; complaints of the fish-curers; complaints as to the dangers of the sea; complaints as to monopoly of market. But never yet, so far as we are aware, has the matter been fully discussed on unquestionable *data*. The production of these *data* is one of the incidental advantages for which we have to thank the Select Committee on Railways. We shall be very much surprised if much of the information elicited by, or volunteered before, that committee has not a very different effect from that which was contemplated by those who offered the evidence. That such must be the case with regard to the evidence offered as to the cost of the grades and mineral stations on railways there cannot, we think, be the least doubt. In this case, however, we have to call attention rather to an accidental than to a direct outcome of the evidence.

The price at which railways carry fish is one of the points as to which much has been said, both *pro* and *con*. In perhaps no respect, except with regard to the carriage of passengers, is the speed attainable by the railway so directly important as with regard to the carriage of fish. Distances are long; speed, if a full load is made up at the shipping points, may be to a great degree uninterrupted; and on all the principles which have been lately advanced by the managers of railways as arguments for reducing charge (except that of sea competition), the remunerative cost of a full fish-train ought to be as low as that for almost any article of transport.

What is actually done is this. A ton weight of fish, according to the evidence of Mr. Robert Barclay, of Montrose, is carried 526 miles by the fastest trains in the world for 3*l*. 15s. This is at the rate of 1·7d. per ton per mile; and considering that the fish-train must return empty, or nearly so, is, we think, quite as low a price as any railway company can be expected to charge, unless, as in the case of the fishing-boats, a "bounty" were paid for the train by some of the capitalists interested in the trade. Between the deep sea to the north of Scotland and the London dinner-table the railway train is as essential a link in the communication as the net of the fisherman himself. And when we come down to the unit of retail purchase, the pound, we find that less than one halfpenny, or, more exactly, 13 thirty-seconds of a penny, represents the cost of railway carriage.

What do we pay for cod, for it is to cod that these calculations chiefly refer? Seldom, if ever, less, often we think more, than 1s. a pound. Towards this the iniquitous charges of the railway company make up, as we have seen, less than one halfpenny, actually 3·3 per cent. of the shilling! How is the rest made up?

The person who hands the fish to the railway company is the curer,—a small local capitalist, or, at all events, a local capitalist, whether small or large. His outlay consists in providing boxes, and boxing the fish (for which he pays at the rate of 9d. each, over a standard size), besides making an allowance, or bounty as it is called, of 14*l*. per boat for the season. Besides this he pays 3d. per cwt. cost of carriage across London to Billingsgate, and carriage of box to London, with a small return charge for the same. His receipt for this (of course not including the railway freight) is 5s. per cwt., or 17 thirty-seconds of a penny per pound. So railway and curer together do not come up to quite 1d. per pound for their share in the 1s. paid by the housekeeper.

The reader will now come to the comfortable conclusion that it is the fisherman, the bold and hardy mariner who provides boats, mans them, goes out, often with his life in his hand, and catches the fish, who has the lion's share of the shilling. Alas, no! He only makes up the even 1½d.,—only receives for his own share 5s. 3d. per cwt. or 18-32nds of a penny per pound! And so fisherman, and curer, and railway, and carriage across London, all together, only come to 1½d. per pound. Who has the other 10½d.? And what are the services that he renders to the public for seven-eighths of the whole retail price of the fish?

The reply to that question was not brought before the Committee on Railway Rates. It is one which the purchaser of fish may, it seems to us, with some reason, rather loudly demand. Who gets the 10½d. per pound? Who gets, and for what service, twenty times what the fisherman receives for his perilous toil? There is, or at all events there used to be, such a thing as a sense of justice,—as a measure of proportion, on the determination of retail prices. But here we have something so outrageous as to be incredible, on any less unquestionable an authority than a Blue Book. A halfpenny out of the shilling for the fisherman, a penny more for bringing the fish from John o'Groat's to Billingsgate, and tenpence halfpenny for bringing it from Billingsgate to the dinner-table! Is this to be tolerated? Again, we know that the price of fish is subject to great and sudden rise, in case of stormy weather. Less then comes, no doubt, to the market. But does the fisherman get more? We doubt it. As far as the evidence before Parliament goes, he takes the rough with the smooth, and only gets 9d. per cod whether he brings in more or fewer. If on any of the other fishing stations there is a variation in the price, we may be tolerably sure that the fisherman gets anything but the lion's share of the augmentation. If his prices were doubled, it would not affect the cost of packing or of carriage. We should have cod brought to London for 2d. a pound instead of for 1½. But is it not out of the way for us to pay 1s. 6d. for the same, on account of stormy weather?

It really does seem as if this was one of the abuses which can hardly be maintained after it is dragged into the full light of day. We saw, some little time back, how the Londoner was benefited by the conduct, — at once businesslike and patriotic,—of a noble marquis, in selling his own coal. We should venture to suggest that any patriotic Scottish nobleman who should put himself at the head of a movement for enabling the fruit of the toil of Scottish fishermen, which comes to London for 1½d. per pound, to reach the fish-kettles of the mass of the London population at something like a proportionate price for the trouble and risk of retailing, would ensure a double popularity. Whatever were the gratitude felt by the fishermen and their families,—a gratitude that might very likely be stimulated by the reception of something more than the present pittance for a perilous toil,—we think we could answer for the way in which the movement would be hailed by the London householder. Best cod at 3d. per pound would be a welcome and a health-giving addition to many a table. And who shall say, in the face of the above evidence, that 3d. a pound does not leave an ample margin for the retailer of fish?

CHRISTIANITY IN BRITAIN IN ROMAN TIMES, WITH REFERENCE TO DISCOVERIES AT ST. MARTIN'S CHURCH, CANTERBURY.*

The subject of my paper is one of no small interest in relation to the much-discussed subject of the origin of Christianity in our land. It is no less than a notice of what I believe to be the discovery of a portion of a Christian church erected in Roman times.

I propose to describe the discoveries in detail, but, before doing so, it may be well to make some introductory remarks upon the subject of such deep moment to us all,—the commencement and growth of the Christian faith in our country.

Were we to believe implicitly the so-called writers of ecclesiastical history, Britain must have been well advanced in Christianity when the Saxons landed on our shores. Alas! that it has to be stated. These records,—of later date in all but every case,—bear the attendant stamp of the later date. Fact gives place to fiction, where history is lost in legends so unreal that we have to pause to consider how much is true and how much the results of the distempered fancies of men living too much alone, whose sense of the marvellous caused sober realities to be set aside, or who believed that they were rendering service to the Church by the exaltation of some dogma or some human authority.

So early a date as the year 150 is assigned by the authorities whom Bede follows for King Lucius's request to Pope Eleutherus to "make him a Christian," and this is taken as a commencement of Christianity in England. The dates given do not accord; and the existence of King Lucius at all has yet to be proved.

The Diocletian persecution is a known fact, but there are some real reasons for doubting whether or not it ever penetrated into Britain. At the time the country was under the tolerant government of Constantius, or when the usurpation of Carausius had alienated it from all central rule; and this was followed by that of his successor, Allectus. It is hardly possible that the flame of persecution would have been kindled in our land at the Imperial bidding when no other decree would have been heeded. Nevertheless, more than one chronicler relates the martyrdom of the pious Alban at Verulanium during the Diocletian persecution, when churches were destroyed and holy men were slaughtered.

Alban suffered with all the surroundings apparently inseparable from a monkish legend. The river Thames dries up at his approach to the place of martyrdom, according to Gildas; although Bede's authorities are content to make the miracle occur at the stream between the city and the hill of execution. A spring bursts forth from the spot. The eyes of the executioner fall out!

St. Joseph of Arimathea is said to have settled at Glastonbury; St. Paul to have visited Britain. The King of Britain slays with his own hand hundreds of the heathen Saxons at the battle of Old Bath Hill, his shield being guarded by a statue of the Blessed Virgin!

Thus do the histories of the time, or those written closest to the events, teem with improbabilities, and give reason for the doubt expressed by so close an observer of archæological facts as the late Mr. Thos. Wright, who says, "We seem driven by these circumstances to the unavoidable conclusion that Christianity was not established in Roman Britain"; and again "not a trace of Christianity is found among the innumerable religious and sepulchral monuments of the Roman period found in Britain."†

These are conclusions too hastily arrived at; and antiquaries should ever remember that

* By E. P. Loftus Brock, F.S.A. Read at the meeting of the Kent Archæological Society at Maidstone, Aug. 2, 1882.

† "The Celt, the Roman, and the Saxon," pp. 353, 355.

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their facts of to-day may receive fresh additions and illustrations by the discoveries of to-morrow. The most absurd-sounding of the old legends may contain a germ of truth under their later dress. Strip it off the latter and we obtain the right view of the case. Thus, at St. Alban's we find the appearance of the country,—even to the pool of water,—agreeing with what we can trace there to-day, while the local belief in the reality of the proto-martyr of England is shown by the continued existence of a costly church on the spot named by tradition as that of the Martyrdom. A battle was fought at Bath Hill, and it is very possible that a British chief or ruler was there. The legends of St. Paul and of St. Joseph must be taken with all caution; but their remaining as local traditions for so long a period is a very noteworthy fact. The old historians render evidence, however, of greater weight and importance to our inquiry, bearing, as it does, much of the impress of reality and truth.

St. Athanasius, in the middle of the fourth century, speaks of British bishops being present at his trial at the Council of Sardis. Three British bishops are recorded to have been at the Council of Arles, A.D. 314. Their names have subjected them to questioning criticism, which, if it stood in relation to this event alone, would be worthy of all attention. The fact remains that, as soon as history becomes reliable, we find that British bishops are actually in existence in various parts of our country. There was apparently one see independent of Rome in Cornwall up to the tenth century, when Athelstan, bishop of Bodmin, was consecrated by Archbishop Phlegmond, A.D. 904, and the see became subject to the Saxon Church. We hear of bishops of the British Church early in the sixth century subject to the Metropolitan of Caerleon. The foundation of the Cambrian sees may be lost in obscurity, but their continuance is a fact to this day. From the fourth to the sixth century, when reliable history comes to our aid, is not long; and it is more reasonable of belief that the bishoprics then in existence were but the continuance of foundations of an earlier period, than that they were unrecorded foundations of the later time.

Statements by reliable and contemporary authors, rather than those of later dates, may also be appealed to in a few passages, which I will rapidly glance at. Origen, in the third century, asks, in his Fourth Homily on Ezekiel, "When, before the advent of Christ, did the land of Britain agree in the worship of One God?" Tertullian's well-known statement, "The parts of Britain inaccessible to the Romans are subdued by the truth of Christ," bears the stamp of true history, and is in harmony with the archæological relics.

There is evidence of still another kind in the old histories. Incidentally, we hear of considerable intercourse between the churches of Armorica, Ireland, Cornwall, Scotland, and the north of England. We find this as soon as history becomes reliable, and we may readily believe that this too was but a continuance of something older rather than something of recent occurrence.

The two visits of Germanus, bishop of Tours, to Britain, the mission of St. Patrick to Ireland, and that of Bishop Palladinus to confirm the faith of the Scots,* all point to the existence of Christians in these countries, and at many points of them, and may be accepted as the reason for the existence of such large numbers of British Christians of the sixth and later centuries. We are thus prepared for the congretions in the Banchors of Ireland and Wales, the missions of Columbia and of the Culdas, and for the flourishing Christian churches of the land which appear to be separate and distinct from Saxon England.

The evidence of Christians at an early date is also shown by the rise and progress of the Pelagian heresy. The Church must have possessed a vast number of members, for the errors of the time to be so recruited from their midst; and it may be noted that when Germanus strove so ably to refute the evil, we hear of him not at one spot of Britain only, but at Verulanium, Oxford, and in Wales.

I will now proceed to describe actual relics of early Christian times that have been revealed through the aid of the science of archæology. It may, however, be readily supposed that the extent of Christianity cannot be judged or measured by these. The decay of time may account for the loss of many. Many more may yet remain to be discovered. We may suppose, too, that there may have been many Christians, and but few indications of their presence that could survive to our time. Indeed, there may have been but few outward signs even at the time referred to. "Though we have known Christ after the flesh," says St. Paul, "yet now henceforth know we him no more."

The sentiment was doubtless that of the Church for a long period; and it is quite possible, under its influence, for there to be a large and flourishing congregation of Christians with but few tangible evidences of its existence.

So early as the latter part of the last century, a Roman villa was discovered at Frampton, Dorsetshire. It was evidently a building once occupied by a wealthy owner, for the pavements were of great beauty. On one of these, filling a small semicircular apse, the Christian monogram was found, worked in mosaics, forming a portion of one of the most elaborate of the pavements; while, in another pavement, there is a medallion portrait, with a mild and amiable expression which is recognised by some as a portrait of Our Blessed Lord.

The Chirro is an early rather than a late symbol used by the Christian Church, and its presence in a wealthy Roman villa is a significant fact. The discovery attracted much attention at the time, but being an isolated fact, it was doubted, or believed to be a later insertion. It had almost passed out of memory when attention was again called to it by my friend, Mr. T. W. Grover, in 1867.* This was followed by the discovery, in 1864, of another Roman villa at Chadworth, in the county of Gloucester, — so favoured by the Romans. Here the monogram of Christ was found carved on two of the steps as if to mark the sure foundation of the building. A hexagonal bath, of remarkable construction, is believed, and with very weighty reasons, to have been a baptistery.

Mr. Grover enumerates, among other precious relics of early Christianity, the presence of the sacred monogram on two plates of pewter found in the Thames at Battersea, now in the British Museum, and points to the numerous coins of Constantine, having the labarum, and those of Magnentius with the Chirro. With so many signs of the Christian faith, now in the ascendant, circulating among them, our surprise would be rather if there were no Christians then in our land, instead of at their presence. It can hardly be doubted but that many of these coins were minted in Britain. In addition to these, there exists at Alnwick Castle a Roman urn of the well-known Castor ware. It has the sacred monogram laid on in white slip. I am indebted to Mr. Roach Smith for the reference to this evidence, and he adds that it is the only object having reference to Roman Christianity known to him.

At a meeting of the Society of Antiquaries held very recently, a remarkable discovery at a Roman villa at Fifestead-Neville, Dorsetshire, was reported by Mr. Middleton. Among the excavated remains of the building, two silver bracelets were found. On one was the sacred monogram; it occurred again on the other in slightly different form, with two palm-branches left and right.

I have confined my references to examples that are beyond doubt or question, to the exclusion of many that cannot either now be referred to, or which are of doubtful or of Mithraic import. Time will admit only of passing reference to the Christian monogram on the tomb of Carausius, at Pen Machno, one of a long series of Christian monuments extending quite into the later Celtic style of the Welsh church; and to the Scottish series, which has exactly the same sequence. The Cornish examples go over the same ground, and prove the existence of Christianity from early to late times. The Rev. S. M. Lach-Szyrma has recently called attention to the presence of a monument with Roman lettering, most probably of Christian origin, in St. Hillary Churchyard, close to another of Celtic-Christian style, with others of the Early Gothic period, as illustrative of the continuance of a Christian cemetery on the same spot from Roman times to our own day.

I have briefly scanned some of the salient points of the old chroniclers. There are others in relation to the building of churches, but it may be needful, for brevity sake, to refer to but three of these.

St. Augustine (A.D. 602), "being supported by the king, recovered at Canterbury" a church which, he was informed, had been built by the ancient Roman Christians, and consecrated it in the name of our Holy Saviour, God and Lord, Jesus Christ, and there established a residence for himself and his successors.* This is as direct and clear a statement as can well be desired, made by the most judicious of all our ecclesiastical historians, the Venerable Bede, and from records which are carefully noted in the prologue to this book.† "Traces of the assistance which he derived from Canterbury are perceptible in the minute acquaintance which he exhibits not only with the topography of Kent, but with its condition at the time when he wrote." The finding of a probably-ruined building on the site of the intended new church could hardly have been an invention, while the fact would have been sufficiently noteworthy to be recorded. We may, therefore, conclude that the Roman origin of Christ Church, Canterbury, is an historical fact, as well made out as any fact of such a remote period can be. The men of that ancient city, the cradle of our faith, so to speak, may well congratulate themselves that the sounding forth of Christianity from the cathedral, hardly interrupted from the days of Augustine to our own, had its beginnings at a still earlier date. An historian entirely of another type,—Thorn, a Benedictine monk of St. Augustine's, at the end of the fourteenth century,—records:—"There was, not far from the city, towards the east, as it were midway between the Church of St. Martin and the walls of the city, a temple or idol-house where King Ethelbert, according to the rites of his tribe, was wont to pray, and with his nobles to sacrifice to his demons and not to God; which temple Augustine purged from the pollution and filth of the Gentiles; and, having broken the image which was in it, changed it into a church, and dedicated it in the name of the martyr St. Pancras, and this was the first church dedicated by St. Augustine. . . . While Augustine was celebrating mass for the first time, the devil, seeing himself driven out from the house which he had inhabited for long ages, tried to overturn from the foundations the aforesaid church, the marks of which thing are still apparent on the exterior eastern wall of the above-mentioned porticus." We have in this doubtful-sounding history a good example of the records of the time. The position given for the building is exact. The legend can hardly be believed, but yet it is referred to on the spot now, as recorded 700 years ago. The site is waste, and a ruin only remains there; but in the modern boundary-walls, on the north-east side, a channel in one of the stones was shown me in the summer of this year by the son of the proprietor of the site, as being the veritable claw-mark of the Author of Evil. If the legend has thus survived for so long a time since it was recorded by Thorn, who can doubt but that it may have existed long prior to his time? We owe to the zeal of the Rev. Canon Routledge and the painstaking efforts of this Society singular archæological evidence. The ruins are those of a Roman building.

To refer again to the Venerable Bede, and to the passage so well known to us. "There was on the east side of the city a church dedicated to the honour of St. Martin, built whilst the Romans were still in the island, wherein the queen, who, as has been said before, was a Christian, used to pray." It is in this church that the recent discovery of Roman masonry has been made, which is the immediate reason of my paper.

These three structural records have been referred to so often that I hesitated to bring them forward again. I have done so, however, since they have never been thus grouped together, and my purpose is two-fold. While they indicate the Roman origin of two of the buildings to be passed in review, they afford us evidence not a little startling of the extent of Christianity in Canterbury in Roman times. Here, in a distance hardly one mile from one site to another, we find reliable record of no less than three separate and distinct Roman churches, two being by historical evidence; the third, at St. Pancras, by that of the building itself.

* The date is given in the Saxon Chronicle as 430.

* Pre-Augustinian Christianity in Britain.—Journal of the British Archæological Association, 1867, p. 223.

* Bede's Ecclesiastical History, ed. Bohn, p. 60.

† This has been pointed out in the preface to the edition published by the Early English Text Society. The quotation is from this preface.

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I need dwell but briefly on Canon Routledge's discoveries at St. Pancras.* The building has a nave, 42 ft. 6 in. long; a south transept, central with the nave, 10 ft. 6 in. by 9 ft. 6 in. Another building, of exactly the same size, at the west end, contains the entrance, an eastern apse opening into the nave, and flanked on one side, where we should look for the chancel arch, by the base and part of the shaft of a Roman pillar, evidently removed, however, from some other building. The discussion as to the age of the walling has been materially lessened from the fact that the mass of the western wall has been visible above ground for many years, and has always been considered of Roman date. Attention was directed to it by the late Mr. J. Brent, F.S.A., who has often spoken of it to me. It was pointed out to the members of the Royal Archæological Institute as a Roman wall by Mr. J. Parker, C.B., than whom no man in England is a better judge, from his acquaintance with brick buildings so common in Rome and so unusual in England. The concrete floor, too, of the church was pronounced to be similar to what is found in Roman villas by Mr. Roach Smith, F.S.A., long before the church-like plan of the building had been developed. The walls of the church are of brick and flint, and have been altered, probably in Saxon times, the large chancel-arch having been lessened in width, and another opening made into the transept. It may be noticed, too, that the western building of brick has a straight joint where it abuts on the western wall of the church, as if the former were later in erection than the latter. Still, minute inspection will show that the walls of this western building,—tower or porch,—has been not only plastered, but painted in bright purple-red Roman fresco. A part of it is still visible in the old west wall beside the threshold of the Norman western door leading into the church, where it was met with during the recent excavations, having been buried beneath the level of a later floor.

To pass to St. Martin's. Probably few buildings have been more frequently scanned; probably few in a more superficial manner. The result is, that its true evidences have been passed by unrecognised, the popular belief being that the walls are Early Norman, with a later east end; the flat pilaster buttress of the nave being considered as conclusive in determining the date. No statement is further from the fact, for there is nothing whatever of Norman work in the walling except very apparent insertions. We may search in vain for the inner and outer casings filled in with rubble, so common in Norman work. There are no small worked quoins, with Norman diagonal tooling; no grouted work, and no thick walls such as the Normans always built. On the contrary, the walls at once testify that they are different from those of an ordinary church by their unusual thinness,—a characteristic rather of some modern than of ancient churches. They average 1 ft. 10 in. only in thickness. This dimension must at once attract our attention, for it is very usual in the walls of Roman villas, where we meet with it over and over again. The materials, too, are similar, resembling what we find in villas,—a mass of solid rough walling, partly of brick, partly of stone, evidently intended to be plastered originally on both sides, and in the case of the nave of the church, built with sea-shore mortar of such remarkable solidity that, although the walls are thin and lofty, yet they have sustained the thrust of the later high-pitched roof of Gothic times without injury, and they still stand solid and sound. The flat buttresses at the south-east angle, and the central circular buttress of the nave, are of stone up to a certain height, then of brick; above this they have been tampered with. Those of the south-west have disappeared during some rebuilding of early date. One only of the north-west angle buttresses remains, the other has been cut away. It is constructed for the most part of stone from some other Roman building, and roughly cut to fit into its present position. The neatness of the evenly-cut beds of earlier date contrasts with the roughness of the later work. It was within the church that the Rev. Canon Routledge's first discovery was made. His curiosity being excited, he had a portion removed of the modern wall framing near the south-east angle of the nave. Here, hidden behind it, a portion of the original plastering of the walls was met with in position. It is Roman plastering formed of pounded brick. By Canon Routledge's invitation, I had an opportunity of inspecting this remarkable evidence of the Roman date of the building. I placed a specimen that I removed from the walls with another which I had brought but a short time previously from the Roman villa at Wingham. They are identical in texture, and but that I had marked the latter, which is thinner, I should not have been able to distinguish between them. This plastering has been found internally on several portions of the nave walls, both north and south, but not quite up to the west end. During a recent visit I found that the south walls of the nave had also been plastered, externally, with mortar of pounded Roman brick, in larger fragments than to the interior, and a portion of it is still firm. Its course may be traced, and this indicates the portions of walling that are original, and those which have been rebuilt. It can be traced to the lower part of the central buttress, but not to the upper, and it disappears when near the west end. The western part of the chancel wall, south side, is wholly of brick; the sea-shore mortar is not so apparent, and the Roman plastering has not been met with either internally or externally. It may, therefore, prove that this portion, like the brickwork of St. Pancras, is of slightly later date, and that we have in St. Martin's an example of a church to which a chancel has been added. Whether or not this chancel ended originally in an apse has yet to be proved, the present square east ending being of the thirteenth century, and an extension of the original building. On the south side two curious openings call for remark. One is a square opening, having a massive lintel of green stone above, and an equally solid threshold below. This had been walled up in Mediæval times, in part, and used apparently as a low side window. Traces of wall painting were found on the later enlarged jamb on the west side. To the east of this a small semicircular arch is to be seen, recently revealed by Canon Routledge. This may be of later date than the former opening, for, while the eastern jamb appears solid, and the bricks which compose it range with the others, that on the west side is not so regular, and the arch itself, of thin stones, seems as if it had been inserted in an older wall.

St. Martin's Church consists of a nave, chancel, a western tower of fourteenth-century date, and a vestry and organ-chamber of more or less modern work on the north side of the chancel. In seeing much modern work within the building, we cannot but regret that the golden opportunity afforded by the ordeal of restoration some years ago was not taken advantage of for a thorough survey of the fabric. The Roman work is of late rather than of early date.

To conclude. We have at St. Martin's the concurrent testimony of history and of the building that it is of Roman date. We have, also, the close analogy of the work with that of St. Pancras, even to the differences of construction there visible. In both buildings alike the orientation, which is perfect, points to the fact that these two Roman buildings were originally intended to be churches, and that we are not regarding the remains of buildings originally erected for some other destination, used at a later period for sacred worship.

The gratifying nature of this evidence will commend itself to many a lover of our old English churches. Probably to no one parish church has more interest been shown than to the little Church of St. Martin, on the hill side overlooking Canterbury, where at least the site and the surroundings have been recognised justly as the same as when Queen Bertha worshipped here, and St. Augustine commenced his momentous mission. This interest may now be very greatly increased when weighty archæological reasons are thus rendered to justify our belief that the fabric is actually the same as in their day, and that we have in it, as at St. Pancras, actual remains of a Roman Christian church.

The revealing of traces of two Roman churches where none have been hitherto noticed is a remarkable archæological fact. It is sufficiently gratifying to show that, while we are spending pleasant holiday hours, we are recovering a portion of the lost history of our land. No sooner is the subject noted than its scope enlarges. St. Pancras shows in its eastern apse that this feature was of earlier date than at first we may have been inclined to believe, and that its presence here need not be attributed to any importation either from the Western or the Eastern Church. I have already spoken of the semicircular apse of the Roman villa at Frampton, a feature of constant occurrence in such buildings; but we owe to Mr. G. Dowker, F.G.S., evidence of its existence on an extended scale. He opened out the site of the church within the Roman station at Reculvers in 1877, and proved beyond doubt that the building in all its leading lines was Roman. It has an eastern apse, a nave, and side aisles. The walls of all are of this early date, and the flooring is so also. In the present condition of our knowledge we must believe that this is a Roman building. A basilica it may be, for we can hardly believe that in the third or fourth centuries the centre of a new Roman station could be chosen for the site of a Christian church. So church-like, however, is the plan, that it affords us good evidence that the church-builders did at once follow it as a model in Britain, as we know they did on the Continent, and we may, therefore, believe that the builders of the apse of St. Pancras had their model at hand. The plan, too, of the ancient church of Brixworth, Northants, with its nave arches neatly turned with Roman bricks, and its so-called three periods of Saxon work, is so like in its leading lines to the plan of Reculvers as to raise the inquiry in our minds whether or not we may not find there also traces of another Roman Christian church.

* The record of the excavations at St. Pancras is given in a paper by the Rev. Canon C. F. Routledge, in "Archæologia Cantiana," vol. for 1882.

AN IRON LIBRARY.

For the last twenty-five years there has been a small literary army at work, under the auspices of the Philological Society, to compile a dictionary of the English language so comprehensive that not only every word now in use, but every word that has ever been in use, should be duly registered in it. To use Archbishop Trench's figure, the intention is to draw a sweep-net over the whole surface of English literature. Herbert Coleridge was the first editor of this coming dictionary, and under him plied about 150 volunteers of the first literary water. After his lamented death, Mr. Furnival took the helm, and was assisted by a volunteer staff as brilliant and enthusiastic. And now Dr. Murray, of Mill-hill, guides the gigantic undertaking. No fewer than 754 volunteers are now engaged in reading and transcribing, and in other ways furthering it, under his directions. When the scheme was handed over to him two tons weight of material had accumulated, and the question arose where was this amount of literary stock to be housed. In this month's number of *Frazer's Magazine* there is a minute, learned, and picturesque account of the whole endeavour, under the title, "English: its Ancestors, its Progeny," by Miss Humphreys, which tells us Dr. Murray met the difficulty by the erection of an iron library:—

"He orders an iron library, therefore; he puts it, too, precisely at his house-porch. His house,—a quaint timber-layered, white-painted old residence at Mill Hill . . . . is just added to, in this magical way, by an extra apartment, and all is complete. The bit of land thus covered was a sunny piece of garden before. It was a part of the village. The small-paned windows of one side of the house looked at it, and looked at a gate that led at once into primitive shop-keeping and close gossip, into all the hot sleepiness and settlement of comfortable and contented rusticity. But now the small-paned windows are blocked up, or nearly so, by the corrugated sides of the new structure; by its sky-lighted roof, sloping and spreading; and there is no view of opposite gable and branch-top, of loitering neighbours, of the rare interlude of a vehicle passing by. The scriptorium, become the object of the life to be passed in that tranquil suburban home, is become also the main object, in the other sense, to be looked at from the home; and there it is, in its so many feet of flat dull grey, its so many feet of flat dull brown, whilst yet the uncomely stiffness of it, the uncomely straightness of it, is just redeemed from all of prosaic utilitarianism by the fringe of ferns, self-sown and graceful, that decorate its feet, by the occasional chirrup and song of free and happy birds."

In this library, or scriptorium, as it is called, which is lined with rows and rows of plain deal pigeon-holes and shelves, and furnished with plain deal tables, sit a few especial workers. The main body of volunteers do their work in their own homes, where each reader is furnished with a packet of slips printed with the title of the book that is to be perused, the date, and initials for volume, chapter, and page. About 1,000 of these slips are returned daily, filled up

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with more or less neatness and accuracy. We quote the following passage with pleasure:—

"These are slips, contributed by an architect, to represent architecture, as beautifully copied,—in red ink the title, in black ink the extracts, that the contrasts may relieve the eye,—as if each were the under-writing of an exhibited design, with no item too insignificant to get reverent place upon the plan. One John Shute's book, these quotations are seen to come from, as they enforce attention:—John Shute, Paynter and Archyteck; getting imprinted at London in Fletestrete, nere to Saint Dunstan's Churche, by Thomas Marshe, 1563; calling his work 'The first and chief groondes of architecture used in all the ancient and famous monymentes; with a farther and more ample discourse uppon the same than hitherto hath been set out by any other." It is an illustration, than which nothing better could come, of the way all artists in their own art, all scientists in their own science, are rallying round the Scriptorium and its master, pouring in his stores their own special knowledge of their own special by-ways, that what each can furnish shall have no failure, but shall help, at its best, to bring the grand outcome of modern philology to good completion. So good an illustration, in fact, is this individual contribution that, lingering over the careful pile of it, turning to extract after extract (they count up nearly to a thousand), it is felt to be a pity they should lose their painstaking presentability,—getting worked in and woven in and out, among the 1,100 pigeon-holes, being picked out by process and process, treated by every article of the code,—a score only, possibly, in each intricacy of letter A, a score or two in B, a score more in other divisions of other letters, and so on through,—and, some way, this pity gets itself to some expression, 'Yes,' are Dr. Murray's words, there being quickness with him to follow the thought of it, 'these quotations are to be valued immensely. They are lovely.'"

THE LIVERPOOL WATER WORKS.

The giants and elfs who, in bygone days, were supposed to haunt the peaks and cyms of the Welsh mountains, had the credit of many deeds, good, bad, and very indifferent, which, however, often showed a decided taste for engineering. The erection of strange old bridges, placing huge boulders on out-of-the-way places, and mischievous tricks with water, were ascribed to mysterious powers or to the Father of Evil himself, and explanations,—satisfactory enough for an age of timid inquiry,—were thus given, that checked any research into plain and half-forgotten facts.

But, as the dreams and fables of such times were often the weird dressing of what was, or had been, a reality; so the achievements of modern times have often been truths stranger than the fictions they have more than rivalled, and in the country where the antiquity of our island has so long preserved its romance and its traditions, some of the most noted feats of mechanical greatness have been performed. The Ruabon aqueduct, the Menai bridges, and the Holyhead road and rail have each their fame.

In one of the most secluded valleys of Central Wales, where road, in the usual meaning of the term, has never been, and where rail ought, perhaps, never to go, a great work is proceeding: a valley is to be flooded and a lake formed that shall rival the Llyn Tegis of Bala in size and beauty. The invisible elfs mentioned above would, no doubt, have done such a job in a night, and the first result attributed thereto would have been the discomfiture of some luckless swain who had transgressed the unwritten laws of superstition; but in sober reality many days and nights, for some years, will have to be spent in very prosaic labour before the pure waters of the Berwyns and the Cynynion can flow to be a blessing to the people of Liverpool.

For some years the question of water supply had been urgent with the authorities of that town, and had been discussed with all the various opinions and crotchets of people and parties; the advice of the thoughtful, and the clamour of the thoughtless; the opinion of the expert, and the theories of the incompetent. With some, the Mersey (like the camel to the Arab) was equal to any need. To others, a "deep well" gave hope of abundant supply, but at length the present scheme was approved and decided upon.

The western end of the Berwyn mountains, which form the great water-shed of Central Wales, separates Montgomeryshire, on its northern extremity, from Merionethshire. Shrouded in mist, and watered by almost continuous rains, the solitary peaks seem nearer akin to the clouds than to the dry land. The Dee and its tributaries are fed from the northern slopes, and the numerous streams that run down the southern slopes find their way to the Severn. About half way along the mountain road from Bala station to the village of Llanwyddin (some twelve miles south), several of these streams originate and ripple down the cyms and hollows, joining below to form the river Fyrnwy, sometimes spelt Vyrnwy, and pronounced Vern-yew. The valley through which the infant river meanders is formed by the great spurs or outliers of the Berwyns. On the east, Cyrnia Nod (2,188 ft.), and other mountains of lesser height, form a vast barrier, whilst on the west Carreg-y-big (1,937 ft.) and its outliers hem in the valley, which, at its upper end is divided by a prominent mountain, Allt-yr-Eryr. From this point the valley opens out and has a level alluvial bottom covered with pasture, and in wet seasons entirely overflowed by the river. About two miles along, the small village of Llanwyddin is situated on the slope of the eastern mountains; and again, another two miles, and by the old farmstead of Cynon-isaf, the hills turn and approach each other, thereby partially closing in the valley at its southern end, and leaving a comparatively narrow opening, through which the river emerges, and where the dam will be placed.

From this point, looking northward, the view is very beautiful; the valley beneath, with the rising mountains on either side, and the prominent Allt-yr-Eryr in front; the village about half-way among the trees on the right, but otherwise scarcely a touch of art to vary the native solitude of the vale, which, reluctant as one feels to see it altered, will have a fresh charm when it becomes Lake Vyrnwy, or the great reservoir of the Liverpool Corporation Waterworks.

But the picture of solitude and seclusion is soon changed, if one looks to the immediate surroundings of Cynon-isaf. Engine-houses, tramways, navvies' huts, and spoil banks, form a strange contrast to this lonely part of "Wild Wales." The course of the river has been diverted to the west side of the narrow end of the valley, and a trench dug across to receive the foundations of the great embankment which is to reach from side to side. The bottom of the trench, upwards of 50 ft. below the surface, exposes compact strata of rock of the Silurian series, known to geologists as the Bala or Caradoc beds, which has been carefully cleared of loose fragments and soft matter, so as to afford a clean surface for the concrete. The embankment, 1,255 ft. in length, will consist of two broad walls of masonry, with the intervening space filled up with cement concrete. The ends of the wall will be built into the slopes on either side, where huge "chases" are being cut to receive them. At the eastern end, in the face of the rock, immediately above what will be the top of the embankment, a granite tablet is inserted, with an inscription recording the date when laid by the Earl of Powis and the names of the principal members and officials of the Liverpool Corporation who were associated with the scheme.

The Earl of Powis is the principal landowner of the district, and of course his lordship's rights, with those of his tenants and other owners, have had to be purchased by the Corporation. The various preliminary surveys, levelling, gauging the volume of the river, &c., prepared the way and gave the inhabitants warning of the great engineering invasion, and, naturally, regrets at the disturbance were modified by the prospect of making something out of it.

A story is told,—which we think has been told before,—of an old Welshwoman who had a small mountain farm not far off, and had usually sold her hay to a dealer at Llanfyllin. Two years ago, as the works were about to be commenced, the dealer drove over to make usual arrangements, but found the good woman unwilling to sell. Desiring to know the reason, she informed him in their own language that she anticipated a ready sale nearer home, as a number of "navvies" were coming to the place.

The outlet for the water is in the eastern corner, where the Hirnant tunnel (two and a quarter miles long) is being driven in the direction of Oswestry. From the tunnel the water will be conveyed for some thirteen miles over rough and uneven country, intersected by numerous valleys, then through two short tunnels connected by syphon-pipes to the Oswestry reservoir and filter-beds. From this spot the pipes will be carried to Malpas, then northwards, and under the Mersey to Prescot reservoir, near Liverpool. The total length of the aqueduct will be 67¼ miles.

The height of the embankment will be nearly 100 ft. above the old river-bed, and, after allowing for parapet-walls and roadway, the water-level itself will be more than 80 ft. above the old river. At this level the lake will have an area of upwards of 1,000 acres, at a height of 800 ft. above the sea, and extend 4¾ miles northward, covering the village of Llanwyddin, the roads on either side of the valley, a few detached buildings, and Eunant Hall, a respectable mansion at the foot of Allt-yr-Eryr, where the members of the water committee find rest and refreshment after their periodical journeys from Liverpool to inspect the progress of the works.

It will thus be seen that, apart from the actual operations necessary for the water-supply, much has to be done, even in such a sparsely-populated district, to reinstate that which must be destroyed. The old village of Llanwyddin will soon be a thing of the past,—its church, school, chapel, "hotel," and cottages, are to be pulled down, its dead will be disinterred, and new Llanwyddin be built nearly two miles on the mountain side, beyond the reach of the pent-up waters. Eunant Hall, too, and lesser erections, are doomed, and already the new roads are in course of formation.

Near the site of the embankment are the engine-houses, workshops, &c. The engines work the pumps, by which the trench is kept clear of water; also the Siemens generators for supplying the arc-lights, by which the excavation has been continued at night. Saw-benches, lathes, &c., are also in operation. A large shed has been erected for storing the immense consignments of cement that will be required for the walls. A wise provision for the workmen has also been made in the construction of a large "cocoa-room," and near by is a school-church and a mission-hall.

In the Cynynion valley, about a mile away, a quarry has been opened, and stone, easily accessible and of excellent quality, is being procured for the embankment walls. A railroad is laid from the quarry, from which the stone will be conveyed by small locomotives.

All other materials have to be carted from Llanfyllin (pronounced Clan-vut-lin), a terminal station on the Cambrian Railway, about ten miles distant. Costly as the haulage must be, there are good reasons for not making reservoirs places of easy resort or increasing population.

The Earl of Powis will have the privilege of keeping a steam launch on the lake, and another will also be placed there by the corporation. In case the present catchwater area should need supplementing, an increased supply can be obtained by tunnelling through into an adjacent valley.

Most of the work is being carried on by the corporation, under the supervision of their water-engineer, Mr. G. F. Deacon, but the Hirnant tunnel is entrusted to a contractor, and the aqueduct generally will be let by contract in various lengths.

The navvies' huts are on the rising ground at Cynon-isaf, those for the quarrymen being in the Cynynion valley, and other wooden erections, together with some old farm buildings, are occupied by fitters, clerks, foremen, and managers.

As usual, the sudden influx of several hundred men has brought its attendant evils. Crowded together in temporary huts or roughly partitioned-off rooms, the accommodation being insufficient for the number employed, of necessity the requirements of social and sanitary well-being are neglected. The married men and their families make shift in the smallest rooms, almost compelled to take in as many lodgers as can crowd into the rest of the hut. The day and night shifts succeed each other in the same beds, and, as one brawny navvy remarked, with a tone of discontent, "Yer bed's always warm, and Saturday nights, when both shifts are in, there's three on yer in a bed. A feller's got no comfort." Happily there is no grog-shop on the works, to be a constant temptation to the wasteful and easy-going navvies, although the village of Llanwyddin on Saturday night presents a painful scene of inebriation.

When one looks upon the swarm of children and the armies of men at these and many other works, and remembers that such, at one place or another, is their usual existence, it seems imperative that something should be done to

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insure provision for more suitable accommodation, such as would be conducive to health, morals, and ordinary comfort; also that the children should be under the ordinary educational laws.

Some four or five years must elapse ere this great undertaking can be so far completed as to begin to be of service, and doubtless the actual finishing will require as many more years. Another generation, and the traveller who gazes upon Lake Vyrnwy will admire a scene that he will scarcely be able to realise is so largely the work of science and the doing of men.

THE NEW COURTS OF JUSTICE AT HAMBURG.

This structure has recently been completed in its internal arrangements, and will form an imposing feature amongst the many improvements which have lately taken place at Hamburg. The building has a south-west aspect, and looks upon a newly-laid out open space. Its length is 375 ft., and its greatest depth in the centre is 143 ft. 6 in. The underground portions are vaulted, and above the ground-floor are two main stories. The ground-floor is devoted to the civil tribunal; the first-floor to the criminal courts; and the second to the public prosecutor's offices, rooms for examinations, &c. A wide flight of steps leads up to the main entrance. This leads to a vestibule, through which a corridor passes which runs from end to end of the building, and thus facilitates communication between its respective portions. The prisoners are brought from the adjoining prison to the underground floor of the building, from which a special staircase leads to the criminal tribunal.

The fitting-up of the interior is simply, but solidly executed, all the doors and window-frames being in oak. The court-rooms are provided with high wainscoting, and with appropriate ornamentation in wood. The windows are of coloured glass. The heating of the entire building is effected by central air heating. There are also arrangements for ventilation, by means of which fresh air is supplied to the rooms as may be required. The gas and water arrangements, as well as the closets, are upon the most approved principles. The façades of the building are executed in yellowish-red brick, together with sandstone, the whole effect being in harmony with the character and objects of the structure. The roof is covered with slates, and the cast-iron lattice-work is effective. The lightning-conductors are upon an approved system.

The building is from the designs of Herr Zimmermann, who has personally supervised, in a general way, the progress of the work. The structure was commenced in May, 1879, so that the time occupied has been nearly three years and a half. The entire cost of the building is 75,000*l.*, and the furniture has cost 4,000*l.*

THE NEW BUILDINGS IN NORTHUMBERLAND AVENUE.

The vacant land in Northumberland-avenue is gradually being covered with new buildings, several spacious structures, most of them of a public character, being now in progress. At the south-west corner of the Avenue, extending into Whitehall, and immediately opposite to the Grand Hotel, a large and handsome block, faced with Portland stone and polished Aberdeen granite, has already been carried to a height of four stories. The ground-floor portion of the building contains nine shops, and the upper floors are intended for offices and chambers. Messrs. Francis are the architects of the building, and Messrs. Dove Bros. the contractors.

At the lower end of the Avenue a residential block, upwards of 80 ft. in height, and containing three stories besides the ground-floor, is rapidly approaching completion. The elevation is entirely in Portland stone, richly ornamented and carved. The ground-floor has a massive arched window, occupying the whole of this portion of the frontage, with the exception of pediment entrances at each side. The first and second floors have handsome central three-light oriel windows, and to the third-story windows there are projecting stone balconies. The ground-floor is intended for offices, and the rest of the building will be occupied by Mr. King, the builder, as his private residence. Mr. Groom is the architect of the structure.

Adjoining the last-named building, and opposite to the premises of the Society for Promoting Christian Knowledge, a large area has been secured for the erection of what have been designated the Charing Cross Turkish Baths. They will have a frontage of about 70 ft. to the Avenue, with a similar depth extending northwards to Craven-street. The foundations of the building are at present being got in, and the superstructure will shortly be proceeded with. Mr. Robert Walker, of Warwick-court, St. Martin's-lane, is the architect, and Mr. Woodward, of Finsbury, is the contractor. The baths are being erected for Mr. Neville, who is the proprietor.

The Metropolitan Board of Works are likewise erecting a new fire-brigade station close to the buildings of the Society for Promoting Christian Knowledge. The principal frontage of the station will be at the upper end of Great Scotland-yard, a short distance west of the Avenue. Mr. Vulliamy has designed the buildings, and Mr. Reading, of Buckingham Palace-road, Pimlico, is the contractor.

On that portion of the land at the bottom of the Avenue, near the Thames Embankment, and bounded on the south-east side by Whitehall-place, the "Hôtel Métropole," is about to be erected. It is stated that it will not only be the largest hotel in the metropolis, but in the world. It will have a frontage to the Avenue 320 ft. in length, with a frontage of a similar length to Whitehall-place, and will occupy a ground area of about an acre in extent. The necessary excavations, preparatory to constructing the foundations of the building are now in progress.

Messrs. Perry & Co., of Tredegar Works, Bow, have entered into a contract for the erection of the "Northumberland Avenue Hotel," of which Messrs. Isaacs & Florence, of Verulam-buildings, Gray's Inn, are the architects.

It is said that the recently-erected Avenue Theatre, which, it is understood, will be taken down for the extension of the Charing-cross Station, under the South-Eastern Railway Company's Act of last session, will in all probability be rebuilt on a site adjoining the Grand Hotel.

THE NEW THEATRE OF ARTS, ROUEN.

The quaint old town of Rouen, which though so thoroughly French, is so intimately connected with English history, was, a few days since, dressed out in gala gaiety. The new Théâtre des Arts, which has replaced the theatre burnt down, it will be remembered, some time ago, was opened with no small degree of ceremony by the French Minister of the Interior; and the architect, M. Sauvageot, received, in the *foyer* of his new house, the Cross of the Legion of Honour. This is one of the graceful tributes which are rendered by our neighbours to the artists who have given France her honoured place in the world. It is these rewards for zeal, these incitements to labour, and this acknowledgment of merit which, it will be found, we suspect, give the French artist,—be he architect, painter, sculptor, or musician,—that due sense of his position, social and professional, which can scarcely be said to exist in our country. It is no democratic custom, for we see empires and monarchies alike generous in the distribution of the honours at their disposal amongst those who maintain the artistic dignity of the country to which they belong, and who create those works which will give it a reputation with posterity.

The old Theatre of Arts at Rouen was built in 1776, and was destroyed by the great fire which devastated part of Rouen in 1876. A competition was invited, and many designs were submitted. M. Sauvageot, as City Architect, was not eligible to compete, but he nevertheless prepared a design, which has been carried out, and was opened on Saturday, September 30th, evidently without any of those imputations which in England generally follow, not without apparent reason, such an incident. Pains have been taken to provide a sufficiency of separated staircases and exits, and the stage is cut off from the auditorium by a curtain of plate iron, which is moved with great facility by an hydraulic arrangement.

The new theatre is built on the site of the old one (the area having been enlarged), and is completely isolated. We give a view of the exterior. It covers an area of 1,800 superficial mètres. The stage is a very fine one, and the rooms for the artists are remarkably commodious. The auditorium is elegantly decorated and contains 1,600 places. The separation of the tiers of boxes has been well studied, and a good view of the stage is afforded the spectators generally. The *foyer*, of which we publish a view, is a handsome and well-proportioned apartment, and there is a vestibule beyond. The *foyer* is adorned with pictures from the pencil of M. Baudouin, including Melody, the Lyrical Drama, Heroic Music, and similar subjects. The ceiling of the theatre shows a well-coloured allegorical picture by Glaize.

The theatre was opened with an excellent performance of the "Huguenots," seats being at a high premium.

LUTON COFFEE TAVERN.

This has been erected by the Bedfordshire Coffee Tavern Company, and occupies a site with a double frontage, viz., Cheapside and Barber's-lane, as shown by the plan.

There are two separate bars, divided by a manager's room and dining-room, which has also two entrances. The kitchen is in the basement, with lift to dining-room.

On the first floor is a large billiard-room for two tables, ladies' room, and commercial-room; and on the second floor seven bedrooms for letting. The whole of the building is fitted up in a pleasing and superior style. It was formally opened on October 2nd, by Earl Cowper, K.G., who was accompanied by the Marquis of Tavistock, Mr. Frederick Howard, and other gentlemen. The architect is Mr. Charles Bell, F.R.I.B.A., of Dashwood House, 9, New Broad-street; and the builders are Messrs. Smart Bros., of Luton. The contract was 1,790*l.*, and the whole outlay, including land, will be about 2,800*l.*

THE ZOOLOGICAL MUSEUM AT THE "JARDIN DES PLANTES," PARIS.

This striking building is erected at the end of the grand pathway of the garden at the side of the glass houses. In the centre of the façade is placed a large statue in white marble, within a niche of marble of the same colour.

Upon the upper frieze are engraved the names of those *savants* who have contributed by their works to the progress of zoological science,—Vauquelin, Blainville, Tournefort, Bernardin de Saint Pierre, Claude Bernard, and others.

SELWYN COLLEGE, CAMBRIDGE.

The formal opening of Selwyn College has taken place. The college has been founded to commemorate the name and character of the late Bishop Selwyn "as a loyal and distinguished son of the Church of England, as an example of manliness and simplicity of living, and as a great missionary bishop." A sum of about 33,000*l.* has already been contributed for this purpose, and the first block of the college has been erected on a plot of six acres of land at the back of King's and Queen's Colleges. This will accommodate sixty students. The thirty who will come into residence immediately will occupy the end next West-road; the master has apartments on the other side for the present. His lodge will be the next structure taken in hand, and then another block of rooms for sixty more students, as funds come in. When completed, the college will form a quadrangle, with its principal front next Grange-road. The present building, which is in the Tudor style, has been erected by Messrs. Horsman & Co., of Wolverhampton, the architect being Mr. A. W. Blomfield, M.A. The carvings have been executed by Mr. Jas. Frampton.

The Proposed Fish-market at Shadwell. The Act to establish a second London Riverside Fish-market at St. Paul's, Shadwell, has been issued. The former statutes to establish the London Central Fish-market, Farringdon-street, and one near the Elephant and Castle, Newington-causeway, have been noticed. The present and third Act provides for the market and the formation of a new street, and the improvement of existing streets, with "landing-stairs," near the market, which, it is declared, will be of local and public utility. Compulsory power to take property is limited to three years, with provisions as to the displacement of the labouring classes and their accommodation.

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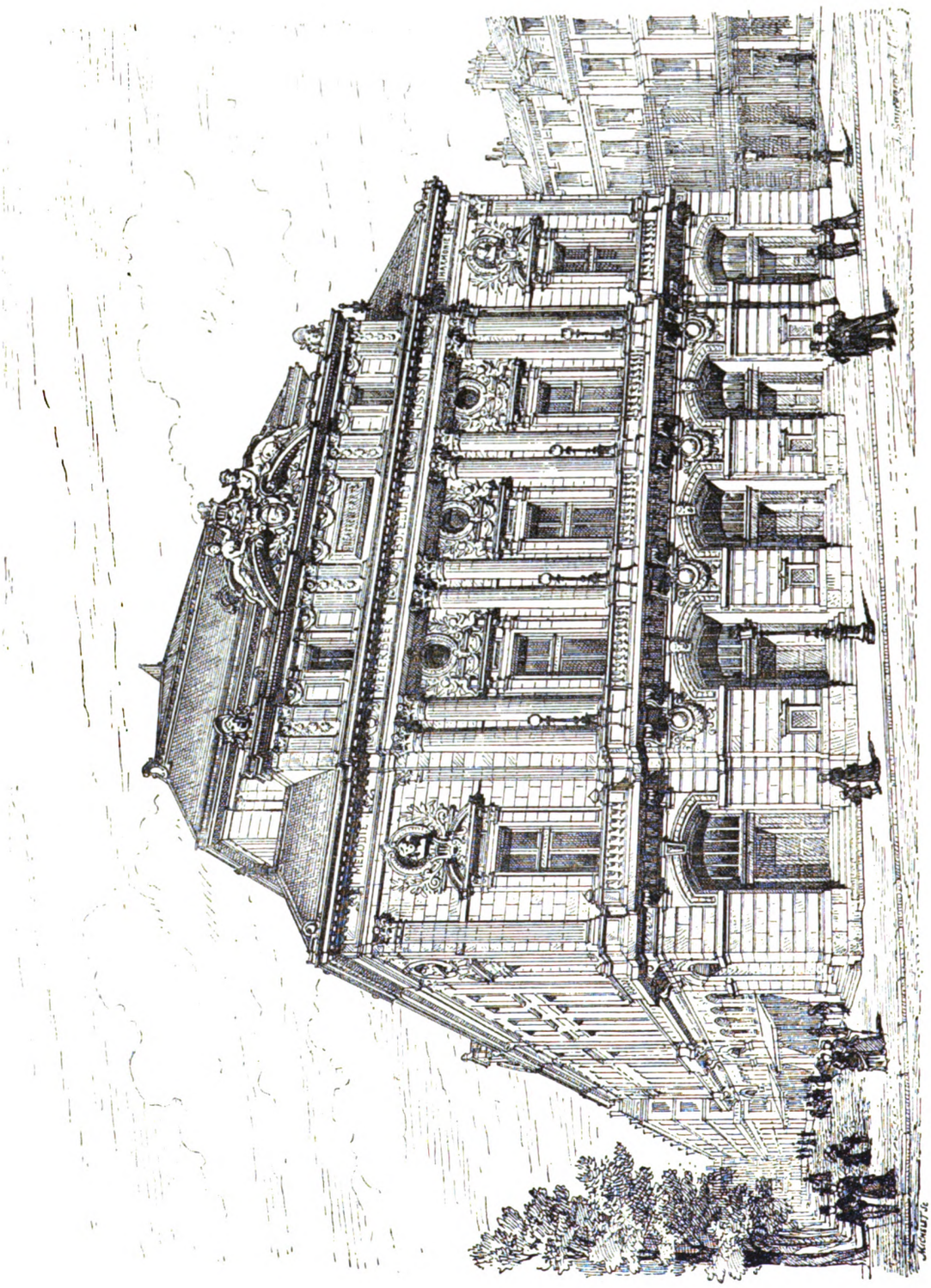

THE NEW THEATRE OF ARTS, ROUEN.—M. L. Sauvageot, Architect.

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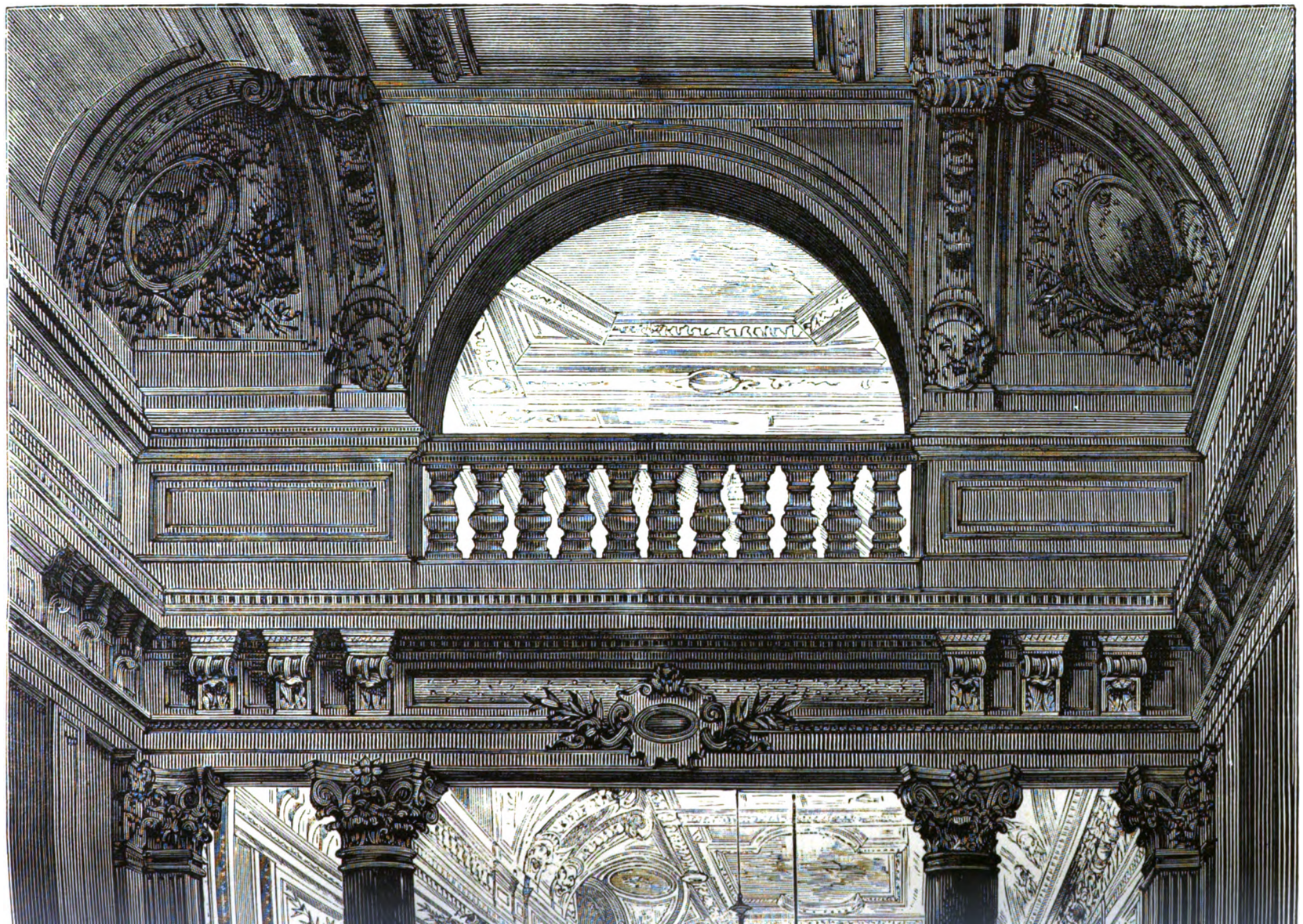

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THE NEW THEATRE OF ARTS, ROUEN: THE FOYER.

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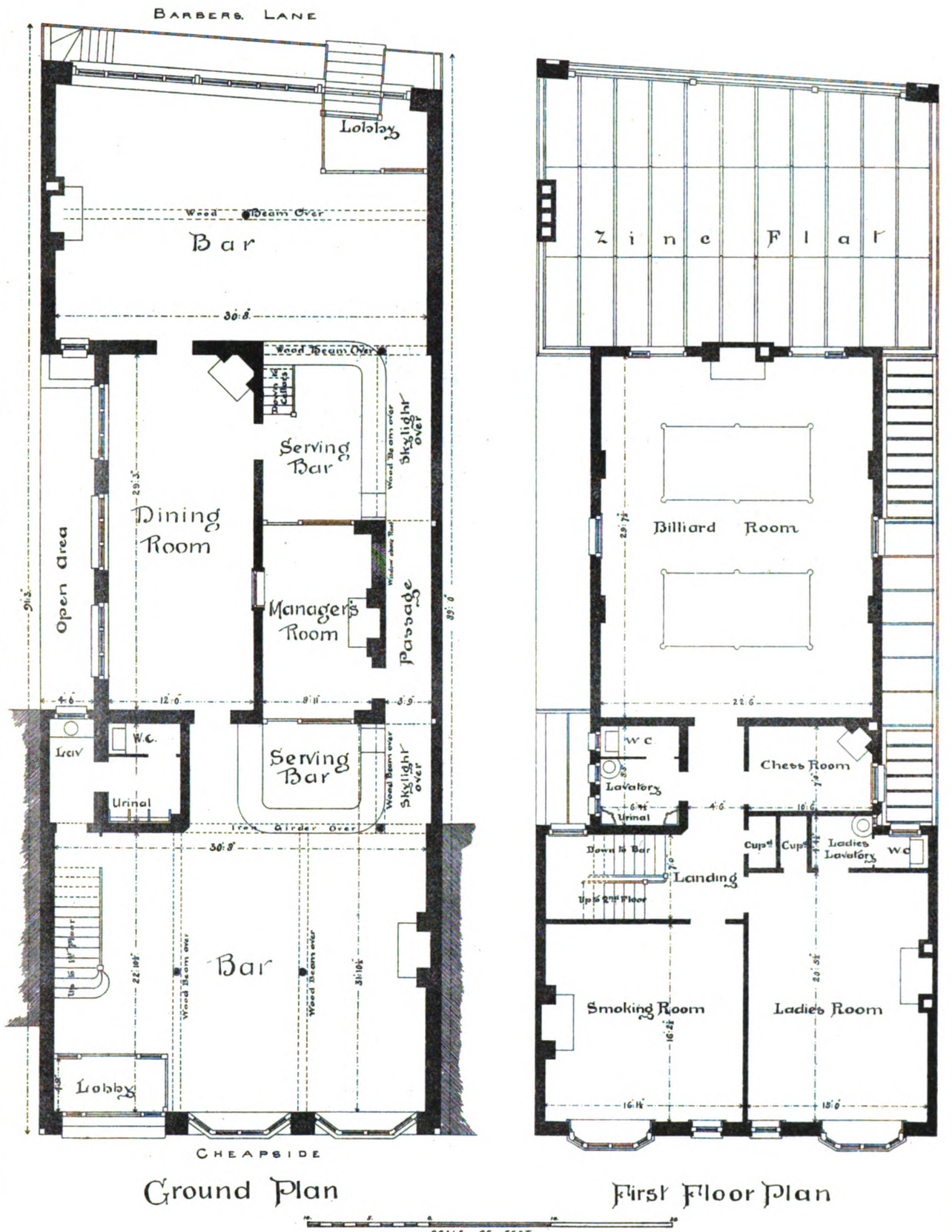

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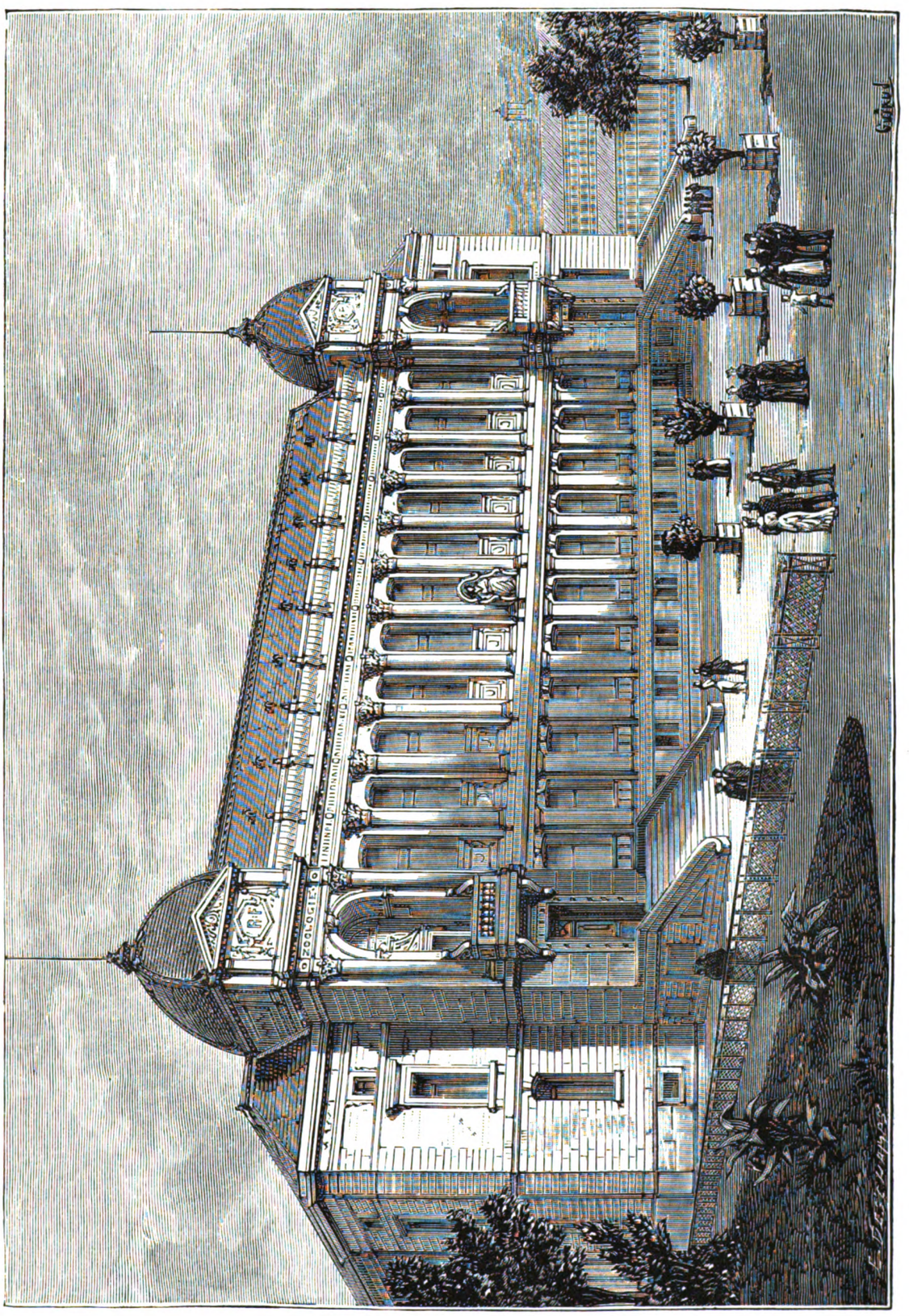

THE NEW ZOOLOGICAL MUSEUM AT THE GARDEN OF PLANTS, PARIS.

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SANDRIDGE AND WHEATHAMPSTEAD, HERTS.

The general meeting of the St. Alban's Architectural and Archæological Society was held on Coleman's Green,—an open space by the side of the road which leads from Sandridge to the valley of the Lea, and thence to Welwyn. A goodly number of the members and their friends had assembled, having in prospect some visits to pleasant places thereabouts. The formal business was gone through on the green knolls, and thereafter the Rev. Dr. Griffith, the vicar of Sandridge, called attention to the only remaining portion of an old cottage, the property of Earl Cowper,—an ivy-covered chimney, propped by a brick buttress, bearing this inscription:—"John Bunyan is said by tradition to have preached and occasionally to have lodged in the cottage of which this chimney was a part." The Vanity Fair of Bunyan, and other allusions in his works, Dr. Griffith thought, brought St. Alban's to mind,—the author must have had that town in memory. The tradition with reference to Bunyan's visits to Coleman's Green comes through persons now living, who have talked with Robert Coleman, who seems to have lived in the old cottage, was buried at Wheathampstead in 1844, aged 93, and consequently was born in 1751. Bunyan died in 1688.

The ancient moat and slad were next visited, slad being a deep cutting between trees (A.S., *slâd*). This deep cutting, part still filled with water, is easily followed for a considerable distance. When connected with the parallel dyke in the west of it, a space of about 180 acres was enclosed. Dr. Griffith considered this a camp of refuge, at least as old as the Saxon times, for the old parishes of Sandridge and Wheathampstead, which existed as such in Saxon times, were divided by the dyke. Long before that it may have been in existence, and used by the Britons in the tribal wars which were so frequent. It was also probably used at the time of the Danish invasions. It shows marks of Saxon occupation; the fields in the vicinity have Saxon names. Lower Beech Hyde was passed on the way to the parallel dyke, called the Devil's Dyke locally and in the Ordnance Survey, &c. Dr. Griffith explained that the word "Beech," in Upper and Lower Beech Hyde Farms, had a very different meaning from the name of "The Beech Farm" in the adjoining parish. They were probably named from the slad, for the word "Beech" was formerly used not only for the sea-shore, but for any bank. The Devil's Dyke is an artificial valley of considerable depth, width, and length, the earth taken from the cutting being placed at the sides and increasing the depth. It was nearly north and south, and divides the parishes of Sandridge and Wheathampstead, the Hundreds of Cassio and Dacorum, and the two divisions of the county of Hertford.

The next point visited was Marford Bridge, near which once stood a wooden cross with an alabaster image of St. Mary. Standing on the wooden footbridge,—across the River Lea, about half a mile to the east of Wheathampstead,—Mr. R. R. Lloyd, the honorary secretary of the society, said:—"The earliest mention of Marford in the Chronicles of St. Alban's Abbey, occurs during the Abbacy of Robert de Gorham (1151-66), when some land is described as lying 'between the stream of Marford and the land of Sandrugge' (*Gesta Abbatum*, i. 134). It is again referred to in the years 1424-5, in the following passage:—'In the third year of the reign of King Henry VI. (1424-5), William Marforde, a tenant of the Abbot of St. Alban's, in the parish of Sandrygg, having through old age been deprived of his eyesight, caused a wooden cross to be erected on this side of Marforde Brigg, near the highway, on the right-hand side going towards Codicotte; this cross, with an image of St. Mary in alabaster, stands on the land of the lordship of Sandrugg' (*J. de Amundesham Annales*, i. 6). The two fields nearest to the ford on the south-east are named respectively 'Marvel [probably a corruption of "Marford"] Meadow,' and 'Crosspath Fie'd.' Marford, which is a hamlet of Wheathampstead, possesses a name whose first syllable is a puzzle to antiquaries. Mr. J. E. Cussans, in his admirable 'History of Hertfordshire,' gives it as his opinion that it stands for *mere*, the whole word meaning the 'ford of the *mere*.' 'The whole valley,' he writes, 'was one vast lake or mere, hence the name of the manor Lamer, or Lee-mere. At certain places this mere was fordable, as at Batford, Pickford, and Mereford, now called Marford. At its narrowest part, between the comparatively high ground on which the railway station now stands on the north, and the church on the south, it was spanned by a bridge, over which passed, and still passes, the road from St. Alban's to the North' (Part xiv., p. 326). Others have thought that Marford is a corruption of Mary's Ford, and that it takes its name from the image of St. Mary which formerly stood hard by. This, however, seems unlikely, since the name Marford was in use, as I have shown, nearly 300 years anterior to the erection of the image of St. Mary, the account of which, nevertheless, does not absolutely negative the possibility of a statue having been set up here in honour of the saint at a much earlier period. A third solution, which is offered with some diffidence, is that *Mar* is a contracted form of the Anglo-Saxon *Mearc*, a boundary. Upon this theory, Marford would mean 'the ford at the boundary,' a term singularly appropriate, when we consider that the boundaries of the Hundreds of Cashio and Dacorum, as well as those of the parishes of Wheathampstead, Sandridge, and Ayott St. Lawrence, all meet at this spot. Marbury in Cheshire, and Marbrook in Shropshire, both of which stand on the frontier lines of the Anglo-Saxon kingdom of Mercia, are examples of the use of this word, which is found in its uncontracted form in Markyate-street." It may here be mentioned, by the way, that Mr. Cussans is seeking 500 subscribers for the fourth volume of his "History of Hertfordshire," the work to which he has already devoted thirteen years of incessant labour. The proposed volume will deal with St. Alban's, Roman and Mediæval; and contain many illustrations. The three volumes already published have entailed on Mr. Cussans a loss of about 3,000*l*.

The party then drove to Ayot St. Lawrence, and the Rev. Canon Davys, rector of Wheathampstead, gave a short history of the church, now a ruin, but clothed in foliage, and preserved with care and pride. The name of the place, he said, signified an "eyott," or island, as it were, of high ground, between the valleys of the Lea and Mimram. The two parishes of Ayot St. Lawrence and Ayot St. Peter seem to have been one at the time of the Conquest, though divided some time subsequently. Domesday Book speaks of one Geoffrey [de Magnaville] holding "Aicte" of the Abbot of Westminster, perhaps one of those manors which, like the neighbouring one of Wheathampstead, King Edward the Confessor granted to the Abbot of Westminster. This manor appears to have passed out of the hands of the Abbot and Convent of Westminster some time after the Domesday survey, as we find one William de Ayett holding it under the Abbots of St. Alban's in the reign of Edward I. This William de Ayett married Lettice, daughter of Sir Robert de Keynes of Dodford, in the county of Northampton, and in 1305 we find that she presented to this rectory as the widow of William. Their son was Lawrence de Ayett, who succeeded, and died in 1350. The arch leading into the northern chancel would appear to be of the period of Edward I., or the time of William de Ayett, while the latter work would bring us down to 1350, the time of Lawrence de Ayett's decease. This family held under the Abbots of St. Alban's, and those abbots were great builders. What more likely than that architects or masons from St. Alban's might have been sent to this church? The beautiful east window of the manor chancel corresponds in some details with work in Hugh de Eversden's lovely Lady Chapel at St. Alban's, and he was Abbot of St. Alban's from 1308 to 1326, when Lettice, the widow of William de Ayett, having presented to the rectory in 1305, was probably living in the Manor-house, and might be employing and solacing the days of her widowhood with church building. The names of Abbots Wallingford, Mentmore, and Thomas de la Mare bring us down to 1350, when Lawrence de Ayett died, so that we may well believe that these proprietors provided the means for the beautiful work we see, and that they sent to St. Alban's for architectural advice and assistance. The Decorated church received alterations and additions during the Perpendicular period. At this time Sir Thomas Barr was lord of the manor,—the monument within the tower is believed to be that of Sir Thomas Barr, who died at Christmas in the year 1421, and his wife. That family remained in possession of the manor for some years, and we may well suppose that the Perpendicular additions were made at that time. These additions consist of the tower, inserted windows, and a doorway. The church was about to be entirely pulled down by the Lord of the Manor, Sir Lionel Hyde, when he built the new Grecian church in 1778, but the work of demolition was prohibited by the Bishop of Lincoln, in whose diocese the parish was then included.

Crossing the Lea, and driving through the charming Lamer Park, the house was reached, and the party kindly received by Mrs. Drake-Garrard. In the hall stands a wardrobe left by Queen Elizabeth when she visited Lamer, a very fine piece of inlaid work. Charles I., accompanied by his chaplain (Hudson) and his faithful friend, John Ashburnham, stayed at Lamer on April 20th, 1646, when hurrying from Oxford to join the Scottish army. As a memento of his visit Charles left behind him two portraits, those of himself and his wife. A drawing of the house as it appeared at the time of the royal visit was shown, and the position of his apartments, and the precautions taken to secure his escape in case of danger, were pointed out. At Wheathampstead House, the residence of Lord Kilcoursie, a portrait of John Bunyan, by Sadler, was inspected, which was discovered by the late Rev. John Olive in the possession of a cottager at Codicote. The Church of St. Helen, Wheathampstead, was then visited.

At No-Man's-Land,—the large common, nearly a mile in length, through which the road from Wheathampstead to Sandridge and St. Alban's passes, the Rev. Dr. Griffith gave an account of the dispute between the men of Wheathampstead and the men of Sandridge as to common rights upon the manors of Westminster and St. Alban's. He said:—The question of the rights of Sandridge and Wheathampstead over No-Man's-Land used to be much disputed both by the parishioners and their lords, the Abbots of St. Alban's and Westminster. The re-erection of gallows there by Richard Wyth, bailiff of the Abbot of Westminster, was soon followed by their destruction one night with axes and swords. This occurred in 1427, during John of Wheathampstead's abbacy. No one knew who did the deed, but the blame was laid on William Waugh, the terror of religious houses and peaceful farmers. Wyth again renewed them. Abbot John, trusting to sound advice about his rights, caused them to be levelled to the ground by the hands of his officers and tenants of Sandridge, in broad daylight, one Saturday. Parish bounds used to be beaten on the Rogation days with religious and other ceremonies. Accordingly, on the next Rogation Monday, the holiday of the great apostle to the Saxons, St. Augustine, quite early in the morning, the men of Wheathampstead finished their perambulations, and then stealthily went out of their way in fear of their very skins, as the chronicler puts it, and planted a slight wooden cross on the site of the gallows. Abbot John, after due consideration, directed the Sandridge bounds to be beaten on Wednesday, after ascertaining that no force of Wheathampstead was prepared for violence. Accordingly, the vicar and men of Sandridge, in due form, singing the Psalms and reciting the Gospels, beat their bounds, asserting their ancient rights thus handed down from time immemorial, and went back uninjured to their several homes. The next year, 1428, a shepherd from Wheathampstead-bury died suddenly on No-Man's-Land while feeding his sheep (perhaps from sun stroke; it was in July). The vicar of Sandridge claimed the body for burial in Sandridge churchyard, but the men of Wheathampstead carried it off into their church, and, without a coroner's inquest it was buried in the churchyard there. In 1429, St. Cutlac's Day, the Bishop of Lincoln, under the authority of the Pope and the English Parliament, came to St. Alban's to hold an inquisition concerning heresy. Wicliffism and Lollardism were giving trouble. The Abbot, ever jealous of his rights of exemption, opened St. Peter's Church,—not the Abbey,—to the bishop. On the same day a baron of the Exchequer, John Fray, accompanied by the clerk to the cellarar, made the round No-Man's-Land to examine into the question. The next day, the bishop's inquisition being over, monks, tenants, and bailiffs of the two Abbeys and Abbot John himself and the Baron met on the ground, and there on one side the documents belonging to Westminster were read, and on the other the evidence of an extremely old Sandridge man, John Adam, was given that,

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while the right of pasture was common to both parishes, the actual soil was of the lordship of Sandridge. Whether the boundary stones now existing were then laid down is more than doubtful, for ten or eleven years later we find suits dragging through the courts and hints of further putting up and pulling down of gallows, but it was at last settled by a jury of twelve men from the neighbourhood, that Robert Belamy, farmer and yeoman, and Matthew Bepsette, gentleman and sergeant of the Abbey of St. Alban's, did no wrong when, on November 24th, 1437, they again pulled down the disputed gallows and carted away the materials.

THE METROPOLITAN BOARD OF WORKS AND THE LONDON THEATRES.

Sir Henry Arthur Hunt, the arbitrator appointed by the Home Secretary, has made his award with regard to Drury-lane Theatre, in respect of which building the Metropolitan Board of Works made certain requisitions to the renters under the Metropolis Management and Building Act Amendment Act of 1878. The points in dispute between the parties were confined to the construction of a new proscenium wall to divide the stage from the audience part of the house, and the provision of a second staircase to the sixpenny gallery, the other requisitions having been practically agreed to by the renters on the advice of Mr. C. J. Phipps. Sir Henry Hunt, by his award, has confirmed the Board's requirement as to the proscenium wall, as well as to the second staircase to the sixpenny gallery; but as regards this latter addition he directs that a staircase to be used in the case of emergency shall be constructed from the sixpenny gallery to the staircase now existing leading from the shilling gallery into Russell-street, instead of continuing the Duke of Bedford's private staircase to the level of the sixpenny gallery as suggested by the Board. The award further provides that each party shall bear their own costs as regards the arbitration, and that the Board shall pay the costs of the award.

PROPOSED NEW WORKHOUSES FOR THE METROPOLIS.

The Local Government Board is rousing the ire of some of the inhabitants and Guardians of the Poor of certain districts of the metropolis by its insistance on the provision of adequate and healthy buildings for poor-law administration. Without committing ourselves to the expression of an opinion yea or nay in favour of all the requirements of the central authority, we are bound to say that of our own knowledge there is good ground for action with regard to at least one of the old workhouses in question. Re-building or enlargement, or removal to other sites, may, and no doubt will, involve increased demands on the pockets of the ratepayers, if only for a time; but, notwithstanding, the necessary accommodation must be provided, so as to avoid overcrowding and other insanitary conditions, with their inevitably attendant and costly evils.

At the meeting of the Guardians of the St. Olave's (Southwark) Union on the 5th inst., a letter was read by the clerk (Mr. J. G. Hawkins), which had been received from the Local Government Board, notifying that, in their opinion, nothing short of the acquisition of the whole of the tan-yard and buildings adjoining the Bermondsey Workhouse would enable the Guardians satisfactorily to carry out their scheme for the concentration of the indoor poor of the union. Mr. Bisley, one of the guardians, observed that that meant an expenditure of 200,000*l*. He heard that quite 45,000*l*. had been asked for the land. Ultimately the letter was referred to a committee.

On the same day a special meeting of the Clerkenwell Vestry was held, to take into consideration a letter lately received by the Holborn Union Guardian Board from the Local Government Board, urging upon them, in the interest of the ratepayers, to expend from 100,000*l*. to 200,000*l*. "in building large palaces for additional paupers," * &c. Mr. Leaver moved a resolution, "That in the opinion of the Vestry the building of a new workhouse at Upton, as proposed by the Local Government Board, for the accommodation of from 1,200 to 1,500 inmates, at an expense of upwards of 100,000*l*., and the closing of the Gray's-Inn-road workhouse, is quite unnecessary, entailing, as it inevitably will, a large additional burden for many years upon our already over-taxed ratepayers, and a great increase in the cost of efficient management of the several scattered institutions of the Board of Guardians." Mr. Brighty moved, as a rider to the above, "That a conference of the vestry with that of St. Luke's and the Holborn Board of Works be held to consider the subject." Mr. Ross opposed the motion in a speech of upwards of an hour and a half, after which the vestry adjourned the further consideration of the subject for a fortnight.

The Guardians of the Wandsworth and Clapham Union, at their meeting on the same day, had under consideration a letter from the Local Government Board, dated the 18th ult., sanctioning the purchase by the Guardians of a site in Allfarthing-lane for 10,000*l*., for the erection of a new workhouse. Mr. Barr asked if it was absolutely necessary to conclude the purchase of the site. The Clerk (Mr. Sanders) said it was. Mr. Barr said that, notwithstanding that, he should move that the new plans prepared for enlarging the existing buildings on St. John's Hill be sent to the Local Government Board for their approval. One plan he (Mr. Barr) had caused to be prepared, for constructing a ward over the stone-yard, showed that they could utilise the present premises, and provide beds for 450 extra patients in the infirmary, at a cost of 21,500*l*., and yet conform to the Local Government Board regulations as to the superficial area to be allowed for each patient. By another plan he produced, for erecting buildings in front of the present workhouse, beds for 520 more inmates in the infirmary, and 160 in the workhouse, could be provided at a cost of 26,598*l*. Dr. Longstaff spoke in support of the purchase of the ground proposed to be bought, and said that neither of Mr. Barr's plans would have the slightest chance of being approved by the Local Government Board. After further discussion the matter was again adjourned.

BIRKENHEAD NEW TOWN-HALL COMPETITION.

The following is the order of merit of the five designs selected by Mr. C. Barry, and the names of their respective authors, viz.:—

1st. "Mersey."—C. O. Ellison, 62, Dale-street, Liverpool.

2nd. "St. Werburgh."—Henry Hall, 19, Doughty-street, Mecklenburgh-square, London; and John H. Eastwood, 16, Red Lion-square, London.

3rd. "Fide."—E. P. Wright, 26, Well-street, Plymouth; and G. B. Rawcliffe, 8, Ormerod-street, Burnley.

4th. "Thorough."—John Sulman, 1, Furnival's Inn, Holborn, London, E.C.

5th. "Fortunio."—W. Tyson Gooch, 29, Guilford-street, London, W.C.

The Council, Mr. Alfred Gill, town clerk, informs us, have selected the design "Mersey," in accordance with the recommendation of the referee.

The following resolution was passed unanimously by the Council:—

"That the cordial thanks of the Council be given to those gentlemen who, accepting the invitation of the Corporation, have submitted designs for the proposed new town-hall; and the Council desire to record their appreciation of the hearty manner in which the profession responded to their invitation, as shown by the number and general excellence of the drawings."

A considerable objection is felt to the site originally fixed on for the new building, a small piece of land projecting from one side of Hamilton-square, and it is urged, we think with very good reason, that the proper place for it is the centre of Hamilton-square itself, if the necessary arrangements for effecting this can be made within any reasonable time. The Council, at their meeting on the 6th, came to a resolution empowering them to reconsider the question of site.

Conservation of Old Buildings.—At the recent Congress of the Social Science Association in Nottingham, Mr. Samuel Huggins read a paper in which he contended, in answer to the question, "What are the proper limits of conservatism in regard to ancient buildings?" that it has no limits.

NEW PUBLIC MORTUARY IN CHELSEA.

At the meeting of the Chelsea Vestry last week, it was reported that the new building erected by that body in the old burial-ground in King's-road was completed, and already in use. The walls are lined with cream-coloured glazed bricks, which can be readily cleansed, and the slabs are marble or slate, according to the various requirements. The roof is high-pitched and open; the windows are partially filled with coloured glass; and the water and gas supply, ventilation, drainage, and other matters are provided for. There are three separate rooms; the larger one has three slabs, which are provided for the reception of accidental and other deaths; another room is fitted up with conveniences for making *post-mortem* examinations, and contains a large galvanised iron air-tight coffin, with a partially glazed lid. This is intended for very bad cases, and the remains could be viewed by a coroner's jury without unpleasantness being experienced. A third room is partitioned off from the lobby, and is provided for the reception of coffins generally, and it is hoped that the poor of the district (especially where there is overcrowding) will avail themselves of this free accommodation as a temporary resting-place for their dead. The building was erected from designs prepared by Mr. George H. Stayton, C.E., the surveyor to the vestry, and has cost over 1,000*l*.

BIRMINGHAM.

At a meeting of the Birmingham Town Council on Tuesday last week, the Mayor brought forward the applications about to be made for the privilege of lighting the town by electricity by various companies, and also the offer to supply the electricity for lighting the town-hall, made by the Messrs. Winfield. As regards the latter the Mayor stated that he had caused a statement to be prepared of the average cost of twenty evenings' lighting by gas, which amounted to 2*l*. 18s. 3d., including attendance, whereas the cost of electric lighting on the basis of Messrs. Winfield's charges would, including attendance, amount to 12*l*. 10s. per evening as near as could be calculated. The whole question was relegated to the Estates Committee for their consideration and report.* E. G.

DICKENS'S EXPERIENCES OF WORKMEN.†

"I am perpetually wandering (in fancy) up and down the house and tumbling over the workmen. When I feel that they have gone to dinner I become low; when I look forward to their total abstinence on Sunday I am wretched. I dream also of the workmen every night; they make faces at me, and won't do anything."

"I thought we were going backward at a most triumphant pace, but yesterday we rather recovered. The painters still mislaid their brushes every five minutes, and chiefly whistled in the intervals, and the carpenters continued to look sideways with one eye down pieces of wood, as if they were absorbed in the contemplation of the perspective of the Thames Tunnel, and had entirely relinquished the vanities of this transitory world." ‡

"Foreman sweet-tempered, but uneasy. Several reams of blank papers constantly spread on the drawing-room walls and sliced off again, which looks like insanity."

"Two men still clinking at the new stair-rails. I think they must be learning a tune. I cannot make out any other object in their proceedings."

"Since writing the above I have been up there again, and found the young paper-hanger putting on his slippers and looking hard at the walls of the servant's room at the top of the house, as if he meant to paper it one of these days. May Heaven prosper his intentions!"

"As to the carpenters, they are absolutely maddening; they are always at work, yet never seem to do anything."

"Joiners are never out of the house, and the carpenters appear to be unsettled (or settled) for life."

"I clearly see that the workmen yet linger-

* We quote from one of the newspaper reports, but we do not suppose that these expressions were used in the letter referred to.

* In the report of Dawson's Memorial, instead of "canopy cast in bronze," read "statue cast in bronze."

† Herewith I forward certain extracts which I have taken (after a careful reading) from the published letters [illegible] Charles Dickens.—F. B.

‡ To H. Austin, October, 1851.

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ing in the yard must be squeezed out by bodily pressure, or they will never go."

"Three paving blouses came to work at the corner of this street last Monday, pulled up a bit of road, sat down to look at it, and fell asleep. On Tuesday one of the blouses spat on his hands, and seemed to be going to begin, but didn't. The other two have shown no sign of life whatever. This morning the industrious one ate a loaf. You may rely upon this as the latest news from the French capital."*

BUILDING PATENT RECORD.†

APPLICATIONS FOR LETTERS PATENT.

4,524. J. S. Willway, Bristol. Gas and oil cooking and heating stoves, &c. Sept. 22, 1882.

4,550. J. Shaw & F. Milan, Lockwood. Apparatus for indicating the presence or absence of water in cisterns, &c. Sept. 25, 1882.

4,592. H. Blair, Glasgow. Ventilating appliances for soil-pipes, &c. Sept. 27, 1882.

4,600. W. R. Lake, London. Devices for the suspension of pictures, &c. (Com. by H. R. Heyl, Philadelphia, U.S.A.) Sept. 27, 1882.

4,618. E. Whillier, London. Firegrates or stoves. Sept. 28, 1882.

4,647. R. C. Thompson, Sunderland. Fasteners for window-sashes, &c. Sept. 29, 1882.

4,652. T. Young and G. C. Wood, Sheffield. Appliances for securing windows and doors. Sept. 30, 1882.

4,655. R. Hudson, Gildersome. Construction of metallic staircases. Sept. 30, 1882.

4,679. J. D. Lampard and F. Coppen, London. Hack-cap for protection of bricks from rain. Oct. 2, 1882.

4,700. S. Sturm, Cologne. Apparatus for use in connexion with stoves, fireplaces, &c., for economising fuel. Oct. 3, 1882.

4,715. J. Bateman, London. Stoves and fireplaces. Oct. 4, 1882.

4,726. W. A. Barlow, London. Door lock or latch checks. (Com. by F. W. Boldt and P. C. A. Vogel, Hamburg.) Oct 4, 1882.

4,727. W. A. Barlow, London. Trapping sewers and drains. (Com. by L. Henry, Brussels.) Oct. 4, 1882.

4,731. J. Drewitt, London. Connecting spindles to locks and latches, &c. Oct. 4, 1882.

4,739. A. Gandebeen, Brussels. Ventilators. Oct. 5, 1882.

4,743. H. Hancock, London. Fastenings for doors and window-sashes. Oct. 5, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named :—

Sept. 26, 1882.

2,395. H. Greenhous, Worcester. Fireplaces. May 22, 1882.

2,477. J. Smith, Liverpool. Domestic fireplaces. May 25, 1882.

2,530. H. Ransford, Brighton. Domestic stoves or fireplaces. May 27, 1882.

3,340. A. Drummond, Edinburgh. Appliances for securing glass to astragals and sash-bars. July 14, 1882.

Sept. 29, 1882.

3,832. L. Dove, London. Self-acting steam traps, &c. Aug. 11, 1882.

Oct. 3, 1882.

2,590. T. H. P. Dennis, Chelmsford. System of glazing, &c. May 1, 1882.

Oct. 6, 1882.

3,928. C. A. Jones, Gloucester. Steps or ladders. Aug. 16, 1882.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending Sept. 30, 1882.

537. B. Verity, London. Burners for gas fires. Feb. 3, 1882. Price 6d.

These are made of fire-clay and silicate, and have two horizontal chambers, in the lower one of which the gas and air are mixed and heated. This lower chamber communicates with the upper one at both ends, and in the perforation of this upper chamber the gas is burnt.

746. T. F. Wintour, London. Ventilating apparatus. Feb. 16, 1882. Price 6d.

These ventilators are made in a conical form, of perforated metal or wire gauze, and placed in the window or chimney-shaft, &c. The amount of air allowed to pass through is regulated by a disc of metal or mica placed inside the cone.

847. W. Meakin, London. Sash-pulley. Feb. 21, 1882. Price 4d.

The frame is cast solid, and in each of the sides is a slot, in which the axis of the pulley revolves. The pulley and its axis are also cast in one piece.

850. J. Everard, Birmingham. Raising and lowering blinds. Feb. 21, 1882. Price 6d.

A lever is eccentrically suspended below the pulleys of the blind cords, and a horizontal slot is formed in the frame opposite the lever. The cords pass between the lever and the frame. When it is desired to hold the cords, the lever is pulled so as to join the cords in the slot; and when the cords are pulled, the lever falls down, and the cords are free.

875. J. Slater and R. Pollock, Edinburgh. Shoring or supporting buildings in course of alteration. Feb. 23, 1882. Price 2d.

Instead of using horizontal wooden beams, &c., a series of iron boxes are inserted at intervals into the wall, which project outside the same. These outer ends are supported by dumb screws. The masonry can then be removed, and the new beams inserted. (*Pro. Pro.*)

888. H. Sutcliffe, Halifax. Manufacture of apparatus connected with water-closets, &c. Feb. 23, 1882. Price 8d.

These are all made in two halves, and cast in permanent moulds or patterns, and then are joined together by bolts passing through lugs cast thereon.

893. A. Jamieson, Blantyre. Apparatus for mixing concrete. Feb. 24, 1882. Price 6d.

The materials are passed through a revolving horizontal cylinder, in which is a shaft with helical or screw blades, which revolve in the opposite direction.

895. C. Hibbs, Plaistow. Decorative coverings for walls, ceilings, &c. Feb. 24, 1882. Price 2d.

These consist of pieces of glass of various shapes, accurately fixed together, and coloured as required. They are secured on the wall, &c., by a fine cement. (*Pro. Pro.*)

925. W. H. Lascelles, London. Earth-closets. Feb. 25, 1882. Price 6d.

A rotary receptacle is provided for the soil. Each compartment of this receptacle as it revolves is filled with earth, and, after using, is again revolved, when the earth and soil fall into a suitable pit, the earth being uppermost.

934. J. Carpenter, Southampton. Apparatus for opening, closing, supporting, and locking window-sash frames, &c. Feb. 25, 1882. Price 2d.

The sash has a rack, with ratchet teeth on its side, and bolts pass through a plate on the frame, and engage these teeth. These bolts are pressed out by springs, and held back by cords and levers. (*Pro. Pro.*)

861. H. J. Haddan, London. Closet valves. (Com. by W. Rudiger, Berlin.) Feb. 22, 1882. Price 2d.

To prevent the valve closing suddenly, a piston is mounted on the valve spindle, which is movable in a cylinder to which water is admitted, and only allowed to flow out slowly. (*Pro. Pro.*)

Published during the week ending October 7, 1882.

911. J. Parker, Kilmarnock. Manufacture of bricks and tiles. Feb. 25, 1882. Price 6d.

The bricks, after drying, but before firing, are passed through an apparatus and dressed so as to remove any excess of material or inequalities.

914. S. S. Hellyer, London. Water-closets, urinals, &c. Feb. 25, 1882. Price 6d.

The overflow trap of a valve closet is connected with the vent-pipe of the valve box above the level of the valve. The inlet pipe of the basin is connected with the overflow pipe thereof by a passage moulded in the basin. The syphon trap of a urinal basin is made in one piece with the back of the basin.

918. H. J. Haddan, London. Ventilators. (Com. by P. Mihan, Massachusetts, U.S.A.) Feb. 25, 1882. Price 6d.

These have a mouth on one side of the hood, and the entrance or exit of the air by or from this mouth is governed by two hinged deflectors.

950. W. P. Borwick, London. Window and other fastenings. Feb. 27, 1882. Price 6d.

A short vertical bar is placed in the end of the lever arm of the fastener, which drops down in a slot or beyond the plate of the lower sash when the fastener is closed, and locks the same.

956. C. D. Abel, London. Ventilating apparatus. (Com. by E. Oehlmann, Berlin.) Feb. 27, 1882. Price 6d.

A turbine carries on its shaft helical blades or vanes, by the rotation of which the air is propelled as required. Two jets of water are used to turn the turbine in the different directions required.

967. F. Wirth, Frankfort. Stoves for warming rooms, &c. (Com. by E. Schoneberg, Brockenheim, Germany.) Feb. 28, 1882. Price 2d.

These consist of a pedestal within which is the fire receptacle surrounded by a fire-brick ring with circular holes, through which the gases escape and are consumed by the heated air inside the pedestal. (*Pro. Pro.*)

980. T. le Poidevin, Guernsey. Machinery for moulding bricks, &c. Feb. 28, 1882. Price 6d.

The pug-mill has discharge orifices in the bottom, and the moulds pass in succession under the pug-mill and receive the clay therefrom. In these moulds the bricks are pressed.

999. G. Wilson, New Cross. Apparatus for fastening scaffold-poles, &c. March 2, 1882. Price 2d.

Two jaws are hinged together, and inserted under the lashings of the scaffolding and a wedge-shaped piece is driven in between the two jaws. (*Pro. Pro.*)

2,794. C. Hulseberg, London. Boilers for heating buildings, &c. June 14, 1882. Price 6d.

For heating buildings, &c., by hot-water boilers are used of a saddle-shape, which are divided into two separate parts along the crowns. Flues may be made through the crown and the internal shell may be corrugated. Each half is cast or wrought separately and placed together in the usual brickwork. When the boilers are cast, the outer side plates are made separately, and secured to the internal shells of the two separate halves.

CASES UNDER METROPOLITAN BUILDING ACT.

WOODEN CONSTRUCTION.

Mr. Henry Jarvis, District Surveyor of Camberwell, on the 4th inst. summoned Mr. Robinson, of 23, Peckham-grove, builder, before Mr. Ellison, at the Lambeth Police Court, for having erected a building enclosed on three sides with wood and glass, which was not in accordance with the Building Act.

The defence set up was that the erection was only a shed and not a building, and was exempt from the operation of the Act, and that the defendant was induced by the District Surveyor to give notice under compulsion.

The District Surveyor urged that the building was a workshop with two work-benches in it, and that the defendant used it as a workshop; that upon the first discovery he acquainted the defendant that he had subjected himself to a penalty for not having given notice, and that unless he took down the building, or gave due notice, and amended the irregularity in it, proceedings would have to be taken to have the penalty enforced; and upon this the defendant gave notice.

After examining the drawing of the building, and, hearing further evidence, the magistrate made an order for the building to be pulled down at once, or walls to be built to enclose it, and for the defendant to pay 32s. costs.

WILKINSON'S GRANITE CONCRETE PAVING.

Sir,—With reference to an article in your paper of the 9th ult., *re* "Cement, Vulcan, and Asphalte Floors," it mentions that a great difficulty is experienced in finding a material to construct tanks for acid.

We may state that our material is extensively used for tanks in the chemical works on the Tyne and Wear; it is an economical material, and thoroughly resists the action of the acids where brick, lead, zinc, galvanised iron, and other materials have signally failed. W. B. Wilkinson & Co.

SEWER VENTILATION.

Sir,—The Littlehampton Local Board of Health has lately completed a system of sewerage said to be on a "very scientific principle." There are a considerable number of manholes with "patent charcoal ventilators" connected with the sewers, but lately the authorities caused these scientific ventilators to be stopped up with street mud to prevent them from stinking the visitors out of the town. I should like to know where the sewer-vapours and gases go when the sewers are tide-locked? I am so ignorant I cannot see wherein the scientific principle lies. A Poor Buffer.

FINCHLEY SCHOOL-BOARD COMPETITION.

Sir,—In the *Barnet Press* of last week the report of a Finchley School-Board meeting (extract enclosed) states that a letter was read from me, "offering to assist the Board gratuitously in taking into consideration the erection of the new Board schools."

This statement is erroneous. As a resident, and otherwise interested in the parish, I addressed to the Board a letter, suggesting that, in the conduct of the competition (in which individually I should take no part) they might adopt the principal recommendations made by the Institute Committee, of which I am a member, viz.:—

1. To appoint an experienced architect as assessor, to advise in drafting the conditions of the competition, and selecting the best designs.

2. Instead of premiums, to award *each* selected competitor a sum of money, to compensate him for time and costs.

3. To engage the authors of the chosen designs to carry out their work.

The foregoing (in brief) is a summary of my proposals. To offer gratuitous or other services was never in my mind; indeed, to have done so, under the circumstances, would have been in such bad taste, to say the least, that I will ask you to give me space in your columns for this disclaimer. Samuel Knight.

* Written to Edmund Yates, September, 1865.

† Compiled by Hart & Co., Patent Agents, 28, New Bridge-street.

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SEWERAGE WORKS.

Harrow.—Mr. J. Thornhill Harrison C.E., one of the inspectors of the Local Government Board, has held an inquiry as to the propriety of granting permission to the Local Board to borrow a sum of 6,500*l.* for the proposed sewerage works for Roxeth and Sudbury Hill. The number of inhabited houses with which it was proposed to deal under the scheme was 486, with an estimated population of 2,500 at the outside. The acreage of the land which it was proposed to purchase was 28½ acres. It was intended to deal with the sewage by irrigation on that land. The drainage of the district at present was disposed of by four outfalls. The northern portion of Harrow was drained to the Greenhill Irrigation Farm of 17½ acres, near the railway station. On the south there were some tanks at Sudbury Hill, which were partially affected by the present scheme. On the east there were some other tanks at Sheepcote, where the sewage was treated. The western and south-western districts were those affected by the present scheme. There was there a system of sewers draining into the natural watercourses in the low-lying part of the district. Those watercourses discharged into a brook called the Yedding, and so into the Thames. That state of things had, for a long time, caused many complaints to be made to the Local Board. Mr. Alfred Williams, C.E., is the engineer of the scheme.

Burslem.—At a monthly meeting of the Burslem Town Council on the 4th inst., Councillor Ball, in proposing a resolution of which he had given notice, for sub-letting the sewage-farm, said the farm, under the management of the Farm Committee, had, up to the present time, been worked at a loss, although he wished it to be distinctly understood that he did not blame the committee, who had striven hard to win success, and it was their misfortune and not their fault if that had been denied them. The impoverished condition of the land when the farm was entered upon, the drainage and other works required to be done, put any immediate pecuniary benefit out of the question, but when the loss in a single year doubled the estimated amount it looked as if there was something radically wrong. The estimated loss for the year ending March 25 last was 499*l.*, but the actual loss was 998*l.* 6s. 6d. If they added to that, as they were fairly entitled to do, 101*l.* 9s. 6d. as interest on 2,029*l.* 11s. 4d. sunk in stock, for which they got no return, they had a total loss of 1,099*l.* 15s., representing a rate of 3¼d. in the pound. Alderman Hulme supported the resolution, and said something like 3,000*l.* had been lost on the farm, and he contended that there ought to have been no loss. It might have been sub-let for the rent they paid,—many farms not so good were let at 50s. an acre. Councillor Maddock said he did not believe the actual loss on the farm had been so great as had been represented. They had not stocked the farm, and grass was rotting for want of cattle to eat it. The resolution was adopted, and the best mode of carrying it into effect was referred to the committee.

PROVINCIAL NEWS.

Booth (near Halifax).—On the 30th ult., a "rearing supper" was given to the men employed in the erection of the new co-operative store here for the Luddenden and District Co-operative Society, on the completion of the roofing and closing-in of the building. Mr. Patchett, of Halifax, the architect, has paid great attention to the lighting and ventilation. Each floor is fitted up with special inlets for fresh air, and outlets for foul. The drainage of the new store, as well as that of the houses adjoining, recently purchased by the society, is arranged externally on the intercepting principle, for the prevention of sewer-gas entering the interiors. The masons' work has been carried out by Rowland Gaukroger, the contractors for the other trades being J. & S. Murgatroyd, carpenters and joiners; Jonas Alderson, plumber, glazier, and gas-fitter; and J. & T. Alderson, slaters and plasterers.

Waterloo (Liverpool).—Seafield House, situate on the sea-cost between Seaforth and Waterloo, has lately been opened as a marine hotel and hydropathic establishment, under the auspices of the International Marine Hydropathic Company. The building has a frontage to the sea of 659 ft., and stands in extensive and beautifully laid-out grounds, attached to which are conservatories, winter gardens, vineries, and fruit-houses, under glass, designed by Mr. Ed. Kemp, landscape gardener. Between the house and the sea, and parallel with the promenade, is a large lake, 650 ft. long, containing many million gallons of pure filtered salt water, which is brought from the Perch Rock, constantly pumped in at one end, the outflow being at the other. The depth of the lake is 5 ft. or 6 ft., and in summer it is intended to utilise it for bathing on the American and Continental system. The grounds in front of the house include accommodation for lawn tennis, archery, bowls, quoits, &c., and there is, besides, a music pavilion. The chief entrance to the building is from the Waterloo-road, to which it has a frontage of about 653 ft. In this part of the estate there are ten acres of lawn, intersected by finely-gravelled walks, gay with neatly-kept flower-beds, and the trees which border the grounds amply shelter the house from the east wind. On the extreme south-east are extensive stabling, coach-houses, shippon, fowl-houses, and other accessories, all of which are constructed of Yorkshire and Stourton stone. Messrs. W. H. Weightman & Sons, Liverpool, are the architects of the north wing. Messrs. John Collin & Son, of Warrington, have executed the entire contract for the building; and the other contracts for the various work in connexion with the establishment have been performed by the following firms:—Messrs. Homan & Rodgers, Messrs. G. Atkin & Co., Messrs. Bennett Brothers, Messrs. T. Jones & Co., Messrs. S. Moss & Son, Messrs. G. H. Whitaker & Co., Mr. Robt. Pitt, Mr. John Wallace, Messrs. J. Bramham & Co., Messrs. Mee & Co., and the Gas Fittings Company, Liverpool; Messrs. Laidlaw & Son, Glasgow; Messrs. Alex. M'Intosh, Kirkcaldy; Messrs. Kendal, Milne, & Co.; Messrs. Parker & Brown, Messrs. W. & J. Openshaw, Messrs. Richardson, Tee, & Rycroft; Messrs. Brown, Davies, & Co., and Mr. W. Wilson, of Manchester. The engineering work was entrusted to Messrs. Bradford & Son, Crescent Ironworks, Manchester, whose representative on the works was Mr. Alfred Giles. Mr. Miller was the clerk of the works.

THE WAY WE CONTRACT IN ASHFORD.

Sir,—The first three undermentioned were invited to tender for siding into our gasworks, oak girders on brick piers. After our tenders were sent in, another was invited and accepted at 10s. above the lowest one invited at first; but why, we have not the pleasure of knowing, after the time and expense of estimating:—

Edwd. Dryland	£196 8 0
Steddy & Co.	195 8 0
Jas. Wood	192 10 0
Howland Bros.	193 0 0

Edwd. Dryland, Builder.

CHURCH-BUILDING NEWS.

Northaw.—The dedication of the new parish church of Northaw, Herts, which has been erected in place of the one burnt down on the 20th February, 1881, took place on the 28th ult. by the Bishop of Colchester, acting for the Bishop of St. Albans. The new church having been built on the site of the old one, in the centre of the village, consecration was not necessary. The destruction of the old building was caused by some defect in the heating apparatus, in which a fire had been lighted on the Saturday evening in preparation for the Sunday morning service. The style of the new building is Decorated Gothic of the fifteenth century, and it consists of a nave, chancel, north and south transepts, and south aisle, with porch, and a substantial square tower 84 ft. high. The exterior walls are of Ancaster stone, rock faced, the roof being covered with green slates. The tower,—which contains a clock-room, ringing-chamber and belfry, on three floors,—has four pinnacles, with carved crockets and carved finials to the gables. The east window and that in the tower are filled with stained glass by Messrs. Ward & Hughes, of Soho. The open roof is of stained deal in two shades, while the whole of the seats are of oak, those in the chancel having carved ornamentations. The floor is covered throughout with Minton's tiles. The altar is approached by three tiers of steps formed of Derbyshire marble, while columns of the same kind of marble support the arcade by the transepts. The south aisle is divided from the nave by an arcade of moulded arches and columns, in five bays, all the walls being of plaster stucco of natural colour. The pulpit, the cost of which was defrayed by subscriptions raised by Mrs. Bonsey, is of Ancaster stone, and contains elaborately-carved figures of the four Evangelists standing in canopied recesses. The doors are of oak, and the church will be heated by a Gill stove, by Barton, of Boston. The organ, built by Willis, of London, has been presented by Mrs. Kidston. The interior fittings of the church are mostly of brass, and are the gifts of different members of the congregation. The architects are Messrs. Charles Kirk & Sons, of Sleaford, the diocesan architects for Lincolnshire; and the builder was Mr. John Bentley, of Waltham Abbey. The church is intended to seat about 250, and the cost of it has been, in round figures, 7,000*l.*

Essendon (Hertfordshire).—The Parish Church of Essendon is about to be renovated, under the direction of Mr. Wm. White, F.S.A. The whole was completely modernised some years ago; and it is at present a wonderful specimen of what church arrangement ought not to be. The tower was rebuilt some 210 years ago.

Newtown (Exeter).—The Bishop of Exeter has just consecrated the new Church of St. Matthew, Newtown, Exeter, which has been built as the first instalment of a work of church extension in the city resolved upon some two or three years ago. The building is not yet completed, the chancel and upper part of the tower having to be added hereafter. In a competition confined to the Exeter architects, the plans of Mr. R. M. Fulford were selected; and subsequently the contract for the erection of the first portion of the building was given to Messrs. Luscombe & Son, of Exeter, for 6,000*l.* The memorial-stone was laid on June 9, 1881, by the Mayor (Alderman Pring). The style of building is Early First Pointed, and the material chiefly local red brick. The brick walls are relieved by string-courses and bands of Box-ground Bath stone and deep-red moulded brick, while the dressings of the windows are of Bath stone. The chief ornamentation is on the west front, which faces the roadway. There are double western doors, composed of oak. Above them is a traceried tympanum, glazed with coloured glass, and small windows on each side of the doors to light the entrance-lobby under the gallery. The arch of the dome over the doors is composed of Bath, Pocombe, and Lias stone, while in the head of the gable over the door is a Bath stone niche, in which, at some future date, it is intended to place a figure of the patron saint of the new parish. At present the tower is only carried up to about the level of the nave-roof, and to complete it 1,000*l.* more will be required. The shafts of the columns in the nave are of grey granite, with carved bases and caps of Hamhill stone. From these pillars spring pointed arches. The voussoirs of the arches are alternately of Pocombe and Corsehill (Dumfries) stone. The east end of the nave is backed with a temporary alcove, which will remain until such time as the chancel, the foundation of which has already been laid, shall be completed. The choir-stalls at present project into the nave, from which they are divided by a temporary wooden screen. Above the arches in the nave, light is admitted by means of small pointed windows, fitted with cathedral glass, with coloured heads. The transept arches are of Hamhill stone, with Hampshire brick moulding and a Hamhill label outside. The roofs of the nave and transepts are barrel ones of pitch-pine, and the same material is used for the lean-to roofs of the side aisle, around the walls of which a dado of coloured tiles is to be fixed. The clearstory windows, six on each side, are two-light ones, with small quatrefoil and trefoil lights above. In the western tower, immediately over the entrance-lobby, is a gallery approached by a newel staircase. The front screen of this gallery is of carved Hamhill stone, supported by Corsehill stone columns on Hamhill bases. The gallery is lighted by a large west window, already described, and a small side window. On the west side of the tower is the baptistery. The bowl of the font is of Caen stone, and the die of Corsehill, surrounded by six columns of Devonshire marble. The base is of Caen stone, resting on two blue-lias steps. The builder, Mr. Luscombe, has had all the carving executed by his own workmen. The floor in the centre of the nave is laid with Minton's tiles, and the entrance-lobby under the gallery is paved with the same material. The rest of the floor is laid with wooden blocks. The whole of the glazing has been done by Mr. F. Drake, of the

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Cathedral-yard, while the lighting and warming have been entrusted to Mr. F. M. Rice.

London.—Extensive alterations are being made in the Church of St. Saviour, St. George's-square, S.W. In the nave the unsightly galleries have been removed. The caps, label terminations, and bosses supporting the roof have been elaborately carved. The latter form an "angelic choir." A wooden floor has been laid under the seats, and two parish rooms are being constructed in the tower. In the chancel a canopied reredos, with central group of the Last Supper and side figures, is being erected. The arcades on the north and south sides contain bishop's throne, sedilia, and piscina, with credence. The walls and roof are being richly decorated by Messrs. Clayton & Bell, and the floor relaid with polished marble slips and encaustic tiles from the architect's design by Mr. J. C. Edwards, of Ruabon. A brass corona is being made by Messrs. T. Potter & Sons, of South Moulton-street. With the exception of the corona, tiles, and mural decoration, Mr. Thomas Earp, of Lambeth, has executed the whole. The entire work is from the designs, and under the superintendence, of Messrs. Romaine-Walker & Tanner, architects, 19, Buckingham-street, Adelphi. —— During the past few weeks workmen have been employed in making some welcome and much-needed improvements in the church of St. Mary Aldermary, which will tend greatly to the comfort of the congregation worshipping there. For some time past it had been observed that the north and south walls of the church had become damp and greatly disfigured, especially in the winter season. Accordingly it was resolved to thoroughly dry the walls and line them with an oak dado; and the work, which is now nearly completed, has been carried out by Mr. Howard, builder, of Upper Gloucester-place. The dado is of Gothic design, surmounted by a cove-cornice with drop-tracery, and is enriched with mouldings and carved work.

Bury (*Lancashire*).—On the 7th inst. the memorial-stone of the new Church of St. Mark, Bury, now in course of erection, was laid by the Rev. Canon Hornby, Rector of Bury. The new church is being erected in the midst of a dense population, to take the place of a schoolroom which is at present used for public worship, and is from the designs of Mr. J. Wreghit Connon, of Leeds, and Mr. James Demaine, of York, architects.. The cost of the building, exclusive of the tower and spire, is 4,750*l.*, and the contract has been let to Mr. Charles Myers, of Leeds, for that sum, being nearly 2,700*l.* less than the tenders from Bury.

DISSENTING CHURCH-BUILDING NEWS.

Abingdon.—On the 5th ult. special services were held in the Baptist chapel in Ock-street, on the occasion of the re-opening of that place of worship after being closed for seventeen weeks, during which period the exterior and interior have undergone thorough renovation. The work has been carried out by Messrs. Buckell & Wheeler, builders, and Mr. D. Stroud, painter and decorator, of Abingdon, at a total cost of something like 700*l.* The whole of the outside of the building has been overhauled, the stonework scraped, and the woodwork painted. The interior, with the exception of the gallery, has been entirely re-seated with low stained pews. It is heated with hot-air apparatus furnished by Haden, of Trowbridge.

Crewe.—A new chapel and school are about to be built at Hightown, Crewe, for the trustees of the United Methodist Free Church. The chapel will seat 700 adults, and the school 250 scholars. Suitable vestries, class-rooms, and outbuildings will be provided. The builder is Mr. A. P. Cotterill, of Crewe; and the buildings have been designed by Mr. S. Hurst, of the firm of Maxwell, Tuke, & Hurst, architects, Southport.

Blowick.—Extensive alterations and additions are being made to the Wesleyan Chapel, Blowick, Southport. The additions comprise six large class-rooms, a library, and a detached lecture-hall, &c. The builder is Mr. T. Duxfield, of Southport; and Mr. S. Hurst, of the firm of Maxwell, Tuke, & Hurst, Southport, is the architect.

Drumbo.—The new Drumbo Presbyterian Church, just opened, has been erected on the same site as the old edifice (which dated from 1660). The plan of the new church comprises a nave, 68 ft. long by 27 ft. wide, and two side aisles, each 14 ft. wide, with a height of 33 ft. to the plastered ceiling, which is flat throughout. The columns dividing the aisles are of cast iron, of such dimensions as to avoid the usual attenuated appearance of columns of that material. Five semicircular arches on each side spring from the capitals of the columns, and are enriched with moulded panels, above which project corbels carrying the roof timbers. The galleries are pitched at an angle which enables every one to have an uninterrupted view of the platform. The principal front of the church is broken by a slight projection with pilasters at each angle, and terminating in a gable, with elaborate finial. At each side are placed wings containing the staircases. A group of three large semicircular-headed windows is placed in the upper part of the gable. These are enriched with pilasters with moulded caps, on which rest a richly-moulded arch. The side buildings have parapets with blockings, broken with pilasters with ornamental terminals. The sides of the building are treated in harmony with the front. On each side of the platform are doors opening into a spacious session-room, below which is placed the hot-water apparatus, which was supplied by Messrs. W. M'Neill & Co., Corn-market, Belfast. The church contains upwards of 980 sittings. The work has been executed by Mr. Hutcheson Keith, Glenravel-street, from the designs and under the superintendence of the architects, Messrs. Young & Mackenzie, Belfast.

Bulwell (*Notts*).—The memorial-stone of a new Wesleyan chapel and school at Bulwell was laid on the 20th ult. The new building will include a chapel, designed to seat 685 adults, and a school-room with six class-rooms, which will accommodate 500 children. There are also to be a minister's vestry, and a complete provision of lavatories and other appurtenances. The edifice is designed in the Gothic style of architecture of the twelfth century. Bulwell stone, rock-faced, will be used throughout, except in the dressed and weathered parts of the building, where Matlock stone will be utilised. The site required that the schoolroom should be under the chapel, but it will be entirely above the level of the front street, and the access to the chapel will be by flights of steps right and left. The building is estimated to cost 3,550*l.* The architect is Mr. John Wills, of Derby, and the contractors are Mr. Thomas M'Culloch, of Bulwell, and Mr. Joseph Monks, of Hucknall Torkard.

Books.

Tenth Annual Report of the Local Government Board. 1880-81. London: Eyre & Spottiswoode, 1882.

This, which is a volume of considerable thickness, consists mainly of a Report and papers submitted by the Board's medical officer, Dr. Thorne Thorne, on the Use and Influence of Hospitals for Infectious Diseases, and contains so much that is of interest to architects that the profession will be doubtless glad to know it is published. Dr. Thorne Thorne has been engaged for a considerable period in examining the various hospitals for infectious diseases throughout the provinces, and has embodied in his Report a vast amount of valuable information relating to sites and soil, general arrangement of infectious hospitals, their construction and details, as well as cost of erection, management, &c., and the effect of hospitals on the localities in which they are placed, that cannot fail to be of interest and assistance to all who are immediately concerned in the erection of such hospitals. And although the Report relates only to infectious hospitals, it is, we think, one of the most valuable additions to the literature of the subject since the important Report by Holmes and Bristowe nearly twenty years ago.

Referring to that Report, and bearing in mind the vast changes and improvements that have taken place since it was issued in the construction of hospitals generally, both on the continent of Europe and in America, it would be of great advantage, as it seems to us, if steps were taken to procure complete information upon the subject up to the present day in the form of a report like that of Dr. Bristowe and Mr. Holmes, and it is to be hoped that before long such an investigation may be ordered.

Miscellanea.

A Migration of Railway Workpeople and its Consequences.—Most of the workmen at Crewe works who some months ago received notice to take up their residence in or nearer Crewe have left Nantwich. Some few exceptions have been made in the case of those who have families engaged in manufacturing establishments and others who have leases of their premises. One consequence of the order which has been enforced by the railway company is apparent in the large number of empty cottages in various parts of the town. It is stated by one gentleman that, taking a walk a few days ago through Beam-street and Volunteer-terrace in the direction of the Barony, he counted no fewer than fifty houses to let. This number might be almost trebled if all the tenantless houses in other parts of the town were included, and the wholesale deportation of workpeople and their families to Crewe and elsewhere cannot fail to have a disastrous effect upon a certain portion of the shop-keeping community as well as upon many property-owners whose houses have been emptied wholesale.—*Chester Courant.*

Pontefract Castle.—The ruins of this historic structure, and the land around them, have recently been excavated and explored, with the object not only of finding some relics of the warlike past, but of converting the place into a pleasure-ground for the inhabitants of the town. During the exploration many interesting discoveries have been made. Old armour has been dug up, as well as cannon-balls, bullets, coins, and pottery. The foundations of the drawbridge and the remains of the Constable's Tower are (according to the *Daily News*) now indicated, and near the ruin hitherto supposed to be St. Clement's Chapel, six skeletons were unearthed. One of the most historic parts of the castle is the ruin of the Swillington tower, in which Thomas, Earl of Lancaster, passed the night prior to his sorry ride up the hill of St. Thomas, on his way to the block and the headsman's axe.

Neath Harbour Works.—These new works are making rapid progress. The contractor, Mr. C. E. Daniel, having invited the commissioners to go over and inspect the works, they, together with the engineer, Mr. W. Wilson, C.E., and other officials, went from Neath on the 5th inst. to Court Sart-road, and were met by the contractor and others. They proceeded along the junction with the Great Western Railway across the Neath Canal, Lord Jersey's and the Gnoll Marshes, to the Navigable Cut, which they inspected minutely, together with the whole of the plant, and expressed their satisfaction with the progress made, as well as with the quality of the materials used. There are about 500 men on the works, and others will at once be employed, so as to proceed as rapidly as the nature of the works will permit.

School of Art Wood Carving, Royal Albert Hall.—The school has re-opened after the usual summer vacation, and we are requested to state that free studentships in both the day classes and the evening classes are at present vacant. These studentships are maintained out of funds provided by the City and Guilds of London Institute for the Advancement of Technical Education. The school is open to amateurs as well as to those who intend to make wood-carving a profession. To those who are unable to attend the classes information can be given by letter and examples supplied. Information, with forms of application and prospectuses of the school, may be obtained by personal application, or by letter, addressed to the manager, School of Art Wood Carving, Royal Albert Hall, Kensington.

Pictures at Manchester.—The annual autumn exhibition of paintings at the Royal Manchester Institution, now open, is once more spoken of with confidence as the last that will be held before the Institution becomes the property of the citizens and the exhibitions pass under the control of the municipal authorities, who will have 2,000*l.* a year to spend in purchases, and a committee of connoisseurs to advise and assist. The matters of difference which for some time hindered the acceptance of the gift of the Institution from its proprietors are reported to have been finally arranged. Taken as a whole, the present exhibition is not of so popular a character as last year's.

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The Pollution of the Thames.—At the meeting of the Court of Common Council on the 5th inst., Mr. Stoneham asked whether the chairman of the Port Sanitary Committee could give the Court any information as to the progress made by his committee in the matter of the prevention of the pollution of the river Thames. Also whether the chairman could tell the Court what progress had been made by the floats placed in the river at Crossness and Barking, nearly three weeks ago, and how long, judging by the test, it takes for the sewage to reach the sea. Mr. Davis (chairman of the Port of London Sanitary Committee) replied, that they were taking very active steps in this inquiry, but it was impossible at the present moment to give any decided answer to the first question. As to the second question, regarding the floats, there was, unfortunately, some little delay. The floats were not quite suitably constructed, and they were replaced in his presence on Sunday. This was a continuous work, and if they lost one tide the experiment would be worth nothing. The float that had reached the furthest point towards the sea was at Shorley battery, about two miles below Gravesend. Only three floats reached there within from seventeen to nineteen days. There was only one float up the river towards Richmond, which had got as far as Chelsea. One float, by some extraordinary circumstance which had not yet been explained, had never left Barking, but was still in the neighbourhood of the sewage.

Notes from Rome.—A new quarter of handsome villas is being built in that portion of the gardens of Sallust which formerly belonged to the Barberinis and now belongs to Spithöver, the librarian. A correspondent of the *Athenæum* says,—Many works of art and remains of buildings have been found in cutting and levelling the new streets. Near the junction of the Via Venti Settembre and the Via Salaria the temple of Venus Erycina, otherwise called "Venus hortorum Sallustianorum," has been found, an imposing structure, some 100 ft. long and 50 ft. wide. Only the foundations remain, made of rubble work, so hard and strong that dynamite has been used to blow them up. The walls are 8 ft. thick, and are sunk to a depth of 45 ft. Such an excess of solidity is not out of place, as the temple stood on the embankment or agger of Servius, made of loose earth. Of the thirty-two columns of the peristyle, and of the marble cella, steps, and entablature, not a trace, not an atom, has been discovered, an example almost unique of wholesale destruction. Sixty-four feet below the platform of the temple, at the bottom of the fosse or moat which protected the agger from the outside, a statue was found, representing Endymion dozing on the Rocks of Mount Latmos. It is of natural size, of good if not perfect workmanship, and in a wonderful state of preservation. The attitude of the wearied huntsman is graceful, and must have pleased Diana, whose figure, however, is still missing.

York.—The memorial and monumental cross to the late Provost Render has been fixed in its position at the Cemetery, York. The height is 13 ft., the tomb is 7 ft. 6 in. long, 3 ft. wide, and 2 ft. 6 in. high. The cross is richly foliated, and springs from a moulded and carved capital. The style of the design is simple and broad. The design was furnished by Mr. G. Goldie, of London, the architect of St. Wilfred's (R. C.) Church, York, the erection of which was mainly due to the exertions of Provost Render. At the foot of this monument is a tomb (also designed by Mr. Goldie, more than thirty years ago) under which repose the remains of Dr. Render's immediate predecessor, the Rev. Thomas Billington, who died a martyr to charity in the year of pestilence, October 1st, 1847, aged 53. This tomb, which had suffered considerably from the weather, has been taken down and refixed during the past week by Mr. G. W. Milburn, by whom the design for the memorial cross for Dr. Render was carried out.

Typhoid in a New Building. — Typhoid fever has broken out among the men of the Metropolitan Police located in Portsmouth Dockyard. Two fatal cases have occurred; a third serious case has been taken to Haslar Hospital, and several milder cases are reported. The police are quartered in a new pile of buildings, which has been erected in the Extension Works, and the outbreak is attributed to defective drainage.

Lace and Fan Exhibition at Brighton.—On Saturday last a loan-exhibition of laces and fans was opened at the Brighton Aquarium. Lady Brassey is an abundant contributor, and to her kindly aid the success of the exhibition is largely due. The articles her ladyship has sent occupy a prominent place in the centre of the entrance-hall, having a whole case devoted to it. The most curious specimen Lady Brassey has sent is an antique piece of old Flemish lace, representing in crude eccentric figures what the work tells us is the "Nativite dus enfant Iesus." There is a good display of fans, for which there are three divisions, for which the directors offered a series of prizes. In the first, for modern hand-painted fans, the first prize (five guineas) was awarded to Mons. M. Mace; the second (three guineas), to Miss Dawes; the third (two guineas), to Miss Edelston. Miss Alice Grant, Miss Ada Moore, and Miss M. Jones were commended in this class. For hand-painted designs or mounts, Miss A. J. Edelston takes the first prize (3*l.*); Mrs. L. C. Arthur, the second (2*l.*); and Mrs. Freeman Gell, the third (1*l.*). Miss Mina Parks-Smith was highly commended. For collections of antique fans, the first prize, the company's gold medal, was awarded to Mr. Edward Joseph, for a set of ten fans, illuminated with historical subjects. Lady Brassey was awarded the second prize, the company's silver medal, for a collection of seven antique fans,—French, Maltese, and Chinese,—most elegantly fitted. Mrs. Cooper was commended for her collection of five antique fans, including Italian and Chinese specimens. The work of judging was entrusted to Mr. John C. Jackson, M.A., F.R.A.S., and Mr. Clem. Lambert. The exhibition will continue open until Saturday, October 28th.

Railway Servants' Congress and Exhibition at Darlington.—On Tuesday in last week an exhibition of models of improved railway wagon couplings and other railway apparatus was opened in the Volunteer Drill Hall, Darlington, and almost immediately afterwards the annual sittings of the representatives of the Amalgamated Society of Railway Servants, over whom Mr. Macliver, M.P., presided, commenced in the Mechanics' Institute, in the same town. The object of the exhibition was not pecuniary gain. All that the committee desired in this respect was to realise a sufficient sum to meet the expenses incurred in carrying out their work. The primary object the promoters had in view was to assist in insuring a greater degree of personal safety for workmen engaged in the dangerous vocation of manipulating railway traffic. The special feature of the exhibition was the large display of models of couplings used for connecting vehicles. The reason given by the committee for making couplings of new and improved design their speciality, is that those now in use entail serious risk to the men who manipulate them, and it is stated that "they are of primitive design, and almost the only appliances connected with active railway work which have escaped improvement tending to facilitate work and at the same time to promote safety." Comparatively few railway men are regularly engaged in the operation of coupling and uncoupling railway vehicles, but, notwithstanding this fact, during the five years ending with 1880 no fewer than 206 men were reported to the Board of Trade to have been killed, and 1,614 more or less seriously injured while engaged in these operations. To accomplish their work the men thus employed have to get in between the vehicles, and the society, in seeking to do away with this risk, needs no justification.

Brownhills Water Supply.—At the meeting of the Brownhills Local Board on the 4th inst., a letter was received from the Local Government Board with regard to the water-supply, stating that a very great many of the wells in the district are contaminated with sewage matter, and that a pressing necessity exists for a pure and abundant supply of water. The letter pointed out that it is clearly the duty of the Urban Sanitary Authority to take immediate steps for providing the district with a sufficient and wholesome water supply. A discussion ensued, and eventually the Clerk was instructed to write to the Local Government Board stating that the Local Board were having the waters from the wells analysed, and were calling upon the property-owners to have their properties adequately supplied, being resolved, in default, to take proceedings to have the [illegible] closed.

Profits of Parochial "Dusting."—At the meeting of the Mile End Old Town Vestry on the 4th inst., the Dusting and Cleansing Committee reported that they had for some time past been considering whether, if an eligible site could be obtained, it would be advantageous to the ratepayers for the Vestry, by their own workpeople, to sort the dust and rubbish collected by the Vestry's carts, and to make it into a merchantable commodity. Mr. Cushen, as chairman of the Committee, negotiated with the Great Eastern Railway authorities, and obtained a site at the Devonshire-street Depôt. He said the Vestry were recommended to adopt the proposed plan, and to authorise all the necessary steps to carry out the scheme. What the committee designed now was to undertake the sorting and sale of the refuse for the ratepayers' profit. Estimating,—as there was good reason to do,—the profit at 1s. a load, the amount obtained for the 16,000 loads removed from the parish per annum would be something like 800*l.*, and other sources of revenue which would follow would, it was hoped, bring them in as much as 1,000*l.* a year, instead of letting it go to a middleman. The recommendations were unanimously adopted.

A City Tavern.—The great fire which more than a year ago consumed Messrs. Foster & Co.'s and other neighbouring premises in Cheapside did considerable damage to the Bull's Head Tavern, Bread-street. It was deemed advisable, instead of merely restoring the building to its former condition, to rebuild entirely, and plans for the new building were prepared by Mr. B. Tabberer, architect, Coleman-street, and tenders invited. Mr. R. Conder proved the successful competitor, and at once proceeded with the work. The premises have been reopened for business. They are four stories in height above the street, and have a basement and sub-basement. The front elevation, which is of Corsehill and sandstone, on the ground-floor, and Chilmark stone above, is of Italian character, with large window-openings. Mr. Porter of Cullum-street, and Mr. Cohen, of Chiswell-street, have supplied the gas-fittings; and the pewterer's work has been done by Mr. South, of George-street, Blackfriars-road.

A Brighton Concert Hall Burned Down.—Late on Saturday night last the West-street Concert Hall, Brighton, was discovered to be on fire. Despite the efforts of the firemen, the flames spread to an adjoining hotel, five stories in height, which, together with the concert-hall, was gutted. Another hotel on the other side of the hall escaped, but it was not until four o'clock on Sunday morning that the fire was got under. Hamilton's panorama had been shown in the building on Saturday night. The fire broke out some time after the audience had left. The damage is estimated at about 50,000*l.* The hall was built some fifteen years ago. The entertainment on the night of the disaster concluded with a mimic representation of the bombardment of Alexandria, and it is conjectured that a spark from the fireworks must have lodged on some of the canvas and smouldered unobserved.

Fall of an Iron Curtain in a Berlin Theatre.—A few minutes after the doors of the Royal Opera House, Berlin, were opened on the evening of the 4th inst., an accident occurred which produced an intense panic, the house being already crowded. Since the catastrophe at the Ring Theatre, Vienna, the stage of the Opera House has been divided from the auditorium by a new iron curtain. Suddenly the whole of this arrangement fell with a fearful crash amongst the footlights. The audience at once rushed to the doors, panic-stricken, and in a few minutes the house was cleared. Although a good many people were severely crushed there was fortunately no life lost. The cause of the accident, it was afterwards ascertained, was the snapping of the chain by which the iron curtain was elevated and suspended.

Provincial Theatres.—Mr. Edward Francis has written an alarming letter to a theatrical contemporary. He speaks of provincial theatres as eminently unsafe, and says that not until a great fire has occurred, "as one soon will," and many lives have been lost, will the authorities awake to a sense of duty. One of the leading provincial journals contends that this sweeping condemnation of provincial theatres is undeserved, and that in Manchester, Liverpool, Leeds, and other large centres of population, the theatres will compare favourably with the best of such structures in London.

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The Sanitary Exhibition at Newcastle-on-Tyne.—This exhibition, of which we have already given some particulars, remains open until the 21st inst. The judges (Professor Corfield, Mr. W. Eassie, C.E., F.L.S., F.G.S., Mr. Rogers Field, B.A., C.E., and Mr. Wallace Peggs) have issued their report, in which they award prizes and certificates. For the first time for four years, the Richardson gold medal, for "an exhibit of pre-eminent merit," is awarded, the exhibitors who receive it being Messrs. Mather & Armstrong, of Newcastle-on-Tyne, for their exhibit of a Siemens regenerative gas-burner, which is stated to save 50 per cent. of gas. Medals were also awarded to Messrs. Hayward Tyler & Co., of London, for "full-flush" valveless closet; to Mr. C. D. Ward, of London, for a household closet; to the British Sanitary Company, Glasgow, for a dry earth closet; to Messrs. Wilkinson & Co., Newcastle-on-Tyne, for damp-proof concrete pavement; the French Health Society, for an exhibit of books on hygiene; Messrs. Manlove, Alliott, Fryer, & Co., Nottingham, for appliances which destroy or convert garbage, house refuse, and contents of ash-pits into charcoal; Messrs. T. Bradford & Co., for washing machines; Mr. J. Scott, of Oldham, for mercury gas governor; the Wilson Engineering Company, for improved Wilson range; and Mr. A. J. A. G. Ross, Newcastle-on-Tyne, for patent silicate cotton wool. There were also many articles certificated.

The New Central Fish Market, Farringdon-road.—This building (recently erected as a fruit and flower market in *lieu* of the dirty and forlorn Farringdon Market) having, by an Act of Parliament obtained by the Corporation, been set apart for the purposes of a fish-market, the necessary works to fit it for its altered uses are in progress. The paving of the area is complete, the gates and gullies to enclose the market and interior shops are in hand, and all other arrangements are being pushed forward so as to open the market at the earliest possible period The City architect (Mr. Horace Jones) is in communication with the railway authorities in reference to the utilisation of the basement for market purposes. The buildings comprise a market area surrounded by shops, the whole being enclosed by iron gates at the various entrances, while externally, and with access from the public roads, there are shops surrounding the market.

National Portrait Gallery.—A complete re-arrangement of the pictures and sculpture in the National Portrait Gallery has been resolved on, and will be commenced forthwith. The portraits formerly in the British Museum and Hall of Serjeants' Inn will no longer be kept apart, but incorporated chronologically in the general series. Every picture will have, according to rule, a distinct statement on the frame of the donor's name. It is not intended to close the whole of the gallery during the alterations, but one portion or another will always be open to the public.

Glazing. — Messrs. William Edgcumbe Rendle & Co., of Westminster, have been selected by the Directors of the Great Northern Railway Company of Ireland to glaze their new terminal passenger station in Amiens-street, Dublin, on the "Acme" system of glass roofing. We are informed that the company have used Rendle's method of glazing solely for the last three years on their new stations and goods sheds.

TENDERS

For additions and alterations to Gatti's Music-hall, Westminster Bridge-road. Mr. Albert Jno. Bolton, architect:—

Holliday & Greenwood	£4,777 0 0
MacFarlane Bros.	4,720 0 0
G. S. S. Williams & Son	4,677 0 0
Nightingale	4,567 0 0
W. T. Hook	4,360 0 0
Niblett	4,355 0 0
Richens & Mount	4,329 0 0
Geo. Gaisford	4,296 0 0

For re-building the Sir John Falstaff, Catherine-street, Strand, for Mr. Elvin. Mr. Ernest Shum, architect, 14, Great James-street. Quantities by Mr. J. G. Raynes:—

J. H. Maxfield	£1,419 0 0
W. & H. Salmon	1,129 0 0
F. & F. J. Wood	1,083 0 0
Langmead & Way	1,040 0 0

For alterations and additions to stable buildings for fifty horses in Barnard's-mews, Little Guildford-street, Bloomsbury, for Messrs. Smith & King. Mr. Frank Goldring, architect, 32, Theobald's-road, Bedford-row:—

Surridge	£483 0 0
Roberts	470 0 0
Conway	437 10 0
Aldridge & Jenvey	**334 12 0**

For the erection of a new theatre, to be called the Grand, on the site of the old Philharmonic, Islington, exclusive of decorations, upholstery, &c., for Mr. Charles Head. Mr. Frank Matcham, architect, Rugby-chambers, Bedford-row. Quantities by Mr. Frederick Thomson:—

Corrected List.

J. H. Brass	£12,300 0 0
E. Lawrance	12,200 0 0
Colls & Sons	11,900 0 0
W. Bangs & Co.	11,860 0 0
Dove Bros.	11,775 0 0
G. S. Williams & Son	11,692 0 0
Longmire & Burge	11,135 0 0
McCormick & Sons	10,755 0 0
W. Shurmur	10,548 0 0
Chas. Wall	9,956 0 0
Wall Bros.	9,874 0 0
E. Toms (accepted)	9,719 0 0

For the erection of new premises, near Coventry-street, Haymarket, for Messrs. Salomon & Simmons. Mr. H. H. Collins, architect:—

McLachlan	£22,100 0 0
Bywaters	21,945 0 0
Tongue	21,321 0 0
Kirk & Randall	21,230 0 0
Adamson	21,049 0 0
Killby	20,987 0 0
Croaker	20,940 0 0
R. Conder	20,850 0 0
David King & Son	20,810 0 0
Morter	20,606 0 0
Downs	20,440 0 0
Brass	20,093 0 0

For the erection of tramway stables, car-sheds, &c., for the South Shields Corporation. Mr. Matthew Hall, borough engineer. Quantities by Mr. Geo. Connell, Moseley-street, Newcastle-on-Tyne:—

Holliday & Christie, South Shields	£4,870 19 0
Hurst, Sunderland	4,861 17 0
Broomhead & Keswick, Newcastle	4,770 0 0
C. Jackson, Newcastle	4,720 0 0
G. Leighton, North Shields	4,693 6 0
D. Lawes & Co., South Shields	4,684 12 8
Middlemas Bros., Newcastle	4,647 19 0
John Moore, South Shields	4,600 0 0
F. Mackey, South Shields	4,597 0 0
J. Elliott, North Shields	4,455 0 0
J. Storar, Jarrow	4,373 0 0
R. Atkin, South Shields	4,436 0 0
A. Thompson, Gateshead	4,365 11 2
Jos. Miller, South Shields	4,295 17 7
D. Kennedy & Son, Jarrow	4,280 0 0
R. Allison, Whitburn (accepted)	3,964 0 0

For works at Undercliffe Wharf, Maidstone, for Messrs. Henry Wright & Son. Messrs. Ruck, Son, & Smith, architects. Quantities supplied:—

Thos. Barden, Maidstone	£1,819 0 0
Garlick, Birmingham	1,707 0 0
White & Joy, Maidstone	1,698 7 0
Cox Bros., Maidstone	1,645 0 0
J. G. Naylar & Son, Rochester	1,640 0 0
R. Avard, Maidstone	1,631 0 0
Wallis & Clements, Maidstone*	1,553 0 0

* Accepted.

For alterations and additions to No. 453, Bethnal-green-road, for Mr. Joseph Smith. Mr. Joseph Harris, architect:—

Staines & Son	£1,444 0 0
Forrest	1,287 0 0
Thomerson & Son	1,225 0 0
Russell	1,221 0 0
Johnson	1,190 0 0
Young & Son	1,100 0 0
Parrish & Hawker (accepted)	1,090 0 0

For alterations and additions to the Two Brewers, Pentonville, for Mr. E. Richens:—

Parrish & Hawker (accepted).

For re-building Nos. 67 & 69, Newington Butts, for Mr. Thompson. Mr. Banister Fletcher, architect:—

Eldridge & Gee	£1,480 0 0
W. H. Castle	1,319 0 0
J. Taylor	1,215 0 0
H. Burman (accepted)	1,159 0 0

For High-street (Rectory) Improvements, for the Beckenham Local Board. Mr. G. B. Carlton, surveyor to the Board:—

Contract No. 1.

F. D. Carter & Son, Westminster	£1,846 1 6
W. Crockett, Camden Town	1,630 19 3
W. Carter, Anerley	1,356 19 11
H. T. Pollard, Bromley	1,353 14 9
T. Bentley, Chislehurst	1,343 2 8
Mowlem, Burt & Co., Westminster	1,341 18 6
Nowell & Robson, Kensington	1,319 0 4
Marshall, Brighton	1,177 7 6
Woodham & Fry, Lewisham	1,145 0 0

For effluent water sewers, Ealing and Brentford Drainage. Mr. Chas. Jones, engineer to the Ealing Local Board. Messrs. Gotto and Beesley, engineers to the Brentford Local Board:—

Contract No. 1.

W. J. Botterill, Cannon-street	£6,997 0 0 !
Kellett & Bentley, Queen Victoria-street	6,306 0 0
F. Nowell, Shepherd's-bush	5,998 0 0
Jos. Mears, Hammersmith	5,500 0 0
J. Hayward, Eastbourne	5,427 0 0
Nowell & Robson, Kensington	5,376 0 0
J. Strachan, Wood-green	5,150 0 0
J. Ball, Chiswick	5,069 0 0
J. G. B. Marshall, Brighton	5,000 0 0
G. Law, Kidderminster	4,993 0 0
G. G. Rayner, Bootle	4,665 0 0
McKenzie, Williams, & Co., South-place, E.C.	4,380 0 0
J. Dickson, St. Alban's	4,354 0 0
Ford & Everett, Westminster*	3,800 0 0
J. Dooley, Tottenham	3,053 0 0 !

* Accepted.

For verandah, greenhouses, &c., at The Hawthorns, Bromley, Kent. Mr. St. Pierre Harris, architect, 1, Basinghall-street:—

Crossley, Bromley (accepted)	**£354 0 0**

For erection of stabling at Kensal-green, for the London General Omnibus Company, under the superintendence of Mr. Lanham. Quantities by Mr. H. J. Bolton:—

W. T. Hook	£3,688 0 0
Niblett	3,293 0 0
Jackson & Todd	2,815 18 0
J. Crabb	2,720 0 0
E. C. Ford	2,639 0 0
H. D. Evans	2,567 0 0
J. Garrud	2,531 15 0
M. Gentry	2,500 0 0
Richens & Mount	2,497 0 0
E. Bentley	2,480 0 0
Geo. Parker	2,449 0 0
Haynes	2,400 0 0

For alterations and repairs to the New Tabernacle Chapel, Old-street. Mr. William Smith, architect:—

Shurmur	£1,275 0 0
Anley	1,270 0 0
Harper	1,238 0 0
Steele Bros.	1,198 12 0
Mattock	1,153 0 0
Wood	1,095 0 0
Dunford & Langham	1,079 0 0
Larke	1,030 0 0
Stevens Bros. (accepted)	970 0 0

For erection of All Souls' Church, Clapton Park. Mr. F. T. Dollman, architect, 63, Gloucester-crescent, Regent's Park. Quantities by Mr. F. W. Davis, 6, Duke-street, Adelphi:—

W. T. Hook	£6,220 0 0
E. Lawrance	6,145 0 0
Dove Bros.	5,975 0 0
Ashby Bros.	5,348 0 0
B. E. Nightingale	5,341 0 0

For erection of school buildings, Bexley Heath, Kent. Messrs. A. & C. Harston, architects, 15, Leadenhall-street:—

Gumbrell	£2,010 0 0
M. Manley	1,949 0 0
W. & F. Croaker	1,833 0 0
Miles	1,754 0 0
Butler	1,680 0 0
Balaam Bros., Old Kent-road*	1,500 0 0

* Accepted.

For painting and repairs at the Able-Bodies Workhouse, Mary-place, Notting-dale, for the Guardians of Kensington. Messrs. A. & C. Harston, architects:—

A. W. Derby, Limehouse (accepted)	£134 0 0

For pulling down and re-building Feltham Lodge, Feltham, Middlesex, for Mr. Thomas Woodward. Mr. Fred. Nesbitt Kemp, architect. Quantities by Messrs. Maughan & Cuxson:—

Daniels	£5,300 0 0
W. Lodge	5,113 0 0
Haylock	4,685 0 0
Downs	4,294 0 0
W. H. Smith	4,289 0 0
H. Smith	3,989 0 0

For hospital for the Boys' Home, Bisley, for the National Refuges Society. Mr. E. P. Loftus Brock, architect:—

Mattock Bros.	£1,076 0 0
Brass	1,067 12 3
Shears	965 0 0
Brown	960 0 0
Faggetter	944 17 0
Whitburn	866 0 0

For alterations and additions to Nos. 31 & 32, Crown-street, Brighton. Mr. Arthur Loader, architect, Brighton:—

W. Hackman	£687 0 0
G. R. Lockyer	660 0 0
J. M. Newnham, Brighton	620 0 0

For mansion at Henfield, Sussex. Mr. Arthur Loader, architect:—

W. Ward, Henfield (accepted).

For house, New Shoreham, Sussex. Mr. Arthur Loader, architect:—

C. Curd, Shoreham (accepted) £350 0 0

For building high brick ventilating-shafts at outfall chamber and air-inlets to main sewers, for Local Board, New Shoreham, Sussex. Mr. Arthur Loader, surveyor:—

C. Curd, Shoreham (accepted).

For wrought-iron up-casts, ventilating-pipes, for above:—

Burtenshaw, Shoreham (accepted), 5s. 8d. per yard.

For boundary fence-wall and gates to outfall works, for Local Board, New Shoreham, Sussex. Mr. Arthur Loader, surveyor:—

C. Curd, Shoreham (accepted).

For two houses at Worthing, Sussex. Mr. Arthur Loader, architect:—

E. Seaber, Worthing (accepted).

For new wing to the Ship Inn, Southwick, Sussex. Mr. Arthur Loader, architect:—

Redford	£347 10 0
J. Terry	330 0 0
W. Miles	329 5 0
H. J. Peters	314 10 0
T. Peters	296 16 1
C. Curd	276 0 0
J. King, Southwick (accepted)	235 10 0

For erection of six houses at Whitton. Mr. Fredk. Lea, architect, 19, Buckingham-street. Quantities supplied:—

Hickinbotham Bros.	£2,540 0 0
Hiscocks	2,450 0 0
Hughes	2,109 0 0
J. Holloway, Lavender-hill*	2,093 0 0

* Accepted.

For alterations to three shops and sundry repairs. Mr. Fredk. Lea, architect:—

J. Holloway (accepted)	**£474 0 0**

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For the works required in the execution of an additional relief line of sewer on the south side of the Thames, with an outlet into the Thames at Deptford-green, for the Metropolitan Board of Works. Sir Joseph Bazalgette, engineer:—

W. T. Hook	£68,000	0	0
Nowell & Robson	64,000	0	0
W. J. Botterell	45,452	0	0
Nelson & Co.	45,184	0	0
H. Lovett	43,500	0	0
Macreagh & Macfarlane	42,415	0	0
W. Webster	39,932	0	0
Williams, Son, & Wallington	36,370	0	0
Kellett & Bentley	36,000	0	0
J. Mowlem & Co.	35,490	0	0
Pearson & Son (accepted)	33,990	0	0

For rebuilding No. 10, St. Swithin's-lane, E.C. Mr. Wimble, architect:—

Hall, Beddall, & Co.	£7,383	0	0
McLachlan & Sons	7,337	0	0
Ashby & Horner	7,250	0	0
Scrivener & Co.	7,225	0	0
Morter	7,173	0	0
Dove Bros.	7,000	0	0
Laurence	6,890	0	0
Brass	6,823	0	0

For reservoir, engine-house, &c., at Swinton Waterworks, Rotherham:—

H. Brumby, Sheffield	£4,157	0	0
Chadwick & Co., Masborough	4,100	0	0
J. Hill, Sheffield	4,016	19	11
G. Stephenson, Eckington	3,999	13	9
Dobb & Gummer, Rotherham	3,730	0	0
J. Cropper, Brimington	3,276	8	10
B. Wortley, Doncaster	3,012	15	2
H. Burrows, Barnsley	3,004	15	7
G. Pugh, Rawmarsh	2,869	0	0
D. Arundel, Swinton (accepted)	2,753	17	9

For water-mains, valves, hydrants, and laying the same, for the Swinton Waterworks, Rotherham,—

M. Barber, Barlborough	£1,307	18	6
Hutchinson Bros., Barnsley	1,207	17	0
J. Stephenson, Eckington	1,177	15	9
Chadwick & Co., Masborough	1,098	0	0
J. Hill, Sheffield	1,077	17	0
Dobb & Gummer, Rotherham	1,076	16	9
J. Cropper, Brimington	1,010	13	4
F. Boole, Rawmarsh	1,005	10	6
D. Arundel, Swinton (accepted)	975	5	4
Haggard & Son, Mexborough	957	12	2

For additions and alterations to Rathmore Lodge, The Boltons, Fulham-road, for Mr. J. Turnbull. Messrs. William Wallace & Flockhart, architects. Quantities by Mr. Frederick Thomson:—

S. G. Bird	£2,792	0	0
P. S. Robertson	2,683	0	0
W. & E. Curtis	2,660	0	0
E. Toms	2,483	0	0
J. H. Brass	2,460	0	0
C. Wall	2,377	0	0
Dowsing & Sons	2,247	0	0

For taking down mansion known as Medina House, High-street, Witham, Essex, and building three residences on the site:—

W. Balaam, Trinity-street, Borough, London (accepted)	£1,200	0	0

For proposed stabling to No. 5, Seymour-road, Wandsworth. Mr. Joseph S. Hansom, architect, 27, Alfred-place West, South Kensington:—

T. Seward	£685	0	0
F. F. Buchan	635	0	0
F. Reeves	623	5	0
J. Newton	600	0	0
W. Pearson	592	0	0
J. Sutton	550	0	0
J. Tyerman	549	0	0
W. Webber	536	0	0
W. Bullock	530	0	0
R. Jones	526	18	0
Holloway Bros.	526	0	0
Langler & Pinkham	525	0	0
J. Robinson	519	10	0
H. R. Swain	519	0	0
W. H. Lorder	510	0	0
E. H. Maplesdon	497	15	0
F. P. Treweeke	495	0	0
C. Collins	481	0	0
R. M. Rowse	453	10	0
Higgatt & Brown	452	13	6

For new shop-front at 124, High-street, Stoke Newington, for the Incorporated Society of Licensed Victuallers. Mr. H. I. Newton, architect, 27, Great George-street:—

Drew & Cadman	£103	8	0
Walker	96	0	0
Sage	90	0	0
Pickersgill Bros. (accepted)	79	0	0

For alterations and additions to Nos. 49, 51, 53, and 55, Falcon-road, Battersea, for Mr. W. P. Holland. Mr. Harold Giffin, architect:—

Lathey Bros.	£1,197	0	0!
Eberall	1,035	0	0
B. T. Wood	959	0	0
Turtle & Appleton	725	0	0
Hammond	548	10	0!

For pulling down the old Silk Factory, London-road, Newbury, and building on the site seven cottages, with out-buildings, for Mr. Charles Nukey. Mr. J. H. Money, architect, the Broadway, Newbury. Quantities supplied by Messrs. R. L. Curtis & Sons:—

		Old Materials.
S. Elliot	£1,944	£93
Adey	1,885	100
Harrison	1,535	—
E. James	1,262	20

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The Builder.

VOL. XLIII. No. 2072. SATURDAY, OCTOBER 21, 1882.

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Old Buildings and New Decorations.

IT is an obvious fact that many buildings in occupation must require a renewal of their internal decoration much oftener than the building itself requires renewal. There are cases in which the decorations of a building, the main portions of which were completely finished from the first, have never been completed at all, and have still to be carried out when a new interest is imparted to the building from its passing into the hands of a new proprietor, or from any other reason. In such cases is it *de rigueur* to comply with the style of the building itself, whether we admire it or not? Or may we not decorate from our own point of view, and in accordance with our own taste?

The question is sometimes suggested by the sight of a proposed scheme for decorating a building under such circumstances. We have, perhaps, a church which belongs to what we will call the Late Classic period of English architecture, which has been left, as so much of the said Late Classic architecture actually was left, in a very bald and prim state of unadornment. A new incumbent or a new churchwarden desires to raise the building from this pristine state into one of comparative beauty and magnificence, and asks for a scheme of decoration. The purist system is to decorate the building as those who built it would have decorated it. The intending reviver of the glory of the structure will, in that case (supposing still that it is Late Classic), receive a scheme for his consideration embodying among its details many wreaths and festoons, some hanging vertically, some horizontally; ribbons will appear here and there tied in knots and with the ends fluttering away in plaster; puffy little cherubs (so called, of course, because they are in a church, but looking much more like Cupids) will sprawl on various surfaces that may appear open to receive them. If colour is introduced, it will not be such as we, since our partial enlightenment in regard to colour, could approve of; it will be such as is found in decorators' sketch-books of the supposed period, showing strange and awful combinations of pink and green, such as we know to be contrary to all the law and the prophets. Yet these sins will be proposed, because it is known, and we cannot deny it, that the original architects of the building would have done thus if they had done anything.

The case was, occasionally still is, the same when the question is of a Mediæval building, supposed perhaps to have been once coloured, or once meant to be coloured. The unfortunate example of a certain ancient church near Winchester is a conspicuous one, known to most people who have interest in such matters. There are other examples from our cathedrals that might be quoted, in which decoration of a very violent and glaring kind has been introduced, with much raw primary colour, offensive to the delicately-trained eye, but introduced, because certainly the Mediæval decorators would have worked in these strong colours, and perhaps have left faint but readily comprehensible traces of the fact that they did so. Our taste of late years has been trained to dislike masses of primary colour, and at present the prevalent taste is, in fact, towards an over-fondness for weak and often nearly colourless tones; yet if we decorate a Gothic church we are ready, or some of us are, to throw overboard all this certainly more refined (no doubt sometimes over-refined) taste for pale tones, and adopt the taste of the Mediævalists for strong colours.

Now we wish to suggest that when an architect or decorator is called in to design or advise upon the new decoration of an old building, it is not necessarily his part to reproduce something like what the original architects would have done, unless this happen to be in accordance with the best taste in decoration as understood and believed in his own innermost artistic conscience. If the building had altogether decayed, and had to be removed and a new one built, no one would say that it was the architect's duty to build a new one exactly like the old one. On the whole, he would rather be blamed for doing this, as producing a sham. Nor is it any more his duty, if the decoration of the building be decayed, whitewashed over, or non-existent from the first, to produce new decoration which shall be an imitation of the old, or of what it is presumed the old would have been if it had ever been executed. This is as much a sham as the new building.

But is he not bound, it may be replied, to consider the style of the building, and harmonise his decoration with it? Yes, in a sense, undoubtedly; but not necessarily in the precise manner in which the original artists would have done it. That is not harmonising; that is merely mimicry, and may often involve the throwing away of an excellent opportunity to improve an old building and to set up a new standard of taste, or the commencement of one. It is surely a very poor course for a modern designer to take, to say practically, "The people who erected this building knew nothing of colour, and had very vulgar ideas about the *motifs* and the execution of decoration, and therefore in decorating their building I will reproduce all their deficiencies and vulgarities faithfully." What we should rather endeavour to do should be to devise a scheme of decoration which, while avoiding the errors and shortcomings of the style of the original building, should yet harmonise with its general lines and with the general purport and feeling of its architecture. To attempt to decorate in that spirit would render the task worthy of being called an intellectual one, which the mere correct reproduction of a bad or vulgar style certainly is not. It would be a matter of serious interest to devise a style which should retain sufficient suggestions and reminiscences of the kind of decoration originally belonging to the architectural date of the building, and which at the same time should show that the modern decorator is not in the trammels of his perhaps less cultivated predecessors. His decorative scheme should seem in itself to say to the spectator, "We know how the original architects would have done this, but we also know better than to fall into all their weaknesses and vulgarities of style."

These few remarks, partly suggested by a certain design, never mind where, in which all the weaknesses and tawdrinesses of the Wren school of ornament, with Cupids, ribbons, and what not, have been deliberately reproduced for the edification of the present generation, out of an over-acted desire for "harmony," fortunately seem about to receive illustration in the opposite direction by what is being designed for the decoration of St. Paul's Cathedral. In that scheme there certainly seems to be the attempt to produce something which shall be sufficiently in relation to the architectural style of the building, and sufficiently suggestive of what would have been Wren's decorative idea if he had ever had it carried out, while avoiding any of the more prominent faults of the Wren school of detail and of ornament, and suggesting something much superior, in fact, to what would have occurred to him or his contemporary artists. And fortunate indeed it is that this is so, and that no misguided attempt has been made to produce exactly what would have been done in Wren's day had the funds for decoration on a large scale been forthcoming at that time. The mere idea of St. Paul's Cathedral so bedizened as it would have been with Cupids and clouds and ribbon-knots, ought to be sufficient to convert even the most ardent adherents of "truthfulness" in such matters, and certainly suggests a powerful, even a formidable, illustration of our present observations.

Public Works in India.—Strong statements as regards the evil of the system under which public buildings are erected in India are being published. We have before now pointed this out at some length.

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THE WEST FRONT OF RHEIMS CATHEDRAL.

"The west front of Rheims Cathedral," says M. Viollet-le-Duc, "is one of the most splendid conceptions of the thirteenth century." As such, no one who has the smallest interest, whether as a professional or an amateur of art, should fail to visit it. But if there is one absurdity more common in these days than another it is for persons to stare for two or three hours at a building such as Rheims Cathedral, which it is impossible to appreciate without some thoughtful and careful observation. We should hope that all architectural students who may visit this, or indeed any other European, cathedral will never give way to this "return-ticket fashion," if we may so say of seeing notable works of art. Those who do so, whether they be students of architecture or ordinary tourists who go to work in this hasty manner, are simply throwing away their money. Of course, numbers of the latter, at any rate, daily do so, but the actual pleasure obtained by merely seeing a new sight may in their case seem to them a sufficient recompense. But it cannot be one to the visitor with more serious motives. We have no intention of writing a description of the splendid pile so historically interesting also as the crowning place of the kings of France. The architectural student has no need to go beyond several well-known and standard works for a careful account of this splendid church. It may be useful, however, if we make mention of a local handbook to this building of a much higher class than is usually the case with works of this kind. It is entitled "Description Historique et Archéologique de Notre Dame de Reims. Par M. l'Abbé V. Tourneur, Vicaire-Général de S. E. Monseigneur l'Archevêque de Reims, &c. 4me. édition. Reims: E. Deligne, Libraire de l'Académie. 1880." It is, in truth, a much more thorough work than its author's modest preface would lead one who had not perused it to suppose. It may be asked, if we are not going to describe Rheims Cathedral, what, then, have we to say about it? Our answer is, that the west front cannot be studied without two very important conclusions being formed in the observer's mind, one of which, at any rate, is both interesting and important in regard, not only to the study of architecture historically, but to the practice of it as a profession. These two points, if we may so term them, are, firstly, that this west front shows at once the limits beyond which elaborate sculpture, as an architectural adornment, is more or less useless, and those within which it is not only a real addition to the architectural beauty of an edifice, but also valuable for its own sake as sculpture; secondly, in no building is there more discernible the loving study bestowed on large portions of Mediæval work, the way in which the whole design is governed by one central idea, and the skill and purity of Mediæval sculpture, as well as its unequal character.

The correctness of these positions when once formulated can be easily judged of by any one who visits Rheims; it is difficult, on the other hand, for any one who has not before his eyes the elaborate details of the great west front either to agree with or to dispute them. Take, however, the flat portion above the arch which, in its turn, surmounts one of the chief glories of Notre Dame at Rheims, the large rose-window, full of glass of the mellowest and most harmonious colours. This flat space forms the background for sculpture which, on the right, shows David casting the stone at Goliath of Gath; in the left, the future king of Israel with outstretched arms about to sever the head from the body of the giant. Trees, sheep, and dogs are the accessories of the main part of the sculpture, and the whole forms a very elaborate graven incident of Holy Writ. But the careful work is more or less thrown away, the distance of the picture, as we may be allowed to term it, from the spectator prevents the figures from having greater importance in the design of the whole front than the finials, for instance, which surmount the pinnacles on either side of this scene, and a somewhat larger and more elaborate arch to have filled up most of the space occupied by this sculpture would probably have been more architecturally effective. Again, too, the careful workmanship of the smaller statues which fill the gable of the doorway is to a great extent labour in vain. The converging lines for the sake of architectural effect necessarily cause the figures to be in various degrees away from the perpendicular. There are, in fact, no less than seventy-five statues to bring before us the saints of heaven, who may be said to prepare the mind of the worshipper as he enters to observe with due reverence the Coronation of the Virgin, which in large sculpture in the round fills the extreme angle of the arch. On the other hand, let us take as instances of the effective use of statuary as showing the limits within which it adds to the beauty of an edifice, and can be, for its own sake, appreciated,—the large figures which guard the three doorways. For example, the centre doorway is double, and is divided by a statue of the crowned Virgin, who stands, so to say, on a pedestal some 4 ft. from the ground, and consequently watches, as it were, the worshippers who enter the church which is dedicated to her. Nothing could be more effective, and in no way could sculpture be more properly utilised. It is impossible to enter without every fold of the dress, every feature of the face, being seen. The same may be said of the four statues on either side of the double doorway, past whom any one who would enter the church must go. They lead up to the central figure of the Virgin, and they depict, on the one side, the Annunciation and Visitation; on the other, the Purification; and let it be borne in mind that the open space in front of a great cathedral was a spot much thronged in bygone days, and then it will be obvious that the use of sculpture in such a way as this would doubtless have a powerful effect on the minds of the uncritical people who thronged the portals of the church. But even for secular purposes groups of sculpture adequately treated and used in this manner cannot fail to be effective. Many of our readers can call to mind the sides of London University which face to Burlington-gardens, or of the Glyptothek at Munich, both of which have statues of great men placed at certain distances along the wall, duly "labelled" with the names of those whom they are intended to represent. Architecturally this arrangement is quite ineffective: the statues do not at all enter into any design, and the monotonous array is far from beautiful. Neither have they the finish and the life-like character of really good works in marble, so that, to some extent, it is degrading sculpture to use it in such a manner. The most ridiculous instance, however, of this which we can call to mind are the figures on the new Knightsbridge barracks of cavalry soldiers of the olden time, in costumes which are much better left alone in old prints, and which certainly should not be perpetuated in stone in the most crowded drive in the world.

It may almost be gathered from what has already been said, how immense a quantity of reverent thought must have been bestowed, extending over a number of years, upon this front, and how carefully and clearly the main object was kept in view, namely, to honour the Virgin and to make her story stand out conspicuously. What we would, however, more particularly point out is the manner in which the Rheims sculpture exemplifies the sculpture of the Middle Ages. We need go no further than the chief doorway for this purpose. The figure of the Virgin in the visitation is full of womanly dignity. Technically the garments are draped in admirable lines, but it is more especially the quiet dignity, not only of the features, but of the whole figure, which renders this statue noticeable as showing the excellence to which some Mediæval sculptors attained. Many, too, of the smaller figures about this porch, such as those fragments which depict Adam and Eve in Paradise, show a remarkable amount of technical skill. On the other hand, the figure of the Virgin who stands between the two doorways is, as regards the face, quite wanting in all the finer attributes which distinguish the secondary figure. Her features are disfigured by a silly and an affected simper; the statue which should be most impressive accordingly loses most of its effect upon an educated observer. Here, therefore, we have visible, without moving a step, examples showing what we have already mentioned,—that is, the skill and purity of Mediæval sculpture and its unequal character. If the main statue had been like that on the right hand of the entrance, it would have been even more impressive than the womanly figure which we so much admire. In the same way the nude and almost grotesque statues in the right portal, depicting, it has been supposed, some of the chief persons of the Old Testament, are in strong contrast with many of the dignified and lifelike figures which are so numerous in this west front. We might have fortified our positions with more detailed descriptions, and more elaborate arguments; but we desired rather to suggest these points to any one who might be about, either professionally or as an amateur, to study Rheims Cathedral, or who might in these recent summer and autumn days have visited this splendid church. Possibly there may be some who will not agree with these views; but they appear to us to be logical conclusions from a careful observation of this west front. And the other portions of the building,—the mass of sculpture, for example, in the interior above the main west door,—would, we are sure, serve further to uphold these views. But whatever opinion may be held, nothing can diminish the value of the west front of Rheims Cathedral to those who prize architectural and artistic masterpieces.

CONTINENTAL GATHERINGS.

In spite of the large governmental and private encouragement which French art yearly receives, it seems to some critics that French art is not in a very hopeful condition, and this view comes not alone from outside. Only within a few weeks past the late Henri Lehmann founded, by his will, an annual prize to be awarded to the author of the work which, by choice of subject,—composition, style, and execution,—shall be deemed to have indicated most strongly a protest against the decline of classic art, the exact opposite of which, the realistic tendency now in favour, M. Lehmann desired by this means in some measure to counteract. There might, at first sight, perhaps, appear to be no very great ground for deeply-expressed grief on our part as outsiders at a possible period of calamity overtaking our French artistic brethren. There is, however, another side to the question. France still remains, it cannot be denied, the great arbiter in art-matters; even were its powers to fail, it would still continue to retain its influence, for no other country is in a position to take upon itself such a heritage. Italy, Spain, Germany, Holland, Belgium, in spite of all their artistic talent, would be unequal to the task. Recently discussing this somewhat problematical subject, our New York contemporary, the *Critic*, has not hesitated to assert that the future possession of the artistic sceptre "lies more in the way of Great Britain or the United States. It cannot be denied now, however, although a few years ago those who had the nerve to prophesy in that direction were promptly laughed down, that the chances of supremacy in the fine arts are noticeably tending towards America. If the Parisian critics are alarmed at the excellence of the second-rate young painters of American pictures whom Paris and Munich have educated, they would be more alarmed could they know that the United States have other more original, more thoughtful, and more modest artists in reserve whose peculiar qualities will not soon be appreciated by Europeans, but of whose future eminence there can be no doubt." There is one view of this threatened downfall of French art, which is far from encouraging, however pleasing may seem the prospect of the lead being taken in this direction, either by us or by our American kinsmen. And this view may be said more particularly to regard American artists than ourselves. Paris, for many generations, has been their great artistic school, and of late years even more so than in the days when young Americans were to be found scattered about at Düsseldorf, at Weimar, and at Munich. Paris has of late carried off the palm as the art-teacher of the rising American painters, in spite of the fascinations of the modern Italian schools of Milan and Florence. That the chief source, therefore, of American art-study, and indeed for the matter of that, of the study of a number of young artists of almost every country should be corrupted, is a serious outlook. Parisian art-teaching, as it stands at present, has spoiled more than one clever young artist, not alone American, it may be observed. Be this as it may, whatever are the faults of French art, we are sadly afraid that we, however much our cousins may feel inclined to take upon themselves the inheritance, are scarcely in the position to set up our school as a model to the world. Our neighbours having taken from Italy three centuries ago the lead in artistic matters,

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have wisely adopted measures to ensure the continuance.

An insight into the nature of these means is afforded by the announcement of the recent enlargement of the national Conservatoire des Arts et Métiers,—an admirable institution, a counterpart to which, though we are essentially a practical nation, is almost absolutely wanting in this country. It is, it may be observed, one of those numerous educational institutions which the French wisely throw freely open to the public on the Sunday afternoon. The Conservatoire des Arts et Métiers is justly credited with possessing probably the most extensive collection of industrial and scientific objects in existence. The lectures, open freely to all comers, and embracing the most comprehensive elements of artistic and industrial education, from chemistry and natural history to mechanics, weaving, printing, and political economy, are delivered by the most eminent French professors, while each year the collections are carefully enriched with models and specimens of the latest advances in art and industry. Intended, in fact, to spread among the dependent classes popular and thoroughly practical notions of industrial education, the Conservatoire des Arts et Métiers merits, it can be understood, no small meed of praise for its share in the modern artistic and commercial supremacy of France. It would be difficult to find any branch of industry, either purely scientific or connected with the arts, not adequately represented in this admirable institution, and not alone by modern models, but by, in many cases, historical objects. It would require somewhat more than the limits of a paragraph to describe, even hastily, the contents of the Paris Conservatoire des Arts et Métiers, a building in itself of no small antiquarian interest, established as it is in the Gothic priory of St. Martin des Champs, of which there still remain many beautiful details. It is one of the sights which no traveller should fail to see, a Sunday afternoon at the Conservatoire des Arts et Métiers, when the models are in motion, and, amidst the crowd of visitors, the more practical listen to the explanation of the good-natured keeper in charge of the various machines. The recent increase of the already large building by the addition of two wings, is a proof of the value which the Government rightly attach to the instructive value of the Conservatoire, one of the characteristic, but not sufficiently well-enough known, Government institutions of France.

This interference, as we should call it, of the State in all such institutions is, of course, peculiar to France, where, it must be remembered, incomes being much more equally distributed than with us, and where the comfort of the family depends far more on the labours of its head than as with us on accumulated riches, the aid of the State is almost everywhere necessary. The immense wealth of so many of our great families is, fortunately for us, not unfrequently exercised with the utmost intelligence and with a not ungenerous desire to satisfy the needs generally of the community, as also is the case in America, where it is no rare matter to meet with millionaires scattered over the whole country. France, however, does not belong to a limited landed aristocracy,—there are, if we mistake not, hard on 20,000,000 of landowners in France,—while, active as is its industry, it cannot be said to offer so extended a field for enterprise as the great continent of America. It can be understood, therefore, that, when a special Minister of Agriculture was appointed not so long since in a country where agricultural products are one of the chief sources of wealth, the promise of the institution of a regular system of State insurance against the possibility of loss by inundation, frost, &c., has been hailed with delight. The Chambers have annually to vote large sums to indemnify the farmers for such accidents. The amount of damage which is yearly worked among the crops and vineyards by the weather, by hail and frost, is no small matter. Hailstorms will ravage in a few hours a fourth of the country. The injury worked is variable, but always considerable. Damage to the extent of over ninety-one millions of francs (hard on four millions sterling) was the result of hail alone in 1876. A frost has been known to inflict a loss of over three millions sterling on the country; a recent authority has estimated the mean annual loss at about 350 millions of francs, or about fourteen millions sterling. In cases of this kind, where no system of insurance exists and the small capitalist is ruined, the aid of the State, it is urged, can be most efficiently introduced. By the formation of a Government insurance company, with no exacting shareholders to satisfy, and no dividends to declare, the premiums will be naturally small. Loss, while it will diminish the general public fortune, will not totally ruin the small capitalist. Taxes will be necessarily lightened, as the Chamber has annually to vote large compensations to the unfortunate farmers. At a moment when, in our country, the land question is being daily agitated, and the proposal has gone forth to appoint a special Minister of Agriculture, such a scheme as this of our neighbours is worthy attention.

What may be done by enterprise towards reclaiming from the effects of nature whole tracts of rich land, has been shown the world by Holland. The old traditions are worthily kept up there. The work of reclaiming the southern portion of the Zuyder Zee may be said to be almost terminated. On the limits of the reclaimed land a huge cement-cased reservoir is now being dug in the sand. This reservoir,—some 25 miles long,—will be about 6 ft. above the highest tide of the Zuyder Zee; the work, it is estimated, will occupy seven to ten years.

In the excavations necessary for this immense undertaking we have not heard of any archæological discoveries having been made; the ground is not so fertile in possible finds as Mexico would appear to have proved to M. Charnay, who has lately sent home a most glowing account of his recent discoveries in Central America. M. Charnay, it may be remembered, we announced some time since, had been specially despatched to the New World to explore the peninsula of Yucatan and those phantom cities which, half a century ago, Stephens described so graphically. Leaving Tabasco, M. Charnay organised an expedition to Frontera, went up the Oucon Macinta to a point where his further advance by water was arrested by the floating mahogany set adrift by the lumber-men, but continued his movement eastwards by means of a caravan, and before long, on a strip of land claimed by Guatemala, M. Charnay had the joy of discovering a series of ruins covering a space of over a mile in length. The monuments are in the style of those at Palenquè. Unfortunately here, as there, the decorations being in stucco, most of the bas-reliefs are in terrible condition, only five having remained intact. From the *Courrier des États-Unis* we learn that the casts of these are already on their way to Paris. In the decoration, the cruciform symbol has been found, but in no way resembling the Christian cross, but rather the Bouddhic; the possible connexion between the art of Central America and that of Java has, it may be remembered, been pointed out in these pages. M. Charnay saw also a number of vases which served for the religious sacrifices that half a century ago the people still offered up on this sacred spot, a fact which brings us to a period much nearer than was at first believed. The ruins of Yucatan must, in fact, be considered as the ruins of quite modern monuments. Out of gratitude to Mr. Lorillard, of New York, who so generously assisted the expedition, the ruins discovered have received the name of "Lorillard City." M. Charnay is now in Mexico, where he has been busily obtaining casts of the principal monuments in the museum of that city, with a view to enriching the Paris Museum of the Trocadéro with some interesting specimens of the native art of the New World.

Each year, as we have more than once explained, the French Government devotes a very generous sum to the restoration and maintenance of its historic monuments. This sum, on an average about 60,000*l.*, is applied to a certain number of works, which, as they are completed, are replaced by others on the list. The programme for 1883 of the Commission which is entrusted with the supervision of the historic monuments has just been published, and the list, filling half a column in small type of the *Journal des Débats*, embraces the whole country from the Ardennes in the north to Vienne in the south, the château de Coucy, the cathedral of Laon, the ramparts of Carcassonne, the amphitheatre of Arles, the cathedral of Lisieux, the château of Blois, the château of Pierrefonds, the Cluny Museum, the Abbey of St. Denis, the chapel of the château of Vincennes, the Tour de Montléry, the antique theatre of Orange, being the more familiar features mentioned amidst a crowd of most interesting architectural monuments. A large number of new works is projected, together with the restoration and maintenance of a number of mosques and Roman monuments in Algeria, and megalithic remains scattered over Brittany.

THE JARDIN DES PLANTES.

We have recently given, in these pages, a view of the new Zoological Museum erected in the Jardin des Plantes at Paris.* As in the case of our own Natural History Museum,—as, indeed, in that of all the great national collections of the present day, the necessity for an extension of premises is continually making itself felt. Although the large new Natural History Museum in Cromwell-road has allowed the British Museum authorities somewhat more room for the disposal of their collections, and only a few days ago the first stone was laid of a new wing to accommodate the Print Department, yet still the Great Russell-street institution will be far from sufficiently supplied with space to display its yearly increasing treasures.

It is the same with the venerable Jardin des Plantes, which, from the humblest commencement, has conquered a foremost place among the scientific institutions of the world. It has long been one of the most characteristic features of the French capital, and in the midst of the modern improvements which are sweeping away in every direction the Paris of the past, the Jardin des Plantes still retains in its aspect something of the air of the century in which it was founded. Its importance as a scientific institution may be judged when it is stated that, in itself, it in reality combines all the features of our Zoological Gardens, our Natural History Museum, our Kew, our Botanical and Horticultural Gardens, the Museum of Economic Geology, our College of Surgeons, and, in a manner, our London University and King's College.

Officially known as the "Museum of Natural History," it numbers among the professors who compose its staff and deliver the nineteen different courses of gratuitous public lectures, the most distinguished *savants* of France. Its past history is no less connected with names, many the most revered in the progress of modern science; the memory of the learned Buffon, of the gentle Bernardin de Saint Pierre, the author of "Paul and Virginia"; and of that master-mind, Cuvier, the Owen of France,—all directors of the Museum, suffice to give something more than an ordinary interest to the Jardin des Plantes.

Far from the bustle and roar of Paris, in a remote corner of the busy metropolis,—the finest view of the cathedral of Notre Dame, with its delicate flying buttresses, is to be obtained on the way to the Jardin,—the garden, with its prettily-broken ground, its menagerie, its hot-houses, its scattered galleries, its clumps of old trees, its avenues and beds of flowers, is a sight which no visitor to Paris should fail to see. The air of the seventeenth century, when the garden was first organised, seems to linger about the spot. Originally intended by its founder, Guy de la Brosse, as a garden like our own Botanic Garden of Simples at Chelsea,—which Evelyn mentions having visited in 1685, August 7,—for the cultivation of medicinal herbs, Louis XIII. in 1626 gave his protection to the undertaking of his doctor in ordinary. From this simple commencement, and on some broken ground belonging to the convent of St. Victor which the garden occupies,—to the existence of which it owes not a small portion of its present charm,—grew the existing Museum of Natural History. A school of botany, chemistry, natural history, and astronomy was founded, and when, in 1641, Guy de la Brosse catalogued his collection, it was found to contain 2,360 specimens of plants.

Under the beneficent rule of Colbert,—whose Scottish origin we should never forget,—the Jardin des Plantes was essentially one of those national institutions such as the great Minister of Louis Quatorze loved to encourage. In 1700 Tournefort, whose bust appropriately figures on the façade of the new museum, travelled for the Jardin, in the Levant, with Aubriet the painter. In 1708 two hot-houses were built, and the brothers Jussieu brought home from the furthest corners of Europe and Asia fresh rarities to enrich the collection. The sturdy old cedar-tree, the first brought to

* See pp. 492, 503, *ante*.

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Europe, which still rears its now diminished head,—snapped off by lightning some years ago,—was planted as far back as 1738. In the botanic garden at Chelsea, the solitary cedar which remains still standing, picturesquely breaking from the river the long line of the Embankment, was planted fifty years earlier (1683).

With the year 1739 Buffon, of memory ever fresh to young and old alike, became director of the Jardin des Plantes. A fresh impulse was given to the establishment under his energetic management, and the Rue Buffon of to-day fitly marks,—in accordance with the excellent custom of our neighbours, — the boundaries of the extended ground by which the great naturalist succeeded in enlarging the Jardin des Plantes. Specially interested as Buffon was in the natural history department, which he largely increased, the botanical and mineralogical sections were not allowed to suffer. From China the Jesuit missionaries sent home rare plants, the King of Poland presented to the museum his invaluable collection of minerals. The professors forming the staff were the most illustrious French scientific students; the Jardin des Plantes formed, in fact, the great scientific centre of the world. From a simple garden of medicinal herbs, the Jardin des Plantes became under Buffon the home of a representative collection of the riches of the whole realm of nature, while the garden was entirely remodelled on the plan that exists in the present day. Such was the work of the great naturalist whom tradition has represented as writing his well-penned pages in court attire, sword by side, wig duly powdered, and lace and ruffle on neck and hands. Buffon was a *savant* who was also man of the world enough to appear in society without making himself conspicuous by any affectation of carelessness, or studied indifference to what he felt was none the less than science an element of agreeable existence.

To Buffon, who died in 1788, succeeded in 1792 Bernardin de Saint Pierre, the charming writer whose "Paul and Virginia,"—"the swan song of old dying France," Carlyle has termed it,—was, so Humboldt tells us, his most constant companion in his tropical wanderings. Here, in the Jardin des Plantes, all through the wild days of the Revolution, Bernardin de Saint Pierre retained his post, and in the quiet of the picturesque ivy-covered house which still stands in the midst of the garden toiled to enrich the collection under his charge. The National Convention favoured the museum; twelve new courses of lectures were founded of mineralogy, general chemistry, ceramic art, botany, as studied in the museum, and botany as studied in the country,* agriculture, zoology, human anatomy, animal anatomy, geology, and iconography; while a new scientific library was open to the public in 1794. In 1802 commenced the publication of the "Annales," continued to this day as the "Mémoires du Muséum." The collection continued to increase with rapidity. Humboldt's famous collection of plants was added to the botanical department, while among the distinguished professors on the staff of the institution, Cuvier was at the head of the department of comparative anatomy, a science of which he may be almost said to be the creator.

From time to time during the present century the Government has voted large sums towards the enlargement of the ever-increasing museum.† Since 1793 fresh chairs have been established, of comparative physiology, applied physics, anthropology, paleontology and vegetable physics. The lectures, it may be remarked, like those of the Collège de France, are all entirely free to the public, not even the formality of cards or tickets being enforced; and many are the pleasant recollections that any one who has resided in Paris,—especially if he be a stranger,—must retain of the facile elegance of diction, the clear exposition, of the professors of the museum.

If the zoological collections have not, so far, been lodged as sumptuously as are now ours, yet probably their scientific value is, if not superior, certainly equal. The collection is, indeed, reported to be the richest in the world. There are more than 2,000 mammalia, over 6,000 birds, over 18,000 fish, 25,000 articulated animals, and an incalculable number of molluscs and zoophytes. The library contains some 20,000 volumes, and the collection is rich in original botanical drawings; the botanical galleries contain about 35,000 specimens of plants, not including fruits and woods; the geological gallery, with its 60,000 specimens, is one of the richest collections in the world. The gallery of comparative anatomy, if it falls, perhaps, short in interest of our Hunterian Museum, contains none the less over 25,000 prepared specimens, 6,000 dried, 5,000 in spirits, the rest in wax and plaster.

In the garden itself, where still may be seen, as a relic of the original foundation, the section of medicinal herbs, all carefully labelled and arranged in beds in strictly scientific order, the menagerie offers freely to the stranger, and the children who always crowd the walks, all the pleasures of our own favourite Zoological Gardens. Science, in fact, at the Jardin des Plantes is placed before the public in its most attractive and agreeable aspect. Severe research, however, is none the less pursued by the learned professors, revered *savants* of world-wide fame,—such men as Milne Edwards, De Quatrefages, the veteran nonagenarian chemist Chevreul, and Becquerel, who only within a few weeks past has succumbed to a life of constant toil; professors whose labours hold high in the history of the scientific progress which marks in our century the reputation of the Jardin des Plantes.*

AN ARITHMETICAL DETERMINATION OF THE DEMAND OF TRADE FOR A BRIDGE EAST OF LONDON BRIDGE.

It may, or it may not, be desirable to erect a permanent crossing of the Thames eastward of London Bridge, at the cost of two or three millions of money. The subject is a grave one. It has been long before the public. Much has been said on both sides. Much more, no doubt, remains to be said. But the recent report of Sir J. W. Bazalgette, coupled with the statistical information published "by authority" on the following day, is certainly calculated to support the view taken by Mr. Barlow, rather than that of the advocates of bridge or tunnel.

Sir Joseph puts the case that London extends, as the crow flies, four miles to the east, and six miles to the west, of London Bridge. On the western six miles are, he says, twelve bridges, which have cost, or will cost, 6½ millions sterling, paid by the rates of the whole metropolis. To spend another four or five millions in providing, also out of the rates, an eastward crossing, would, Sir Joseph thinks, be fair to the East Londoners. If we were looking at a design for a city to be built, there would be some force in that symmetrical view. But as it is, the first point to decide is, whether there really is a want for the accommodation that looks so fair upon paper.

East London, north of the Thames, Sir Joseph puts at 894,000 souls; south of the river, at 655,000. But the fact that these two immense districts have grown up without either establishing a communication across the river, or making much use of the communications already provided, certainly looks as if the course of trade naturally ran east and west, and not north and south, in this end of the town. And, if this be the case, it is hard to see how the building of a high-level bridge, or of a tunnel, would do much to facilitate trade.

A high-level bridge at the Tower, a tunnel at Shadwell, and another at Blackwall, at a total cost of 5,200,000*l.*, is the magnificent project now proposed! As this involves a rate of 1½d. in the pound for sixty years, the ratepayers ought to have full information as to the utility of a scheme involving such a call on their purses.

Over the twelve bridges now existing (taking no count of the railway bridges, or of Putney and Hammersmith bridges) 371,057 pedestrians passed, on an average, during twenty-four hours in August last, being a little under 31,000 per bridge per day. But Westminster, Lambeth, and Vauxhall Bridges, which gave passage to 72,288 pedestrians, or one-fifth of the total number, accommodate, not a north and south, but an east and west traffic. Chelsea, Albert, Battersea, and Wandsworth, again, which complete the twelve, are rather suburban than metropolitan bridges, giving passage to only 34,794 passengers between them, or about 8,700 per diem each. Our investigation of traffic, as an indication of call for accommodation, is thus confined to the five eastward bridges which span the Thames within the distance of one mile and a half, although Charing Cross Bridge lies as fair for the east and west as for the north and south traffic, and is comparatively insignificant as a crossing.

Over these five bridges, then, on the day taken, passed 264,175 pedestrians, being at the rate of 52,835 per bridge, or almost exactly 100 passengers per yard of the centre line of the river crossed. The distance from the middle of Charing-cross Bridge to a point halfway between London and Southwark bridges is 2,400 yards; and the traffic per yard of river over the four bridges comprised is sixty-four passengers per diem.

London Bridge, on the other hand, has to be credited not only with half the distance from its own position to Southwark Bridge, but with the traffic from four eastward miles for which it is now proposed to build bridges. At this rate, only 15·2 passengers per yard of river to be crossed make daily use of London Bridge. Draw the eastward line where we will, the proportion of traffic to area that necessarily seeks London Bridge is very much less than that which seeks either of the great bridges westward. Thus the zone served by Blackfriars Bridge, if we take it to points equidistant between that structure and Southwark and Waterloo bridges, is just 800 yards. This gives almost exactly 100 passengers per yard per diem, which we before found to be the mean for the five bridges. This, therefore, may be taken as a fair test of the proportion of passengers to bridge room. At the same rate, the traffic over London Bridge will all come from a district reaching 800 yards to the east of it,—that is to say, to the Tower. If the district between Allhallows and the Tower has as much north and south traffic as the Blackfriars zone, and if all this traffic seeks London Bridge, not a single passenger from North or South London, east of the Tower, now seeks to cross the river at that point.

This is, no doubt, a new way of looking at the matter. But it is a mathematical way. And the outcome is, that the actual trade east of London Bridge is not demanding bridge accommodation. What may be done, by providing such accommodation, to create a trade is another question. Is it worth the outlay of 5,200,000*l.* to solve it?

The above was in the printer's hands before the appearance in the *Times* of the letter from Sir J. W. Bazalgette, of October 13th, in which he says that "the existing traffic between Hammersmith and Battersea Bridges is 332,000 foot passengers, and 65,000 vehicles." What these figures mean, and how they were arrived at, Sir Joseph will no doubt explain. According to the "official statement," the daily traffic over Battersea, Wandsworth, Putney, and Hammersmith Bridges, all taken together, amounts to a total of 25,145 pedestrians and 4,302 vehicles, so that there must be some strange error somewhere. We would be the last persons to make much of a clerical error in figures, knowing how easy it is to substitute a wrong column in the copy prepared in haste for the printer. But when an argument is based on a great error of figures the case is different. Sir J. W. Bazalgette's argument is, that the existing traffic over the bridges from Hammersmith to Battersea (nearly four miles by water), indicates a minimum for the future traffic over a bridge or bridges for four miles east of London Bridge. Taking this to be a sound inference, we really obtain only about 1-13th of the traffic of 332,000 foot passengers claimed by Sir Joseph. Further, the four existing bridges are on levels convenient for road traffic. A very great reduction (no one can say how great) on a normal amount of traffic would be due to the physical difficulty of rising to a high-level bridge, or descending to a tunnel. And if, on Sir Joseph Bazalgette's own argument, only about 8,000 pedestrians per day are to be expected to use each of the three new crossings, which are to cost 5,200,000*l.*, the disproportion between cost and estimated utility becomes absolutely ludicrous.

* Excursions out of Paris, under the direction of the professors, are often made during the summer months.

† Only a few years since, the Chamber voted a grant of six millions of francs (240,000*l.*) for the rebuilding of the museum.

* At the opposite end of Paris, and nearer the fashionable neighbourhood, the Jardin d'Acclimitation has, within late years, sadly robbed the old Jardin des Plantes of its vogue. The aims of the younger society, however, are very different from those of the grave museum. It is intended merely to introduce into France, for purposes of profit or pleasure, whatever foreign animals, birds, dogs, and plants may be found to thrive in the climate.

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THE END OF THE CHANNEL TUNNEL.

His Royal Highness the Duke of Cambridge has done good service to the country. He has put in a few nervous and well-balanced sentences the case of the Channel tunnel as regarded from a military point of view. We shall not attempt to abstract this authoritative counsel. It ought to be read and re-read by any who have yet a lingering idea that a tunnel, if possible, is desirable. For ourselves, as our readers are aware, we have all along doubted the first of these points, and disputed the second. We have seen no reply attempted to the remark of Mr. Bateman, that all the river valleys in England are marked by faults, and that no explanation of the existence of the Straits of Dover, except by the occurrence of a geological fault, has hitherto been attempted. And the ignored fact that the dip of the Straits on the French coast is twice as sharp as that on the English, seems to us to be only one of those which strongly confirm the view of Mr. Bateman.

But while we are content to admire, and to ask our readers to admire, the treatment of the military part of the question by his Royal Highness the Commander-in-chief, we cannot but note how much the commercial question is illuminated by his remarks. How many millions will the works of defence that all military men admit to be necessary, if a tunnel be made, cost? What will be the annual cost of the fixed garrison of 7,000 men, who will have nothing to do but to watch the newly-created danger? Who, on any showing, is to be benefited by the large outlay? It has been suggested (mischievously enough) to the unemployed workmen that they would find their account in the scheme. Far better would it be for the country to set them to work in reclaiming Irish bogs,—or in digging sand from the sea-shore to be replaced by the next tide! As to paying traffic,—the projectors of the scheme have never replied to our challenge on that point. We have shown that the coal for ventilation alone would cost about a third of the largest net earning that could be anticipated; let alone all sorts of unforeseen expenditure. Cost of transport through the tunnel would be three times that by sea, for working expenditure alone. The vast question of interest on outlay is untouched in that calculation. It might be difficult to point to any scheme, brought forward at any period of our history, the results of the accomplishment of which would be, in the opinion of most of those competent to judge, so disastrous. We may safely challenge the records of human folly to show any project which has received so much attention, not to say so much ill-informed approval, while so utterly unsupported by statistics, or by ordinary commercial reasons. We hope that this report will finally extinguish this mischievous project.

THE POVERTY OF THE WORKING CLASSES.

Under this title some letters have recently been published in the *Times*, which cannot have failed to interest those who are heedful of the social improvement of the English people. Mr. William Hoyle, of Bury, commenced the correspondence, which was continued by Mr. George Potter, the Rev. S. A. Barnett, and others. But, in truth, though important phases of a social problem of high importance are brought into prominence, these letters do not produce any conclusion which was not already more or less obvious. The point which, as we understand Mr. Hoyle, he desires to establish is that, since large numbers of operatives are thrifty and well to do, and a large number are quite the reverse, the latter are in this position because they squander, or, at any rate, do not save some part of their wages. "The question," he says, "then presents itself, how comes it to pass that one section of the operatives of the country are found in such poverty and misery, while another section, earning no better wages, are living in peace and plenty? It is all owing to the way they spend their wages. If those who are in misery begin to live and act rightly, to shun the public-house, and spend their money properly, they soon rise out of their misery and degradation, and, like the others, become happy and comfortable." The writer then shows how money earned by large numbers of operatives has been wasted, and how a thrifty workman may save, and in time place himself above the reach of want, and that the chief channel of waste is intemperance. So far as we understand Mr. Potter, he desires to show that the thrifty workmen as a rule form the bulk of the members of our trade and friendly societies, and that as much money is wasted by those in higher grades of society as by the operatives. There can be no question that both Mr. Hoyle and Mr. Potter are more or less correct in the positions they have taken up. No one can doubt that if the thriftless workman would follow the example of his economical brother, he would be better off and that less wealth would be wasted, nor, on the other hand, that the trade-unions and friendly societies contain a great proportion of the thrifty operatives, so far as they are members of large trades in large towns. On the other hand, the great number of workmen in small provincial towns, and who work at what may be called miscellaneous trades, must not be left out of account. Moreover, we have no manner of doubt that the workman who puts his money into a savings-bank or invests it for himself is more worthy of imitation than the man who puts it by as a subscriber to some trade union, whereby he puts himself under various restrictions. The Rev. S. A. Barnett, the well-known Whitechapel clergyman, points out that the workman who earns 30s. per week, and who spends of this sum 20s., and puts by 10s., cannot live in comfort and happiness. Further, that the mere saving of money is not sufficient; that the man who barely exists and saves money, leads "as mean and low life in one way as a drunkard or a spendthrift in another." In this statement there is a certain amount of truth; the workman who leads a joyless existence, though he may have money in the bank, cannot be considered as living a desirable existence, but the mere fact of self-denial and of thought for the morrow forming part of his life, necessarily raises him to a higher moral and mental place than that of the workman who spends his surplus earnings in self-indulgence. Moreover, Mr. Barnett seems to overlook what may be termed domestic joys, which must exist in any well-ordered and thrifty home, even though in that home there is not "an easy chair," and though the operative "cannot have books nor send his family for change of air." That he cannot have books we deny, because it is absurd to suppose that, with the abundance of cheap literature which exists, a workman who earns thirty shillings per week, and as the typical workman of Mr. Hoyle's letter does, puts by, as a rule, ten shillings, cannot now and then afford sixpence or a shilling for a book, a newspaper, or a periodical. At any rate, where free libraries exist the workman always can obtain books when he wishes them, and it is because free libraries, museums, and exhibitions, open both on week-days and Sundays, are so unbounded a boon to thrifty working men and help to attain that object which Mr. Barnett rightly considers so necessary, namely, the making of "life fuller, happier, and more worthy a man's manhood," that we have always advocated them so strenuously.

To return to the question of the poverty of a large section of the workmen of this country, where, as Mr. Hoyle shows, the population of the United Kingdom have in ten years spent 1,364,000,000*l.* in drink, there cannot be a doubt that the happiness and comfort of this section will be largely increased by an increase of sobriety in the country, and by a smaller expenditure in intoxicating drinks. That, we take it, is evident, and that also is about the only distinct point which can be laid down. For an increase in economy and in happiness of those poor and miserable workmen who spend their money in follies or do not put it by for a rainy day and for old age, can only be obtained by the general improvement of all classes in thoughtfulness and self-restraint. We then are face to face with all sorts of social problems, the marriage of healthy couples, improvidence in marriage, waste of money in female dress, the effects of the poor-law, and numbers of others, which there would be no difficulty in enumerating. But there can be no doubt that correspondence such as that to which we have alluded, and which affords ground for more comments than we have here made, although it does not or cannot lead to any immediate and practical result, shows not a little where the error lies, how possible it is for operatives to be thrifty and to cease, in their days of age or sickness, to be burdens on those of the community who have money in their hands. It is abundantly clear that vast numbers of our operatives are spendthrifts; it is equally clear that equally vast numbers are men who show forethought by not living up to their incomes, and we can but hope that the "lucidity," if we may use Mr. Matthew Arnold's latest phrase, which is now so much more apparent in regard to sobriety, to poor-law relief, to improved dwellings, and to art for the masses, as well as to scores of social problems, will, as the years go on, gradually increase that already large section of the operative class who are sober and temperate in all their ways.

HANSEN'S POLYCHROME PROCESS.

In the opinion of some German critics the art of polychrome decoration, as employed by the ancient Greeks and Romans in their wall paintings and ornamentation of public buildings,—an art which had hitherto been lost,—has been rediscovered by the Austrian artist Hansen. M. M. A. Turner, of Munich, takes advantage of certain works exhibited by French artists in the present Vienna International Exhibition to contrast them with the polychromes of Herr Hansen in the New Parliament Houses at Vienna. He speaks first of the polychromes of M. Dubocq, representing his ideas as to how the Parthenon should be restored. According to this French artist, the surfaces of the walls between the columns both on the inside and outside of the Parthenon are blue, and covered with warlike scenes; the columns are of a yellowish red tone, while the bases of the temple and the pediment are painted red with ornaments. The triglyphs are blue, and the reliefs of the metopes white upon a red background. Such is the general combination of colours in M. Dubocq's project of a restoration. The interior is treated in a manner analogous to the exterior, only in the entablature parts the colour is more intense. In the centre there is an Athene with yellowish drapery, and with the vermilion Medusa head on her bosom. "The *ensemble*," says M. Turner, "is a polychrome, than which it would certainly be impossible to imagine anything less prepossessing." The colours here stand out hard and inharmonious from the body of the work, instead of infusing life into it, nor is there anything at all in the way of a harmonious blending or equipoise between the colour and the light and shade. Another example of the same view of antique polychrome painting is seen in a second work which has been sent to the Vienna International Exhibition from the Spanish Academy at Rome. It is an imaginary restoration of the Temple of Antoninus and Faustina. The only difference of importance between this exhibit and that of M. Dubocq is that the ground colour between the columns is red instead of blue. The mere fact that the ornaments appear painted on a coloured background with colours that fail to blend harmoniously, or compensate one another, is the source of much unclearness in both cases, and accounts for the lack of those soft and gradual stages of transition which are absolutely requisite as a set-off to the contrasts of light and shade. In this connexion a fine opportunity is offered in the Parliament House in Vienna for making an instructive comparison.

In the polychromes executed by Herr Hansen, that artist has carefully avoided bringing together too many colours. Generally with him the ornamentations and ornamental constituents in gold stand out from a coloured background, and do so sharply enough to bring out the division, and yet so as to complete the whole in a perfectly harmonious manner without those harsh and ugly contrasts seen in the French projects above mentioned and in other instances that might be quoted.

It is, indeed, a surprising spectacle which presents itself to us in those decorative paintings which are already finished in the interior of the Austrian Parliament House, although as yet not a single room is perfectly completed. The effect is finest in the chief apartments of the House, which are all connected together,—we mean the two halls of session, the assembly-room, and the peristyle; their plastic elements are composed right up to the ceiling of pure marble, while in the Peristyle even the wall surfaces are of antique cipoline, and here it is that we have an example of the coloured treatment of an ancient architectural creation such as surpasses in its completeness anything yet seen. Compared with the effect here achieved by Hansen, all earlier attempts of the same kind such as those in the Propylæa at Munich, the

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restoration of the Tuscan temple by Semper, the polychrome decorations of the Æginetan pediment in the new museum at Berlin, all fall very far behind; and, indeed, we may make bold to assert that it is only now that we have practically recovered the lost art of the ancient polychrome paintings and decorations.

But this is not the only service Herr Hansen has rendered by the execution of these paintings. He has likewise discovered anew, it is asserted, the hitherto lost process of the ancient art employed in the production of wall-paintings, the process, namely, which imparted to them their extraordinary durability. Thus in the Festival Saloon of the Parliament House a series of panels are at present being filled with decorative work, which, when finished, will, it is hoped, be perfectly secure against external influences, and which may hereafter be washed without any fear of their suffering injury. The process followed in producing these decorations is extremely simple, and it was discovered by Herr Hansen chiefly by studying the wall-paintings of Pompeii. The surface of the wall is first covered with ordinary stucco, and then a thin layer of marble-dust of the colours required for the background is laid on like ordinary *stucco lustro*, and is rubbed smooth. Upon this the ornaments and figures are then drawn in the usual fresco colours, rubbed in with a little soap. Finally the whole is rubbed over with a smooth piece of hot iron, and the work is complete. By this process the paintings become intimately united with, and are, in fact, all of a piece with the substratum, forming an integral part of the plastic mass.

In his efforts to introduce the ancient polychrome painting into practice on this new basis Herr Hansen has met and is meeting with much opposition, but there appears no reason to doubt that he will triumphantly maintain his ground.

Whoever on principle rejects the painting of plastic works, or parts of them, has just now a favourable opportunity of observing the difference between the effect of architecture with and without polychrome decorations. It may be seen in the Festal Saloon of the Parliament House, where the door-cases and jambs of the two side doors still remain unpainted, while the main entrance-door of the hall is already finished in polychrome. In the latter how delicate and beautiful appear the different portions of the marble!—while in the former cases the effect is quite coarse, in spite of their noble plastic proportions. That the gilding of the acroteria and upper parts of the mantel-pieces at present has a somewhat glaring appearance need not trouble us; for, as other portions of the work clearly show, this effect will be toned down of itself in the course of a short time.

The present advanced state of the various portions of Hansen's work in the Austrian Parliament House enables the observer to form a definite opinion as to the value of his process, and the result of the examination is pronounced by Herr Turner to be, beyond question, most favourable to the system of polychrome decoration as revived by the artist in question.

NEW SYSTEM OF MURAL PAINTING.

The Royal Bavarian Academy of Arts at Munich appointed a Commission in March last for the purpose of investigating the merits of the system of mural-painting which has been perfected by Herr Keim, of that city. The report of this Commission has recently been issued, and it records the fact that the problem of rendering wall-paintings indestructible by climatic action has been solved by the new method. It is also stated, without hesitation, that when the merits of the system are fully known, an important change is likely to take place in mural-painting, both of a monumental and of a decorative character.

The system is, to a certain extent, founded upon the stereo-chromatic method of Schlotthauer and his fellow-workers, but professes to remedy the defect of insufficient durability which was complained of with respect to that process. The improvements made are in the fundamental ground and the painting ground, as well as in the preparation of the colours and the concluding fixing of the picture in its completed form.

The fundamental ground is, in some respects, the same as that employed in the stereo-chromatic process, being a mortar composed of slaked lime, sand, and water, which, after drying, is flattened with rough sandstone, and is afterwards impregnated with soluble silicate of potash. Before applying this mortar it is necessary, in new buildings, that the walling should be perfectly dried; while, in older buildings, the part of the wall intended to be treated should be laid bare to the stone, and the commissures scraped out. The painting ground consists, in the new process, of a mixture of 4 parts (by measure) of quartz sand, 3½ parts of marble sand, ½ part of fossil meal, and 1 part of quick-lime, which is stirred up with distilled water. A mass is thus produced, which is considerably strengthened by the admixture of carbonate of lime in the crystalline form of marble sand, and which, from its rough and porous nature, readily absorbs the colours which are subsequently applied. The addition of silicic acid, finely decomposed in the form of fossil meal, promotes the formation of silicate of lime, and thereby increases the hardness of the material and its capacity to resist chemical and mechanical influences of a trying character.

After being thoroughly dried, this painting ground is saturated with silicic fluor acid, which destroys any crystalline particles of carbonate of lime which may be on the surface, and opens the pores of the material for the absorption of the colours to be laid on. According to the stereo-chromatic process the colours are only laid on with water; but by Herr Keim's system (as described in the *Deutsche Bauzeitung*) each colour receives in its preparation a certain admixture of a nature suited to its special properties, which is intended to promote the solidity and durability of the work.

In order to prevent the darkening or lightening in the shade of certain tones of colour, which is sometimes produced by the final application of the soluble glass used for the purpose of fixing, the colours receive before use an admixture of potash or ammonia. By this means they do not alter in shade, and the painter is saved the trouble of calculating what shade the colour he is applying will be after it is subjected to the process of fixing. The colours are delivered by the factory almost ready for use; only requiring to be rendered thinner according to circumstances by the addition of water. The fixing of the completed picture is finally effected by a wash of soluble glass containing an admixture of caustic potash and caustic ammonia. This is not applied cold, but warm, to the wall surface, which has previously been dried to the stone. When the weather is cold or damp, this drying is promoted by a specially constructed iron stove. To complete the process and to prevent the subsequent appearance of the alkali, which becomes free in the form of a white dusky coating, the fixed picture is again treated with carbonate of ammonia. For subsequent cleanings, washing with water is sufficient.

As a proof of the weather-resisting properties of wall-paintings executed according to this system, it is stated that Professor Lindenschmit buried such a picture during the whole winter of 1880 in the snow under a gutter, without the slightest injury resulting. The Commission to which allusion has been made has further established the fact that the placing in cold or hot water, and the application with brushes of water, alkalies, diluted and even concentrated acids produced no injurious effects worth naming, and that the pictures thus experimented upon continued after these tests to display hardness and imperviousness to mechanical influences.

Apart from these properties of resistance to the effects of climate, the clear white painting ground shows up the colours, particularly ultramarine shades, in a bright and effective manner. The paints are easily applied and blend well together; the production of a pleasing and harmonious effect being facilitated in many ways by the process in question.

Poor-Law Buildings in the Metropolis. The Wandsworth and Clapham Board of Guardians have unanimously resolved that ten acres of land, situated between Allfarthing-lane and Garrett-lane, Wandsworth, be purchased of Mr. R. Davis, for 10,000*l.*, for the purpose of erecting a new workhouse, or for such other purposes as the guardians, with the consent of the Local Government Board, might determine.——The Lambeth Board of Guardians have agreed to purchase of Mr. Woolley 2 acres, 3 roods, 9¾ perches of land, copyhold, at 1,250*l.* per acre, for the enlargement of the Norwood Schools.

A NEW ELECTRIC RAILWAY.

The Austrian Ministry of Communications has granted to the Südbahn or Southern Railway Company the concession for the construction of an electric railway to run from Mödling to Brühl in the suburbs of Vienna. This will be the first electric line in the Austrian capital. It will be about three kilomètres, or two miles, in length, and will run from the Mödling railway-station on the southern line, through the village of Mödling, and thence through Klausen to Vorderbrühl. It will be a single line. The gauge is one mètre, and the gradients are not to exceed fifteen in the hundred, while the minimum radius must not be smaller than thirty mètres. The maximum speed allowed by the terms of the concession is twenty kilomètres, or about twelve miles and a half an hour. There are to be halting and signal stations at the most frequented crossings, and they are to be connected together by telegraph or telephone apparatus. The carriages of the new line are to contain eighteen seats, besides standing-room for a few more passengers. Each carriage will be fitted with its own electrical conducting apparatus, and the traffic will be worked by a stationary steam motor of at least forty horse-power, and two machines for the production of the electric current. The new line is to be finished and be opened for traffic by the 15th of July, 1883.

INFERIOR PORTLAND CEMENT.

The adulteration of Portland cement continues to attract considerable attention among Continental builders, and the subject is under constant discussion in the clubs and periodicals of the profession across the North Sea. One of the most interesting of the recent contributions to this question is a pamphlet by a German mining engineer, Herr Roth, who deals especially with the adulteration of the cement by means of blast-furnace slag or cinder. Herr Roth entirely agrees with the Society of German Cement Manufacturers in rejecting the mere addition or mechanical admixture of this material in the production of Portland cement. He inquires into the essential ingredients of which the cinder is composed, and shows that it always contains, amongst other constituents, one compound which is highly injurious,—that is to say, sulphuret of calcium. In order, therefore, to obtain a useful cement from blast-cinder, it is necessary in some way to remove or neutralise this substance, and, by adding certain other materials, to obtain an article which corresponds in composition with real Portland cement. The practical point of Herr Roth's researches is, that he recommends the employment of Bauxite along with lime. The former material, owing to its containing free argillacious clay-hydrate, suffices, with the addition of a certain proportion of lime, not only to convert the injurious sulphuret of calcium into a harmless compound, but produces, with the furnace-slag, a resulting mixture agreeing in all essential respects with real Portland cement. The inventor of this system states that, while the quality of the new article is equal to that of the best Portland cement, it can be produced at considerably smaller cost.

STRAW AS A SUBSTITUTE FOR WOOD.

The invention by which straw is used as a substitute for timber is an American one, and if the material fulfils all that is prophesied of it, it will probably interfere considerably with the timber trade. The following account has been published in America of this new substitute for wood, and re-issued by the Society of Arts:—The straw timber is said to be adapted to many kinds of finishing work, panels, counter and table tops, fine doors, and ornamental work, and it said that it can be produced and sold in competition with the finer grades of pine or wide walnut, at about one-half the price of the latter. The standard manufacture is in widths of 32 in., a length of 12 ft., and a thickness corresponding to surfaced boards. These dimensions may be varied to suit such orders as may be given, and embrace any width, length, or thickness. Unlike lumber, however, narrower widths are the most costly. The straw lumber may be ripped with the hand saw, or upon the buzz saw; may be run through the sticker for the manufacture of mouldings, and takes a nail or screw as well as oak. It is, practically, water and fire proof, being manufactured under 500

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degrees of heat, and it is stated to have stood boiling some hours without any apparent change of structure. Its tensile strength is greater than that of walnut or oak, and its weight about one-fifth greater than the former, when dry. It is made from any kind of straw, including hemp and flax fibre; in fact, from any material that will make pulp, and a ton of straw will produce 1,000 ft. of boards. The pulp is rolled into thin sheets, a number of which, corresponding with the thickness of the lumber desired, are placed together with a peculiar cement, which is claimed to be waterproof, and are then rolled under a pressure sufficient to amalgamate them into a solid mass, which may be worked with a plane, if desired.

When it is remembered that it takes 100 years to grow a tree to maturity, suiting it for commercial purposes, and a tree producing 32-in. lumber will require fully twice that time; while 20,000 ft. per acre is a large yield under the most favourable circumstances, it will at once be realised that where 2,000 ft. can be taken from an acre of ground for an indefinite number of years, the process which enables such a result to be accomplished, and which will yield a really valuable lumber, should be one of great importance.

GLAZED BRICKS.

The Union of German Architects and Engineers has been endeavouring to collect information on this subject, and a contribution of interest has been afforded by the statement of the Hanover Architects' Society which recently organised a commission respecting the matter. From the numerous examples of Mediæval ecclesiastical architecture in Hanover, it would seem that the use of glazed facing bricks did not become usual until the earlier part of the fourteenth century. The market church in the City of Hanover is considered the oldest important specimen extant of building with glazed facing bricks, which are used in the windows and doorways, on the slopes of the window-sills, &c.

From the middle of the fourteenth century, the use of glazed wall bricks continued in favour not only for ecclesiastical purposes but, also in ordinary house-building. On the other hand, it is stated that glazed roofing-tiles were only used on a limited scale during the Middle Ages. It would seem that the substances used in the process of glazing did not in those times materially differ from those in use at the present day. It is supposed that the oxide of lead employed was prepared at the brick factories, and that it was a purer article than is now sold under that name. It is not certain that the glazing was applied to the bricks in their unburnt state, but such is conjectured to have been the case. It is remarked that in those ages wood fires were alone used, and thus it was possible at one operation to burn the brick and fix the glaze upon it. At the present day, the burning is usually done by coal fires from motives of economy, and wood fires are used for the separate operation of glazing, for which purpose they are specially effective. The glaze on Mediæval bricks was thinner than is the case with modern productions of this class.

In recent times glazed wall-bricks have been used in an increasing proportion. Since 1862 glazed bricks have been used in Hanover in building spires. The brickworks in the vicinity of the city of Hanover now make them in various tones of colour, and they have been as a rule found to be weather-proof. Absolute freedom from crazing has not been as yet arrived at, yet in from 50 to 70 per cent. of the bricks made this defect has been avoided; at least, to such an extent as to be visible to the naked eye.

The durability of glazed bricks does not directly depend upon their colour, but varies according to the composition of the glazing substance. Yet, as the composition of the glaze reacts upon the colour, it has been noticed that the darker kinds are, as a rule, better preserved. In the composition of the glazing substance each producer varies the proportion of the component parts according to the quality of brick to which it is to be applied, and according to the method of burning which he employs. As a rule, the proportion varies between one part of protoxyde of lead with one part of sand; two parts of protoxyde of lead with one part of sand.

For greenish-coloured glaze there is a less proportion of protoxyde of lead used than is the case with any other colour. For colourless glaze, three parts of sand and four parts of protoxyde of lead form a usual mixture. The sand used must be colourless and pure. Some makers add baryta in order to prevent the glaze from melting except at a high temperature.

The quality of the body of the brick is capable of exercising an important influence upon the durability of the glaze. The harder it is burnt the more complete will be the cohesion between it and the glaze, and the less fissures will there be in the latter. The danger of injury to the body of the brick from the penetration of frost is therefore reduced to a minimum. Small particles of lime in an undivided state are capable of cracking the glaze.

From these facts the following rules are deducted by the Hanover Architects' Society:—1. the brick which is to be glazed must be absolutely weatherproof and free from undivided particles of lime. 2. The mixture of glaze must be laid on very thin, and must be free from crazing, as far as can be seen by the naked eye. Absolute freedom from crazing is, of course, recommended if it can be attained. 3. Any considerations as to the colour of the glaze are of less importance than the good quality of the body of the brick and of the glazing substance.

A practical illustration of the necessity of using the greatest care in the manufacture of glazed facing bricks is afforded by the fact that at Altona the examination of the steeple of St. John's Church, for the purpose of repairing the cross, has disclosed the fact that the glazed bricks used in some portions of the steeple (and which have been in position about twelve years), have become so weather-beaten that they require to be removed. It is proposed to replace them by another make of glazed bricks, produced in Silesia, which has been employed in other portions of the church (more recently erected), and has been found to resist the influence of the weather in a satisfactory manner.

THE LADY CHAPEL REREDOS, CHICHESTER CATHEDRAL.

Our readers may be glad to have a fuller account of the reredos in the Lady Chapel of Chichester Cathedral, a view of which appeared in our number of Sept. 16, p. 372.

The altar and the reredos were given by Mr. J. F. France, in memory of his wife and family. She lies buried in the "Paradise" of the cathedral adjoining the Lady Chapel. The material used is polished alabaster, executed by Messrs. Farmer & Brindley. The subject is executed in Salviati's mosaic by the Murano Glass Company, of St. James's-street, from a cartoon by Mr. J. R. Clayton. There does not seem to have been an ancient reredos, for the original ashlar of coursed stone existed, and, curiously enough, it was proved by the discovery of a small portion of tiling *in situ* that there had been no difference of level between the west and east ends; the ancient altar, however, must have had a separate step, so it was determined to retain the ancient level, and give the altar a foot pace. Portions of the ancient detail of the piscina existed, and this gave the type of mouldings for the reredos, the curious cusp terminations being copies of those of the piscina. The detail of the rich tombs in Westminster Abbey of the same date were carefully studied, and that of Gervase Alard, in Winchelsea Church, built at the same period as the eastern part of the Lady Chapel, and of very similar detail to the piscina. The altar is of solid oak framing, bolted together by iron bolts passing through the columns. The marble "mensa" is an ancient one, which was discovered built up in the walls. The inscription does not show fully in a front view, as it returns on each side. The whole runs thus:—"✠ Deo spei nostræ—in dulcem memoriam Elizæ France famulæ Domini plenæ fide ac beneficæ—conjugis charissimæ meæ."

Many of the large windows of the chapel have been filled with stained glass by Clayton & Bell at Mr. France's cost. The general restoration of the chapel was carried out some years ago by the Dean and Chapter, under the late Sir Gilbert Scott and the late Mr. W. Slater; it was formerly a library, and the floor was lifted up to form a vault for the Dukes of Richmond, the floor was lowered, and the whole of the masonry and marble work, externally and internally, was restored. There, however, yet remains to be done the restoration of the roof and the east gable to the original higher pitch, still to be traced on the east wall of the choir. The original Lady Chapel was Norman and Early English, with a high-pitch roof, but when extended in the fourteenth century the western end was raised and the roof lowered in pitch so as still to keep its apex under the sills of the east window of the choir. It would be a most desirable work to complete, as the exterior much suffers by reason of the modern flat pitch and low gable.

THE PRESIDENT OF THE ROYAL SCOTTISH ACADEMY ON ART.

The annual Dundee Fine Art Exhibition was opened the other day by Sir William Fettes Douglas, P.R.S.A., who in the course of an address delivered on the occasion, said,—The attention now given to art in this country is one of the most curious of the innumerable, reasonable, unreasonable, and fantastic fashions of the day. Even fifty years ago art was recognised only by the few, and they recognised it as a very trifling, although sometimes pleasant, accomplishment, and never dreamed it could become as it is daily becoming, a great power in the world; indeed, it seems not unlikely to usurp a larger share of the world's attention than it can or ought legitimately to claim. Books of to-day very often consist of pictures, with a word or two of letterpress,—not, as in a proper division of labour, of letterpress, with accompanying pictorial illustrations. And we seem fast returning,—though under very different influences to the style of the earliest printed books,—viz., "The Bibles for the poor," which consisted of pictures only, or pictures with a word or two incorporated in the woodcuts. Indeed, unless it be in the gloomy regions of abstract science, every department of human activity calls in the assistance of art. Natural philosophy claims its help, history claims its illustration, romance seeks to add art's piquancy to its own; and I need not speak of its activity as an advertising medium. The word of the physicist is explained by it, and the mind of the child is ripened by it. Much of all this, as I said before, is the result of fashion; and it is to be hoped that before the fashion can change art will have become incorporated, so to speak, in the very nature of the next and succeeding generations, and will then hold its position permanently as a necessity of life. Nowhere has this change in art's position shown itself more remarkably than in the picture-books of the nursery. They represent a real advance; a generation ago they were worse than weak and uglier than bad,—now they are prodigies of luxuriant ability; and in this matter we must recognise a vital factor in the progress of art generally, because the unconscious education children receive from these silent companions,—their picture-books,—must have a permanent effect upon their future tastes and habits; and the improved and really high quality of many of the childen's books of to-day will render even the most obtuse among them impatient of the presence of all that is rude and unrefined. As in morals, constant contact with pure and upright conduct is the best, indeed the only true, education, so in art familiarity with beautiful,—not necessarily expensive,—objects will inform better than a thousand schools. They speak a language which does not need to be learned, and is more eloquent than the thousand conventions and rules of a thousand teachers. Next to the influence of children's picture-books in the formation of art feeling,—but, as I sincerely believe, only next to, and not before them,—is the influence of art exhibitions. They appeal, no doubt, to the riper and more cultivated mind, and ought to carry on and further the education earlier begun; but though theoretically true, this is not always practically possible. We have the best art-power of the whole world producing children's books and illustrations to popular literature; while all local exhibitions must depend more or less on local ability. Keeping this in view, the Committee of the Dundee Fine Art Association deserve no ordinary praise for the collection they have this year gathered together in these rooms. It is probably the finest exhibition hitherto seen north of the Forth, and it is to a great extent free from any local or provincial character. Some of the most eminent of our English contemporaries are well represented upon the walls, a[illegible] proportion of the members of

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our Scotch school seem to have put their best foot foremost, and show themselves literally in their best colours. The public and artists themselves are quite unable to appreciate the labour and the various annoyances and difficulties,—I have even heard of dangers,—encountered in getting together such an exhibition as this, and no one who has not served on a Committee of Arrangement, or, as it is termed professionally, a Hanging Committee, can understand the embarrassment, and not seldom the pain, experienced in making final decisions. A member of the Hanging Committee ought to begin his labours with the principle that he must have no friends, and when he has finished he will probably find himself blessed with many enemies. It is almost impossible to do justly and love mercy in exhibition arrangements; these two qualities are generally found to be absolutely incompatible with each other; moral reasons, conventional reasons, and mechanical reasons, all make a tangled skein of his best intentions, and he who went in as a man of principle and benevolence comes out of the ordeal a demoralised cynic. I see it stated in your leading journal that your last exhibition was relatively in one respect more successful than any other in the country, or indeed in the empire. And the Exhibition Committee of a smaller and more local exhibition in a town not a thousand miles from this place, makes a somewhat similar assertion. The statement is founded simply and solely upon the large amount of sales effected during the season; and there is a congratulatory chuckle accompanying this very satisfactory statement which would be allowable enough did it not stand alone in an apparently all-sufficient isolation. I sincerely hope, and do not doubt, the present exhibition will afford its promoters an equal amount of satisfaction from the same point of view, and there is no doubt men must live before they enjoy life; but committees and councils may not forget that such gatherings of works of refinement and beauty are not mere bazaars, and are, or ought to be, primarily for the advantage of the public, and the advancement of local and ultimately of national taste. In this country, and in the vast majority of the very best of us, a love of art is an artificial accomplishment, and not a spontaneous feeling. Probably the spontaneity will supervene after ages of culture, for habits of mind are as certainly transmissible as habits of body, aptitude for culture not less so than tendency to crime; and with our mind's eye we may look forward to our successors possessing intuitively that sense of the beautiful and the true which may make life in itself and its surroundings one long enjoyment.

THE ROUND ARCH IN THE "POINTED STYLE."

How difficult it seems to be at the present day to give anything an appropriate name. New towns, new streets, and new houses all have to be named, and some one has to invent or discover appellations for them, but whether the godfathers and godmothers are at fault or whether the infants are themselves to blame, there often seems to be little connexion between what the thing really is and what it is called; thus we find a street of closely-built houses will be called "Dash Park" or "Something Grove," and some specially dismal alley or court will be called "Pleasant-place" or "Paradise-row." This difficulty of naming anything seems so great that in a new district of London called Queen's Park, the avenues are called after the letters of the alphabet and the streets after the numerals. The invention is an American one. Now, when so much difficulty is experienced in naming a street, that we are obliged to have recourse to the first letters of the alphabet or to the numerals, it is not to be wondered at that we are quite incapable of giving a name to a style of architecture, and this must, we suppose, account for the introduction of such an unsatisfactory name as the "Pointed Style" applied to the Mediæval architecture of Europe. We cannot, for several reasons, regard the name as a good one.

When we speak of the "Pointed Style," it must refer and can refer only to buildings erected with arches which come to a point, and therefore, for the name to be worth anything, it must exclude all buildings in which this feature is wanting. But if it can be proved that there are a very great number of buildings and other works in what is called the "Pointed Style," which do not possess this feature, then it is manifest that the name is inappropriate. Then, again, the word "Pointed" is a mistake in the way it is applied, because it is only used to signify the style in which European buildings are erected, and is not extended to works in Asia and Africa which possess the peculiarity of the pointed arch in as marked a degree as do European buildings. Some writers are even of opinion that the pointed arch came originally from Asia, and others claim Africa as the place of its origin. If, however, the pointed arch originated in Asia, it is a very remarkable fact that the eastern parts of Europe were the last to adopt it, and that we find the old Romanesque or other purely round-arched styles existing in Poland, Hungary, Servia, &c., long after they had been given up in the West of Europe. Russia may be said never to have adopted the pointed arch at all. Africa seems to be able to lay a better claim to the introduction of the pointed arch, and if the date of the Mosque of Touloon, at Cairo, is as early as that ascribed to it, it is probably the oldest existing building with pointed arches extensively used. The form of the pointed arch was of course, quite well known to the ancients, as is to be seen in the "Treasure House" at Mycenæ, &c. Hoskins, in his journey to Meroé, in Upper Nubia, mentions chambers and cisterns there with roofs formed by pointed arches, which he regards as the earliest example of that form of arch in existence; but as these buildings have no dates inscribed upon them, and as the history of all the buildings in Upper Nubia is more or less obscure, this statement of Hoskins is a mere conjecture. Wherever the pointed arch did originally come from, there can be no doubt that it was known many centuries before it became a feature in buildings. The ancients do not appear to have appreciated its merits, or we over-value them; and it is a great question whether it has exercised anything like the influence upon architecture which is usually attributed to it; it is also a question whether its influence was altogether for good! Do not let any Gothic man suppose that we are "*abusing Gothic architecture*" or the pointed arch: we are simply stating a view which has occurred to us, and one which we shall not in the least object to find refuted.

Now, we have three questions under consideration.

1. Is the term, the "Pointed Style," an appropriate expression when used to signify the Mediæval architecture of Europe?

2. What influence did the "pointed arch" exercise upon art, especially architecture?

3. Was that influence advantageous or the reverse?

With regard to the first question. We have already stated two reasons why we consider the expressions, "Pointed Architecture" and the "Pointed Style" inapplicable. The first is that it *cannot* include works erected in Europe, which, though thoroughly in the spirit of the style, exhibit no indications of the pointed arch; and the second is, that it *does not* include works in Asia and Africa which do possess pointed arches; and we will suggest a third reason against the use of the term, and that is the fact that the pointed arch was *never at any time* used all over Europe to the exclusion of the semicircular and other forms of arch, and, in fact, that all through the Middle Ages the round arch was extensively used, much more so than is commonly supposed. We will almost go the length of saying that in some parts of Europe Gothic was almost as much a *round*-arched style as a pointed-arched style! Also that it gains few of its peculiarities by the introduction of the pointed arch, and that it would have developed itself much in the way that it has done if the pointed arch had never been introduced. To take our own country first: we believe that the earliest examples of the pointed arch to be met with are in the nave of Buildwas Abbey, which was commenced in 1138 or 1139; the pointed arches are only to be seen in the lower portions of the building, whereas the clearstory has round-headed windows. We should have expected to find Buildwas Abbey possessing more Gothic development than works of the same period which do not possess pointed arches, yet quite the reverse is the fact. Malmesbury and Kirkstall Abbeys and Clifden-Hampden Church, Oxfordshire, present also the earliest examples of the use of the pointed arch, and yet in none of these churches do we find any of the marked and distinctive features of what is called the Pointed style. We have the heavy cylindrical columns, the absence of mouldings, the old cushion cap, and the general heaviness which distinguishes the Norman from the Early English style.

None of these buildings have so much the effect of Gothic architecture as the naves of Norwich Cathedral, commenced in 1096; or Peterborough, erected in 1117; or Ely, Henry I.'s time. In these three naves we find strongly accentuated vertical lines, produced by the subdivision of the piers, mouldings, and an effect of aspiring loftiness, with the absence of strongly-marked horizontal lines, which was evidently a preparation for the glories of the great Gothic interiors of the thirteenth and fourteenth centuries; but all these peculiarities and characteristics are wanting in the naves of Buildwas, Fountains, and Kirkstall, which seems to point out that the use of the pointed arch in these latter buildings does not show any advance in the road towards Gothic development in those early churches where it is found.

The struggle for mastery between the pointed and the semicircular arch which was going on all over Europe at the close of the twelfth and the commencement of the thirteenth century, and the way in which the architects of that period seem to have vacillated between the two is most instructive, and there is no doubt that in their minds the question must often have presented itself that whether the style then in formation would eventually adopt the new pointed form of arch or the ancient round form. During this period of doubt and indecision some of the most magnificent churches in Europe were erected; it is to it that we owe the glories of Chartres, Sens, Canterbury (the choir), the nave of Rouen, Glastonbury Abbey, the presbytery, Chichester, the west transept of Ely, Vezelay, in France, and other exquisite churches too numerous to mention. In Germany, Italy, Spain, and the Low Countries, the struggle did not take place until half a century later, and the round arch had as yet undisputed possession of the field. To show how undecided the question was at the end of the twelfth century, we over and over again find churches commenced with Gothic arches, and the round arch used in their later portions. As an example, the crypt of St. Joseph's Chapel, Glastonbury, has pointed arches curiously enough (four-centred pointed arches), whereas the chapel above has semicircular arches throughout; and the same is the case in France, at Chartres, Vezelay, Puy-en-Velay, Noyon, &c.

Although by the year 1200 the matter was settled in favour of the pointed arch as the rule, yet it has too often been supposed that the semicircular arch was entirely given up, although it was certainly less used in this country after the year 1200 than in France, yet examples of it are far more common than is generally imagined, and the examples are nearly always singularly pleasing, and serve to show that it was quite as capable of combination with all the distinctive features of Gothic architecture as the pointed arch, for instance, in the beautiful double doorway of the north transept of Beverley Minster; we find it in combination with richly undercut mouldings, clustered columns, and tracery. The entrance to the Chapter-house at Furness Abbey consists of three semicircular arches, adorned with the richest mouldings and dog-tooth ornament, and springing from jambs composed of a profusion of shafts. In the Retro Choir, or presbytery, at Chichester (commenced in 1230), the main pier arches are round, and adorned with rich Early English mouldings. They rest upon piers composed of a slender centre column with four detached shafts. The capitals are remarkably elegant examples of stiff-leaved foliage, and the bases well moulded. The effect of these semicircular arches is singularly beautiful. The western doorway at Llandaff Cathedral, the connecting arch over the lancet windows at Great Yarmouth Church, some of the windows of the cloisters at Fountains Abbey, are round-headed, although the work is quite developed Early English; and the same thing is to be seen at Byland. The doorway of the refectory at Rievaulx has a trefoil arch below the round one, and is purely of Early English character. At Chadlington Church, Oxfordshire, the south doorway is round-headed, with very beautiful Early English detail and rich undercut mouldings. At Broadwell Church, Oxfordshire, the

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north doorway is also round-headed, with Early English mouldings.

The western doorway of Lambeth Palace Chapel is another fine example of a doorway with a semicircular arch; it is very richly moulded, and is sub-divided into two divisions by a quatrefoil shaft, with moulded caps and round abaci, supporting trefoil-headed arches: the space between these and the inclosing arch is filled in by a quatrefoil, all well moulded.

At Llanthony Priory the windows of the central tower are round-headed. At Sherbourn Hospital, Durham, the windows are round and the principal doorway, although all the details are purely Early English. At Hartlepool Church, the arches which cross the aisles are round, resting upon fine clustered columns. In the choir of Boxgrove Priory Church, Sussex, and St. Giles, Oxford, we find richly-moulded round arches. In the transepts at York Cathedral, —1230-1260,— we find the semicircular arch used in a very beautiful manner in the triforium. The main arch to the triforium is richly moulded, and adorned with a double row of dogtooth; it incloses a four-light composition with three circles filled with plate tracery. This triforium is the most developed piece of Gothic architecture in the whole transept, and shows at once that the round arch was found to combine with tracery and rich mouldings quite as readily as the "pointed." In certain cases it lends itself better to the forms of tracery than does the other: this is especially the case when large circles are introduced into the head of the window. It must be acknowledged that the triangular space left above any large circle enclosed by a Gothic arch is a singularly ugly feature, which is avoided when the enclosing arch is round. This was evidently strongly felt by the French, who generally made use of the round arch over the great rose-windows of their west fronts. It may, in fact, be questioned whether the difficulty of filling up the space between the circle and the point of the pointed enclosing arch did not eventually lead to the abandonment of geometrical tracery and the introduction into tracery of the "vesica" which exactly meets the difficulty; this will be seen by comparing the eastern windows of Lincoln and Carlisle cathedrals. Beautiful as the east window at Lincoln Cathedral undoubtedly is, it has this one defect, that the circle does not seem to fit the space between the enclosing arch and the subsidiary arches. At Westminster Abbey, and above all at Rheims, this defect is very apparent. At Exeter, in the west window this space is filled by a small circle, and in other instances by an inverted trefoil, none of the make-shifts really get over the difficulty, and in fact, it was not till the curvilinear style of tracery was introduced that a satisfactory solution was arrived at. The great south window at Chichester and the east windows of Selby and Carlisle are most triumphant examples of the way in which a Gothic arch can be filled with tracery. It must be acknowledged that when curvilinear tracery succeeded to geometrical, we find few examples of the use of the semicircular arch in English buildings; in fact, in this country its use during that period may be said to have been almost confined to decorative work such as wall-painting, stained glass, metal-work, &c.; here and there, however, examples are to be met with, such as the arches above the windows at Penshurst, the east window of the south aisle, Ely Cathedral, the chief entrance to Yarnworth Hall, Westmorland, the archway to Fisher-gate Bar, York, the cusped arch supporting the parapet, Lumley Castle, Durham (this is late in the style); a small window at Broadwell Church with round head, looks like Decorated work. The Bishop's bridge at Norwich and some other bridges erected during this period have semicircular and segmental, or sometimes even elliptic arches. Those of Elvet Bridge, Durham, are probably of this date. Round, segmental-headed windows are also to be found; examples are to be seen at Carsington and Baldwin, Brightwell Churches, Oxfordshire, the Abbey gateway at Worksop, and Byfield Church, Northamptonshire. Semicircular roofs of the Decorated period are to be occasionally met with. That over the nave of Romsey Abbey appears to be of this date.

With the Perpendicular style the use of the round arch was, to a great extent, revived, and examples of its use are very numerous; the outer gateway at New College, Oxford, has semicircular arches and a barrel-vault built askew. The Dean's chapel at Canterbury Cathedral has semicircular vaulting and large east window of the most elaborate design. The wooden vaulting under the lantern at Merton College is composed of round-headed arches. The doorway to St. Paul's Chapel, and in the old altar-screen at Westminster Abbey, have also round arches. The practice during this period of filling in Norman windows and arches with tracery formed of itself a sort of round-arched Gothic. The effect is sometimes exceedingly pleasing. The Lady Chapel in the crypt at Canterbury Cathedral, and the eastern arches of the transepts at Norwich, are very fine examples. The monument of Cardinal Morton has its canopy composed of a very finely-treated semicircular arch, fitting in to the old Norman vaulting. Segmental and three-centred arches are very common in their style; the monument of Bishop Blowet at York Cathedral affords a magnificent example of the latter, and the window of the porch at Peterborough is a very good one of the former.

The lights of Perpendicular windows are frequently round-headed, while the arch of the window itself is pointed. A good example of this will be found in the screen of Abbot Islip's Chapel at Westminster Abbey. This is still more frequently the case when the window is square-headed. At Yarnworth and several of the Oxford colleges examples are to be seen. In very late Perpendicular buildings, the Pointed arch is the exception, not the rule.

During the fourteenth and fifteenth centuries the round arch was very sparingly used in France, though more frequently than in England. The arch of the great north window at Rouen Cathedral is semicircular, and very richly adorned with canopied niches running the whole way round it. Connecting the pinnacles which support the flying buttresses at Narbonne Cathedral, are a grand series of semicircular arches, finely moulded and of rather large span. At the cathedral at Troyes the parapet of the choir is formed by a series of round arches.

The round arch seems to have continued in use in Brittany throughout the whole of the Middle Ages. Examples of the fourteenth and fifteenth centuries exist at Folgoat, Guingamp, St. Jean du Doigt, Morlaix, &c.

The same remark may be made with respect to Scotland. Round-headed fourteenth-century doorways or windows are to be found at St. Giles's, Edinburgh, Aberdeen Cathedral, Roslyn Chapel, Linlithgow, Kirkwall, &c. Germany also retained the semicircular arch throughout the whole of the Middle Ages, and the examples of it are numerous and very interesting. One of our illustrations (Fig. I.) represents a most delicate and beautiful thirteenth-century doorway at Treves. This doorway is at the east end of the Liebfrauenkirch, and is one of the most perfect and beautiful examples of Gothic architecture in Germany. Its mouldings are richer than one is accustomed to find in Germany, and the carving is singularly graceful. This doorway leads from a cloister, which is a most interesting example of round-arched fourteenth-century Gothic. The windows have thoroughly developed "bar" tracery, but all the lights have round heads, and the inclosing arch is also round. The mouldings are all very rich, and the work excellent (Fig. II.). At Ecternach there is a small pilgrimage church of late fourteenth or early fifteenth century work which not only has all its arches semicircular, but the lights of the windows are also round-headed. The interesting gateway or gallery at the east end of Ratisbon Cathedral is composed entirely of round-headed arches, and dates from the fifteenth century (Fig. IV.). The Rathhaus at Freiburg, in Breisgau, has entirely round arches, or those composed of a series of inverted segments of circles; it is a singularly pleasing and picturesque building erected of red stone. The arches which support the upper story have hollow mouldings, which die down upon round columns without capitals (Fig. IX.). The round arch is also frequently used in Germany to support organ-galleries; a very fine example is to be seen at Vienna (called the Giant's Gate), St. Mary's, Wurzburg, Ochsenfurth, and the gallery above the shrine of St. Cymbert, at Augsburg. Brandenburg offers some very interesting examples of round-arched Gothic. The front of St. Catherine's Church is a very rich example; it will be seen from our illustration that this is ornamented with the richest tracery, without the use of the pointed arch (Fig. V.). Work of a somewhat similar character is to be seen at Lubeck. The fine rood-screen at Munster Cathedral, recently pulled down, afforded a charming illustration of the round arch used for ornamental purposes, and very profusely adorned with tracery and cusping, dating from the fifteenth century (Fig. VIII.). The Church of Iphoven, near Wurzburg, has a very interesting staircase of stone, ornamented with round-headed arches. The Thein Church at Prague has a very rich doorway, enclosed by a round arch. The Chapel of Castle Trausnichts, at Landshut, which is partly thirteenth and fourteenth century work, and partly late fifteenth century, has round arches throughout (see Fig. VI.), and the network vaulting is semicircular in section. St. Wolfgang's, Rothenburg, on the Tauber, has semicircular vaulting to the apse and side recesses of the nave. The chapel of the "Ebrachorhof," Nuremberg, has also round vaulting. The portal of the singular church at Chemnitz is round-headed.

Later in date, after the year 1500, the round arch becomes still more common, and we find it frequently used in windows. Examples are to be seen in the cloisters at Ratisbon, &c.

In civil and domestic buildings round arches are of very frequent use. Examples are too frequent to quote at Nuremburg, Prague, Landshut, Munster, &c. At the last-named place it is profusely used in the tracery decorations of gables. For bridges, gates, &c., its use is quite as common as that of the pointed arch during the thirteenth, fourteenth, fifteenth, and sixteenth centuries.

Throughout the whole of the Middle Ages the round arch was used in Italy; more frequently, in fact, than the pointed in some works which are quite of Gothic character, not a single pointed arch is to be found. The upper portion of the baptistery at Pisa is a case in point (Fig. III.). The magnificent fronts of the cathedrals of Sienna and Orvieto have few pointed arches about them, although they are among the finest works of Italian Gothic. In the beautiful Cathedral of Cremona the round arch is far more used than the pointed.

It must not be forgotten that, in addition to constructive architectural works, the use of the round arch in purely decorative work must be studied in order to arrive at a just appreciation of its influence during the Middle Ages. In this branch of the subject a great deal of new and most interesting information has been collected together by Mr. Westlake, in his excellent papers upon glass painting. Mr. Westlake's remarks and illustrations show distinctly that the Mediæval glass-painters certainly favoured the round arch, and its use may be found in their works through the whole of the Middle Ages. In wall-painting, also, we find a decided inclination towards the round arch, and that even in the middle of the fourteenth century. Amongst the paintings which adorned the wall of St. Stephen's chapel, Westminster, are some remarkable examples. One of these, the subject of which, unfortunately, it is not easy to decipher, as the figures are so mutilated, shows a very remarkable background, which appears to represent a vast hall or temple of very singular architecture, every arch of which is round. The well-known manuscript drawing of the imprisonment of the Duke of Orleans at the Tower, now amongst the Royal manuscripts in the British Museum, represents all the buildings as having round arches, although we know as *a fact* that London Bridge had acutely-pointed arches. This manuscript dates from the fifteenth century. Amongst early printed books we rarely find pointed arches represented. The *Nuremberg Chronicle*, 1493, though profusely illustrated with views of towns and buildings, does not show a single pointed arch, and the *Schatz-behalter*, 1491, only represents that form twice, whereas in the representation of the large Gothic church, called "Sibenundsibentzigist Figur" (seventy-seventh figure), every arch is shown round.

Our space will not allow our carrying out this inquiry to a greater length by entering upon the subject of cabinet pictures, &c., but we think that we have already shown that the round arch maintained an existence through the whole of the Middle Ages. In fact, there seems to have been a struggle going on between the two forms of arch not only during the twelfth century, but also during the thirteenth, fourteenth, and fifteenth centuries. During the three latter centuries, architects in England and France certainly favoured the pointed arch, but in Germany and Italy it never gained so complete a mastery over its rival as in England and France. The

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painters seem always to have favoured the round arch through the whole of the Middle Ages.

In Germany during the thirteenth and commencement of the succeeding century, a regular round-arched Gothic style was formed. It, however, does not seem to have stood against the "Cologne School,"—a matter, to our minds, greatly to be regretted, because, however grand Cologne Cathedral may be, it is simply a copy of French Gothic with all the French peculiarities exaggerated until they become faults. The great height of the French churches, the long windows, and slender columns are so exaggerated in the German imitations at Cologne and elsewhere as to give a wiry and metallic character to the buildings, and, for our part, we are bound to acknowledge that we consider the German churches which are not influenced by Cologne far truer examples of German art than those which have borrowed their inspiration from that vast cathedral. It is greatly to be regretted that this German round-arched Gothic style did not prevail, as, from the examples which are to be found of it here and there, it might have developed into a very pure and noble style of architecture. In Italy, it is true, we have a round-arched Gothic, but it is so influenced by Classical recollections and inspirations that it is never quite free from their influence; but in Germany the case was different, and the Germans might, but for Cologne, have established a style which would have possessed all the distinctive features of Gothic architecture combined with the round arch. In England and France the pointed arch was used in such a magnificent manner, and the style produced at the commencement of the thirteenth century was so remarkably magnificent that one almost ceases to regret the loss of the round arch; but in Germany the case is different, for there the buildings which are the most thoroughly removed from the influence of the round arch, and the most thoroughly developed into the Pointed style, are precisely those which are the least admirable. In England the severe discipline of the Cistercian order, and their almost puritanical objection to sculpture, painting, stained-glass, carving, and ornamentation in general, was of considerable advantage to a style just coming into existence because it forced architects to attend exclusively to the purely architectural development of the style, and probably produced that rich system of moulding which is so distinguishing a feature of English Gothic. Rosengarten's theory that the monks were attached to the old Romanesque style, and that the Gothic was favoured by secular architects may have been true of Germany, but we doubt it; it is not certainly true of England, as may at once be proved by comparing the Abbeys of Rievaulx, Byland, the choir of Fountains, with contemporary secular works, or works executed by secular architects. Nor do we quite agree with Rosengarten as to the advantages gained in German architecture by the Freemasons. The fact is, there was too much mere Masonic skill about German Gothic work, and however wonderful such works as Strasburg spire may be, yet there is too great a sacrifice of architectural propriety and simplicity to mere skill in workmanship, and it is a question whether the retention of the round arch would not have restrained the aspiring ambition of German architects and workmen within due limits, and have given a sobriety and solidity to its lator development which it certainly needed, we are led to this idea because wherever we have seen the round arch used in German Gothic, it always seems to have a beneficial effect.

As we have, we trust, shown that the round arch was never banished from Gothic architecture, and that it was alone during the fourteenth and fifteenth centuries that the pointed arch was in the ascendant, it must be evident to all that the influence of the latter upon European architecture cannot have been very deeply rooted or very lasting. It has been usually supposed that the round arch came into general use again through the revival of the Classical style or the Renaissance, but it is evident that other influences were also at work to bring it back again, and that the very transitory rule of the pointed arch would have come to an end, even if the Classical style had not been introduced in the sixteenth century. The fact is, that Gothic architecture was never in a thoroughly settled condition after the banishment of the round arch at the middle of the thirteenth century. From this time we find the arch getting more and more depressed until the appearance of the four-centred arch in England, and the three-centred arch on the Continent. There seemed to be a want of something equivalent to the semicircular or round arch, and nothing could be found quite to fill its place. The semicircular arch is so thoroughly commonsense, so simple in its construction, so convenient as to its form, and so structurally sound, that no architecture can afford long to ignore its existence. The inconvenience of the pointed form of arch was from the first felt in domestic work, and we find through the whole of the Middle Ages the domestic windows square in form; the point never came well under a flat ceiling.

In doorways, also, the point was felt to be inconvenient, and this accounts for the fact that we so frequently find the inner arches of doorways round or segmental in English buildings, and that the French used the lintel under their Gothic doorways, so that the arch, magnificently as they adorned it with niches, statues, &c., was really only a piece of ornament, the actual doorway being square-headed. As we have before pointed out, in purely constructive works the round arch was the rule, and the pointed arch the exception. A singular example of this occurs at Beverley Minster, where the arches of the triforium which are visible from below are pointed, but the purely constructive arches at the back of the triforium are semicircular. In bridges and engineering works the round arch is the rule, even in the fourteenth century. As the round arch was so eminently valuable on account of its constructive qualities, it becomes a question whether we have hitherto been right in considering the highest and most perfected style of Gothic to be that in which it is almost entirely thrust out of sight, and whether the fact of this concealment of the round arch does not show a certain decline and falling away from "the true principles of Gothic architecture." If this be so, those who strictly insist upon "true principles" ought to hold what we are in the habit of calling the "Transitional style" as the most perfect development of Gothic architecture, because in that style both forms of arch are used openly. We should not be surprised if a careful study of the influence of the round arch in Gothic were to lead to a renaming and redistribution of the different styles. In this case Norman work of the eleventh and early part of the twelfth century would be looked upon as early Gothic; the Transitional style of the latter half of the twelfth and the first twenty years of the thirteenth century as perfected Gothic; and the subsequent styles simply as different phases of its decline. To exclude the Norman of France and England from the list of Gothic styles, as must be done if the name Pointed style is ever universally adopted, must be a mistake, as so many purely Gothic features were developed in the Norman.

That the pointed arch alone and without mouldings or other features peculiar to Gothic architecture has little or no real Gothic effect, is proved by some of the arches at the Town-hall at Cologne, which, though pointed, have no effect of Gothic architecture whatever, owing to their being unaccompanied by other Gothic features, whereas the round arch from the screen at Munster which we have placed by its side our illustration, does not in the least mar in the general Gothic effect of the composition to which it belongs. What is still more singular is the fact that the Church of St. Eustache, Paris, has a wonderful Gothic look about it, though it possesses not a single Gothic arch or moulding. With regard to the later Norman or Transitional style, it certainly seems to deserve more attention and study than it has received, but one thing was wanted to make it the most perfect of all styles, and that was some kind of principle which might determine where the round arch was to be used and where the pointed. There was a little too much mere fancy in the matter, but if the style had only lasted a few years longer it would in all probability have developed some system which would have set this right; unfortunately (from the point of view which we are now taking) it only lasted some sixty years, and the attempt to unite the two forms of arch was abandoned, at least in France and England. Now comes a question, and one worthy of our attention. Would it be possible to take up this Transitional style and attempt to develop it, either as a round-arched style or as a style using both forms of arch consistently? The great difficulty at the present day in doing anything original in architecture is that all styles have been so fully developed that there is nothing further to be got out of them. They are like Australian tinned meats, which are already so much cooked that any attempt to warm them up again only ends in making them tasteless and insipid. But with regard to the Transitional style, it never became thoroughly developed, and if it were revived there is a possibility that it might lead to something. One thing seems to us to be certain, and that is, that any style of architecture which is to become largely in use must include so valuable a form of arch as the semicircular, as it is the most useful and most convenient of all arches. It is by no means improbable that the exclusion of this form of arch from Gothic architecture was the weak point in that style, and may have been the reason that it lasted for such a short period.

It would be well if our architectural students would make careful sketches of every example of the use of the round arch in Gothic buildings. There can be no doubt that numerous examples are to be found, which are at present little known. They would be then able to judge whether the examples are sufficient to warrant the experiment of trying to work out a style from them. There is a good deal of round-arched Gothic work in Spain and Portugal, but it seems mostly of a very late character. Earlier examples might, however, be found in parts of those countries which are less known. We do not, of course, mean to be understood that these examples would of themselves constitute a new style, but they might help to develop one. It is, of course, possible that we are incapable at the present day of forming a new style of architecture, or that the unfortunate rage for cheap work may be destructive of all true art in building. Let us, however, hope that this may not be the case, and that architecture, which has produced such glorious works in the past, may be destined to an equally glorious future.

REFERENCES.

Fig. I. Doorway, Liebfrauenkirch, Treves.
II. Cloisters, Treves.
III. Baptistery, Pisa.
IV. Gallery, Ratisbon Cathedral.
V. Brick arcade-work, Brandenburg.
VI. Chapel of Castle Trausnichts, Landshut.
VII. Town-hall, Cologne.
VIII. Rood Screen, Münster Cathedral.
IX. Town-hall, Freiburg-in-Breisgau.

THE BREWERY, ALDERSHOTT.

These premises have been recently completed at Aldershott, now the largest and most important military station in the United Kingdom, the War Department having decided to replace the present wooden huts with substantial brick buildings in the North and South Camps.

The tower contains the various working floors where the operation of brewing is carried on on the gravitation system, by which method a maximum result is obtained with a minimum of labour, both mechanical and manual.

In one wing are the offices, boiler and engine rooms, with malt-store, &c., above, cask-cleaning shed and cooperage. In the other wing are the racking-rooms, hop-store, cellarage, cart-sheds and stables, &c. The fermenting-squares and coolers are built in glazed white brick externally, and lined with Portland cement internally, rubbed to a highly-polished surface. The present plant is a ten-quarter set, with ample space for extension. The floors of the racking-rooms, stores, &c., are laid with Staffordshire paving bricks. The external walls are faced with red bricks; the piers between the panels having bold moulded angles; the heads and sills of windows and doors being of fine Portland cement.

The machinery is all furnished with the latest improvements, and is by Messrs. Coneybeare, of Greenwich, and Messrs. Morton, of Burton-on-Trent. The whole of the works were carried out by the well-known firm of Government contractors, Messrs. Martin, Wells, & Co., Aldershott, for Mr. Thos. Sheldrake, Ipswich. Mr. J. St. C. Mulley, of Aldershott, was the architect.

Architectural Association.—The President and Committee of the Architectural Association have issued cards for the opening *conversazione* of Session 1882-83, which is to be held on the evening of Friday next, the 27th inst.

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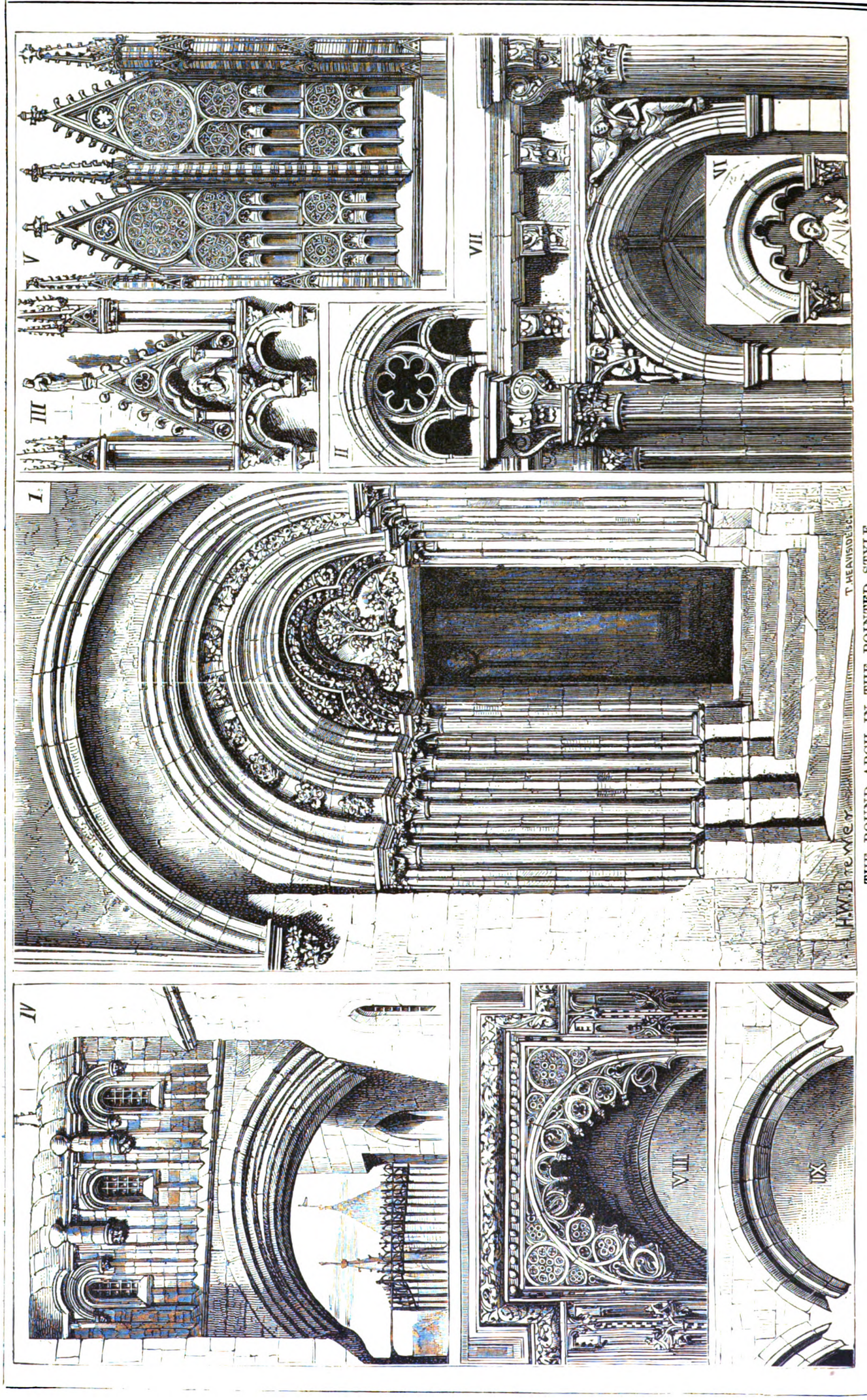

THE ROUND ARCH IN THE POINTED STYLE.

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Whiteman & Bass Photo-Litho 230 High Holborn

NEW BREWERY PREMISES - ALDERSHOTT

J. St C. Mulley - Architect
Aldershott.

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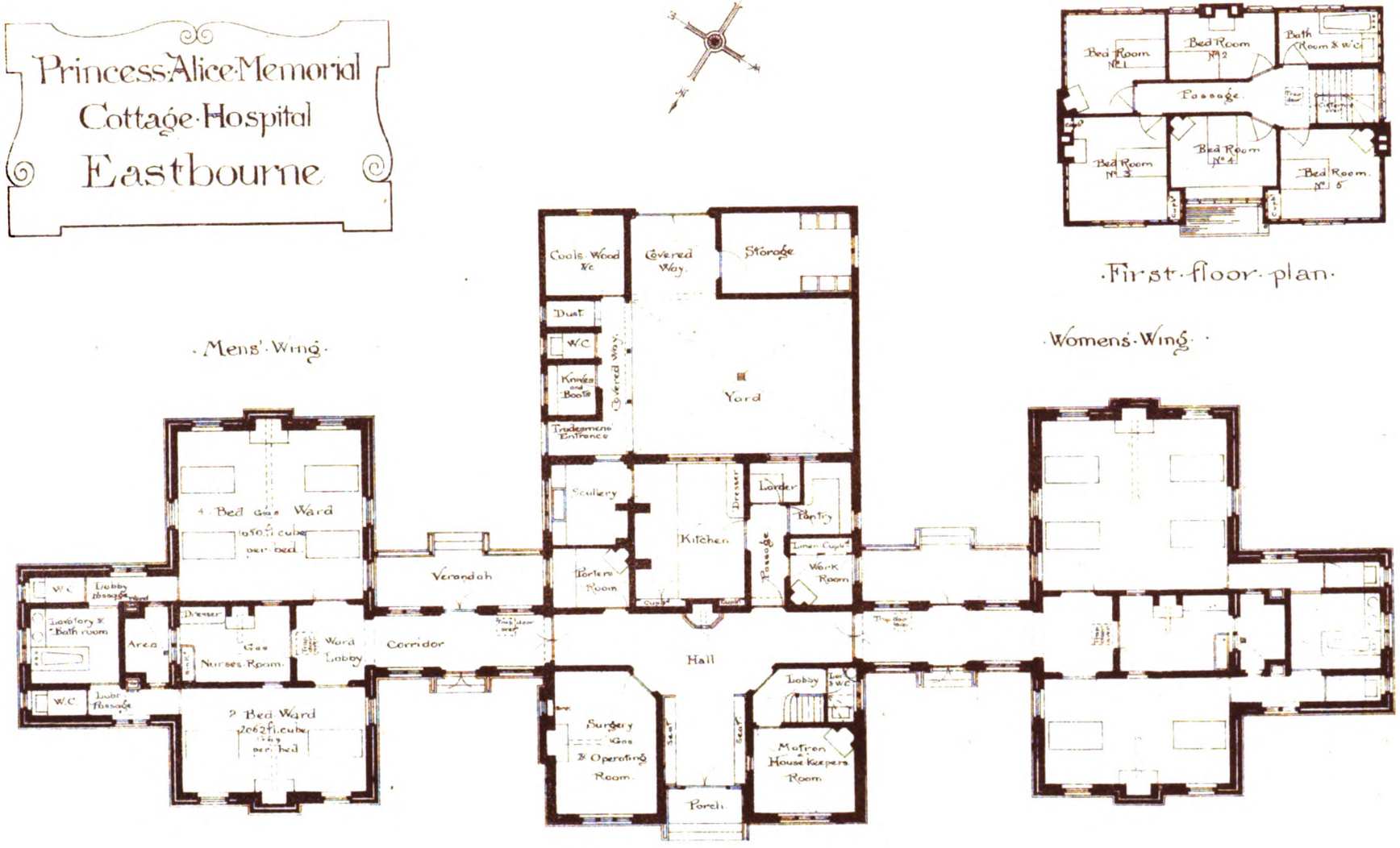
Princess Alice Memorial Cottage Hospital Eastbourne



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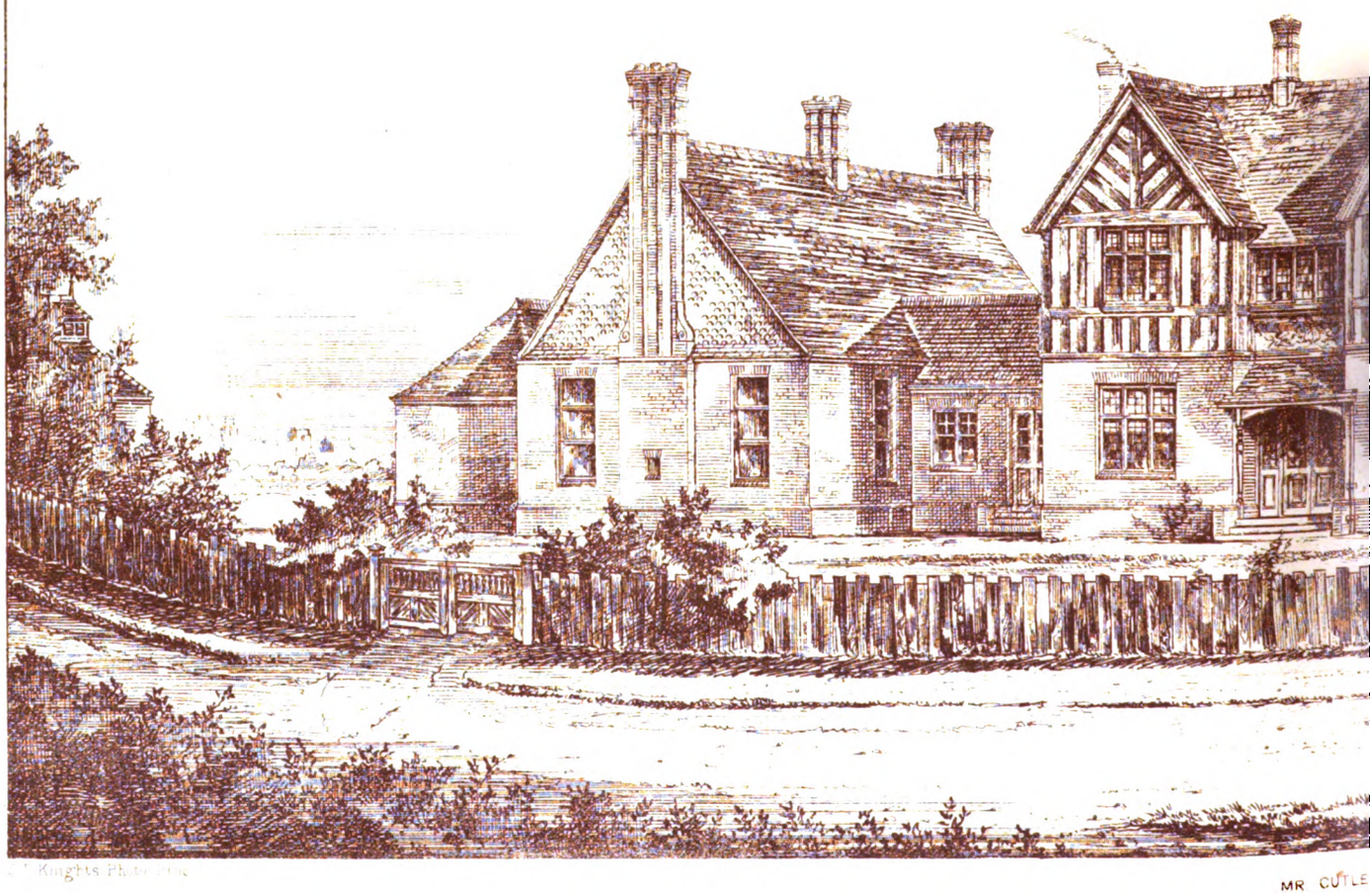
Princess Alice Memorial Cottage Hospital Eastbourne



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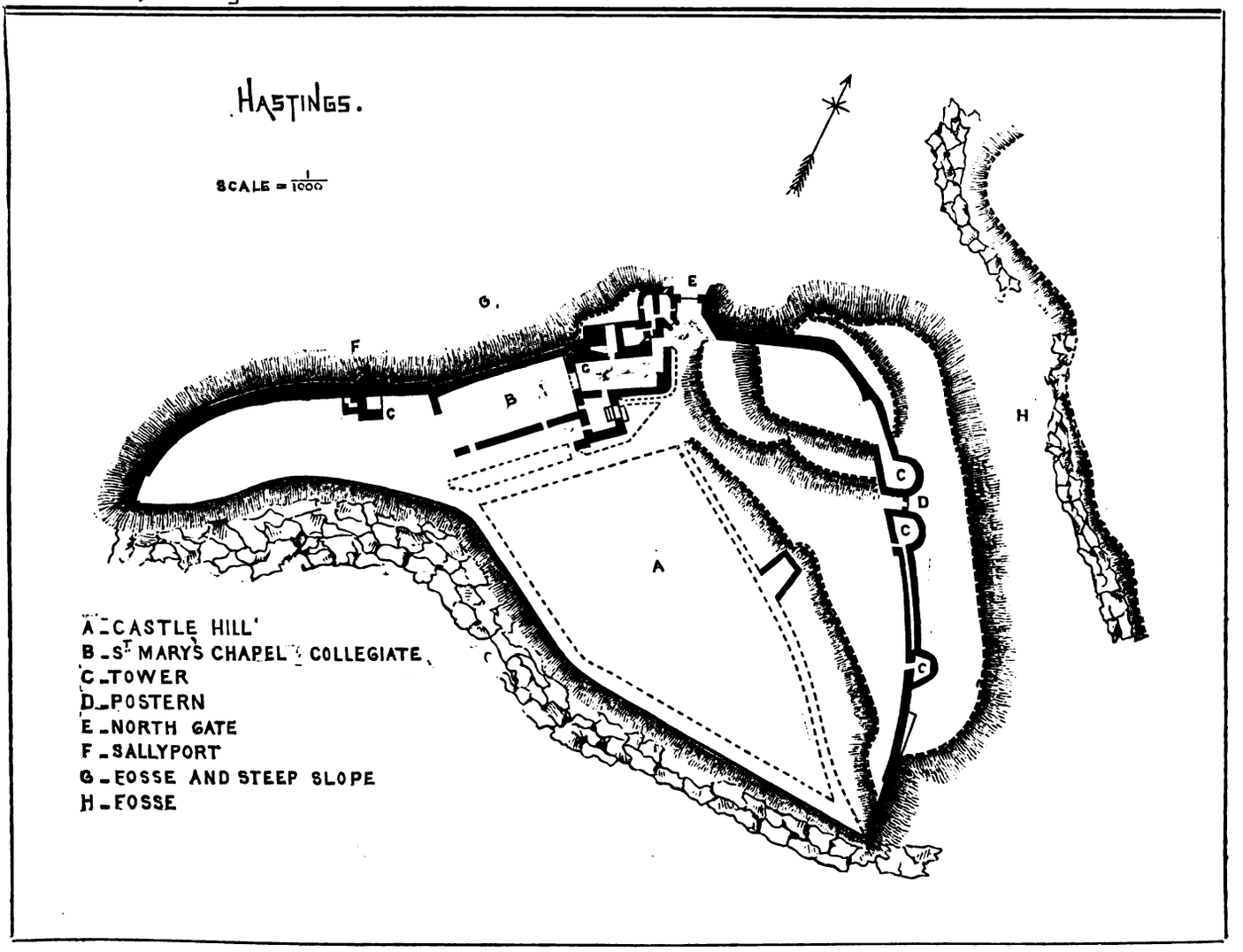

PRINCESS ALICE MEMORIAL HOSPITAL.

On the death of H.R.H. the late Princess Alice, it was decided by the inhabitants of Eastbourne to erect an hospital as a memorial of her, her Royal Highness during her lengthened visit to Eastbourne in 1878 having made herself much beloved by her kindly acts and gracious manners.

The hospital is being built on a site close to the railway station, which was given by Mr. C. D. Gilbert. The subsoil is chalk; and the main building is faced with red bricks. The roofs are covered with brown Broseley tiles. The upper floor of administrative block will be half-timbered. The walls are built hollow, and lined inside water-closets, bath-rooms, lavatories, &c., with glazed bricks. The floors of the wards are to be laid with oak in narrow widths, and wax-polished.

No skirtings or mouldings will be set up to collect dust or dirt. All internal woodwork is to be varnished. All baths, sinks, lavatory basins, and so on, are to be of white glazed pottery in one piece. All sinks, lavatories, &c., are to be free from inclosed framing, to insure cleanliness.

The grates in the wards are to be Galton's ventilating grates for the supply of warmed fresh air. The ward flues are to be swept from the outside of the building.

Natural ventilation is to be effected by window-sashes, glazed with plate glass, divided into three compartments, the bottom and middle sashes to be hung so as to be raised or lowered any height as required, the top sash hinged to fall inwards, with glass hopper sides to admit fresh air without draught. Fresh-air inlets will be carried under every bed in the wards, to be opened or shut as required. The gas lights are to be enclosed in locked globes, so that all fumes may be carried direct into the ventilating-flue. Ventilating-flues (for exit of vitiated air), heated by gas, and smoke flues, are provided to all rooms. Fresh air will be admitted to the back of the fire-grates, warmed, and supplied to the wards, surgery, and matron's room. Slop-sinks, lavatories, baths, and water-closets are disconnected from the wards by cross-ventilated lobbies. The wards are detached from the administrative department by cross-ventilated corridors. All the drains are carried direct to the outside of the building, and flushed at the two highest points by Field's flushing-tanks, and ventilated by fresh-air shafts near the entrance to the sewer, and ventilating-pipes on the highest points.

The foundation-stone was laid by H.R.H. Princess Christian of Schleswig-Holstein, Princess Helena of Great Britain and Ireland, on the 5th of July last.

The hospital, without detached mortuary, will cost about 5,000*l*., and is being built with funds raised by voluntary contributions. The success of the movement is greatly indebted to the personal exertions of the Rev. Canon Whelpton, chairman; Mr. G. Gurney, hon. treasurer; and Mr. J. H. Campion Coles, hon. secretary of the committee.

The building is being erected by Mr. Gregar, Victoria Wharf, Stratford; Mr. W. Slack is clerk of works, and the architect is Mr. Thos. W. Cutler.

Liverpool Engineering Society.—At the meeting of this Society, at the Royal Institution, Colquitt-street, on Wednesday evening, the 11th inst., Mr. F. B. Salmon, president, in the chair, a paper on "Some recent Progress in Electrical Engineering" was read by Mr. J. S. Brodie, M. Inst. M.E., of the City Engineers' Department. The paper described leading types of dynamo-electric generators, including those of Siemens, Gramme, Brush, and Lactraussée, discussing the merits and comparative efficiency of each for the production of electric currents. The secondary batteries of Planté, Faure, and De Meritens were next illustrated and described. Passing to the subject of the electrical transmission of power, the electrical railways of Siemens, at the Paris Exhibition, was explained and illustrated by diagrams. An interesting discussion followed. We understand that a supplement to the paper, on "Electric Lighting," will be read at the next meeting of the Society, on the 25th inst., by Mr. Brodie.

HASTINGS CASTLE.

The Rape of Hastings is the most eastern of the six divisions of the county of Sussex, which are supposed to derive their somewhat peculiar name from the early occupation of the district by emigrants from Jutland. The Rape of Hastings probably is so called from its principal town, which was also the seat of its lords, both before and after the Norman conquest. Like the other Rapes, it had its river and its forest, its castle and its castelry, often designated as an Honour. The river, the Rother, is the common boundary of Kent and Sussex, and joins the sea at Rye. The forest, long since disafforested and enclosed, is represented by frequent patches of woodland, scattered over the least fertile parts of the district, and by the numerous and well-timbered parks by which it is characterised. The town once possessed a small port, now silted up. It was situate at the mouth of a stream, which still brings down its inconsiderable tribute, flowing at the foot and to the west of the castle hill.

The origin and etymology of the name of Hastings are lost in obscurity. It is so uncommon that it has been supposed to come from Haesten, the celebrated pirate and Danish Viking, who infested the southern coasts of England and the valley of the Seine in the ninth century,—a period when warriors of Northern descent gave their names to their possessions, instead of, like their descendants of two centuries later, reversing the practice. Mr. Lower, familiar with Sussex topography, has suggested that the small stream of the Asten, a few miles west of Hastings, may play some part in its etymology, and that Hasting, or the Haesten-Ceaster of the English, may have stood upon its margin. It has also been regarded as the seat of the Hastinges, a tribe said to have been warred upon by Offa of Mercia in 792. Another not less interesting point connected with the place is the fact that it gave name to the ancient family who so long ago bore the title of Pembroke, and still bear that of Huntingdon.

The castle occupies the narrow, acute, and

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very steep extremity of a ridge of chalk, which here terminates abruptly to the seaward at a height of about 180 ft. above the seashore, and seems intended by Nature for a defensive position. The ridge is a spur from a range of larger and more elevated character, which extends from the high ground of Battle, by Ore, south-eastwards to the sea, and has to its west and south a large tract of broken and highly fertile picturesque land known as the hop garden of Sussex, and within which are the well-known seats of Hurstmonceaux, Ashburnham, Battle, and Crowhurst,—a tract which presents to the sea an open frontier of about twenty-two miles from Hastings to the Marsh of Pevensey, defended anciently by the two castles of those names, and more recently by twenty or thirty martello towers, in which our fathers, three-quarters of a century ago, placed an expensive confidence.

The ridge and promontory of Hastings remain unincumbered by modern buildings, and are occupied only by the castle and its outworks. The older part of the town, with its two parish churches of St. Clement and All Saints, occupies a deep valley to the east of the castle, while round the nose of the rock, and to its west, the remains of the old port have been superseded by the new town, a fashionable watering-place. Much of this town stands within the parish of St. Mary de Castro, the parish church having been the chapel of the castle, and collegiate. The town seems to have been partially walled, and certainly had four gates. Hastings, though now affording no accommodation for shipping, is still a cinque port, and its ancient consideration is attested by the fact that in 1229, Seaford, Pevensey, Bulverhythe, Hidney, Iham, Beaksbourne, Greenhythe, Northeye, were its subordinate members, and *tanquam membra*, were Rye and Winchelsea.

The castle is composed of two wards, separated by a formidable ditch cut through the sandstone rock, about 400 ft., across the ridge, with a breadth of 60 ft., and to a depth of 30 ft. to 40 ft. The inner ward lies to the west of this ditch, between it and the point of the promontory. The outer ward lies to its east, and is again protected by an outer and considerable, though less clearly-defined, ditch, of greater length than the former, and also crossing the ridge. There was also another ditch cut as a sort of step in the steep northern slope, and covering that side of the place, and chiefly intended for the defences of the inner ward. Between the east end of this ditch and the north end of the great cross ditch was the original entrance to the inner ward, the approach to which wound up the steep north-western slope of the rock.

The inner ward is in figure nearly a right-angled triangle, containing about 1½ acre, the north side 154 yards and the east side 87 yards in length, while the hypothenuse is concave, reducing the breadth of the ward at one point to 16 yards. The cliff which forms the boundary has been either scarped or has fallen away, so that it is at present precipitous, and its face has been patched with modern masonry and brickwork. It is said that this side was once straight, and has been cut away to make room for the gasworks and a crescent of houses below, so as to diminish the castle area. This may be so, but the encroachment cannot have been considerable. A wall for defence on this front could never have been needed: probably there was only a low parapet.

Along the north front the ground, though very steep, is not absolutely precipitous, and along the crest of the slope are the remains of the curtain wall, about 6 ft. to 9 ft. thick, and in parts 20 ft. to 30 ft. high. Upon this wall is a rectangular tower, about 12 ft. by 20 ft., having a ground and upper floors in which are parts of three windows of Norman date. Connected with this tower are said to be traces of a small postern, and there is certainly a mural passage, 18 ft. long, ending in a garderobe. East of this tower is a turret, square at the base, but which above seems to have been cylindrical. It contains a well-stair connected with the chapel. The wall is continued round the east front, across to the cliff. At the angle it is still 20 ft. to 25 ft. high, but further on it has been reduced to 10 ft. In this front, overlooking the ditch, are the bases of three half-round buttress towers, 20 ft. diameter. Their ground-floors have been vaulted in; all above is removed. Between the two most northern of these are still to be seen the jambs of an Edwardian gateway, of 9 ft. opening, with a square portcullis groove, and rebates for a door immediately behind it. In this part of the curtain are the remains of some mural cells. The gateway must have communicated with the outer ward by a bridge across the ditch, probably of timber, since there is no trace of masonry in the rock. This entrance is now disused, and the entrance in use is in the north side between the chapel tower and the north-east angle, protected by a late tower, about 20 ft. square, with very slight walls and a flanking wall, also slight, and projecting about 20 ft. This is thought to have been the original gateway of the ward, and may have been so, though the other entrance between the two flanking half-round towers has at present more the aspect of a main entrance.

The eastern, naturally the weakest side of the inner ward, is further defended by a broad artificial bank or ramp of earth from 20 ft. to 30 ft. broad and 8 ft. to 10 ft. high, piled up against the back of the wall, which, in fact, is a revetment. At the north-east angle of the ward this bank is expanded into a mound about 20 ft. high above the inner area. The curtain traverses this mound, of which about two-thirds is within its circuit.

No doubt this mound was the keep of the English fortress, and the bank and ditch its main landward defences, but, save the curtain, there is no trace of any masonry upon it, nor does the Norman castle appear to have been provided with any regular keep, either shell or rectangular. Probably, as at Exeter, the whole inner ward was the keep.

There are at present no traces of a hall, kitchen, or regular lodgings, within the castle, but placed against the north wall are the remains of the chapel, or rather of the free collegiate church, composed of a nave and chancel. The nave was 30 ft. by 64 ft., the curtain forming the north wall. There seem to have been a west door, and one or perhaps two south doors. At its east end a handsome highly-pointed arch opened into the chancel, and still remains very perfect. The jambs are square, the angles replaced by delicate shafts, a quarter engaged, with caps and bases of Norman type. The abacus is part of a moulded string, and the arch, though the section is square, as in the Norman style, is richly moulded. The central member of the arch is a bold rib, springing from two brackets or corbels carved in foliage. The general character of the whole is very late Norman, passing into Early English. In the north wall, at its east end, are the remains of the arches of three sedilia, and near the middle of the wall, in a sort of buttress, is a piscina, probably a Perpendicular insertion. Near the north-west angle is the cylindrical base of the font. In the east wall, on each side of the chancel arch, is a flat-topped doorway of rude workmanship, as though intended to be concealed by hangings, The northern door opens into the well-stair of the turret, the southern into a vestry.

The chancel was about 18 ft. broad by 28 ft. long. Of its walls only a few traces remain. It communicated on the north side with a small chamber, perhaps a garderobe, and on the south side with the vestry. The vestry, called also the chapter-house, is a small, nearly square chamber, 12 ft. by 15 ft., with a plain Norman recess in its east wall, and the jambs of a door, evidently Norman, opening into what seems to have been a sort of lean-to cloister resting on the south wall of the nave. The cloister itself is gone, but in the nave wall are traces of an arcade. Here are three graves inclosed in pieces of stone placed edgeways, and a much-worn dos-d'âne coffin-lid. The breadth of the nave is wide for a single span, but if there were aisles, there must have been two, the arches being central, and in that case very narrow ones, even for a Norman church. The floor of the chancel is three steps above that of the nave.

The curtain wall along the north front and over the mound is apparently of Norman date, as is most of the east wall; but its buttress-towers and the gateway are probably insertions of the reign of Henry III. or Edward. The chapel may be later than the north wall, probably of the reign of Henry II. or John.

The old part of the masonry is coursed rubble, with occasional pebble-stones, faced with bold open-jointed ashlar, the blocks being rudely dressed. In one part, near the church, is a little herring-bone work, though probably not older than, if so old as, the rest. The quoins and window-dressings, where preserved, are good ashlar. Various fragments of cut stone are collected and heaped up; of these a few are late Norman, some good Early English, some Perpendicular. A late Norman crypt has been discovered in the town.

It may be doubted whether William or his feudatories, the Earl of Eu or de Tilliol, added defences in masonry to the works already existing. At least there is no evidence that they did so, and the oldest masonry now seen is certainly not very early Norman, though too early to have allowed time for the decay of any previous masonry of the same architectural period.

The chapel was probably founded in the reign of Henry I., and though the castle was erected by, and for some time held, under the Crown, by the powerful Earls of Eu, it was never a great baronial residence, being in that respect far inferior to Arundel or Lewes, but was probably maintained only as a strong though small post to cover embarcations for, or disembarcation from, Normandy.

The outer ward is contained between the inner and outer lines of ditch; within the latter is a considerable bank of earth, which rises at the north-east angle, and is continued across the northern end, that being naturally the weakest part of the inclosure. It does not appear where was the entrance of this ward, but possibly near the south-east angle. There are no traces of masonry here, so that the defences of the outer ward may have been a stockade only.

From the position of this fortress it is most probable that, like Dover, it may originally have been a British work, the entrenchments including the promontory, and the south ditches being the defences landward. The mound, however, placed at an angle of the inner ward, upon the bank, and covering the approach, is almost certainly a later, and, no doubt, an English work.

Whatever may be the origin of Hastings as a defensive work, its known history commences towards the end of the sixth and the beginning of the eighth centuries in the times of Offa and Athelstane, when it was a place of some consequence, and contained a mint. Coins, indeed, were minted here as late as the reign of Henry I.

The termination, "ceaster," which it then bore, shows it to have been fortified. Towards the middle of the eleventh century it was plundered by the Danes, and towards the middle of that century it was the men of Hastings who, after the murder of Beorn by Swegen, captured his ships, and slew his accomplices in the murder, though Swegen himself escaped. Hastings also played a part in the Norman Conquest, though not that popularly assigned to it as the scene of the battle. William landed at Pevensey, and thence moved rapidly to Hastings in search of food. There Odo of Bayeux, as one of his lieutenants, ordered a fortress to be thrown up "ut foderetur castellum," and thence, according to the same authority, the Bayeux tapestry, William marched against Harold. William, we are told, on reaching the port, selected a proper site, and fortified it rapidly with a castle in timber, "ligneum castellum." This, we must suppose to be a replacing or restoration of whatever there was standing on the old site. It can scarcely have been a palisade on the low ground below the castle rock. He then placed Humphrey de Tilliol, brother-in-law of Hugh de Grantmaisnil, to discharge his orders, "qui Hastinges a prima die constructionis ad custodiendum susceperat." Wace's description applies more to Hastings than to Pevensey, which was already walled in:—

> "Un chastel i ont fermé
> De bretesches è de fossé."

De Tilliol's occupation was confined to the construction or restoration of the defences: the castle and castelry, manor, and superiority of the whole Rape were granted by William to Robert Earl of Eu, one of the most powerful of his Norman adherents. This grant of the castelry is recorded in Domesday, and a castelry involves the existence of a castle. The Earls of Eu held possession for five generations in the male line. No doubt, either Earl William, who succeeded in 1090, or Earl Henry, who died 1139, executed some works in masonry at the castle,—probably the wall of the *enceinte*, much of which still remains. Either the first or second earls founded within the castle a free chapel

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and college, with a dean and secular canons, and to this Henry, the third earl, added a considerable endowment by charter in the reign of Henry I. The college survived the castle, and flourished when the latter was a ruin. Thomas à Becket held the deanery, and William of Wykeham one of the prebends. The college endured to the 38 Henry VIII., when it was dissolved, and the property alienated to Sir Anthony Brown. After the extinction of the Eu barony the patronage vested in the Crown. The charter of Earl Henry is recited in a confirmation, 22 Edward I.

In 1088 the castle probably had been made strong, for it was the boast of William of St. Calais, Bishop of Durham, that he secured Hastings for William Rufus. It was the place of muster for the powerful military force with which that king proposed to invade Normandy. At that time Anselm and many bishops and barons were present in and about the castle, and were detained there from Candlemas in 1094 for six weeks by contrary winds, during which time the king was present at the completion and consecration of his father's Abbey of Battle. Immediately afterwards Robert Bloet was consecrated bishop of Lincoln within the chapel of the castle, and here also Bishop Herbert of Thetford was deprived of his see. It was in the castle of Hastings also, on this occasion, that Rufus once more refused attention to the reasonable remonstrances of Anselm, who left him unblessed to depart on his Norman expedition. The Earls of Eu, by no means always faithful vassals of the Crown of England, seem latterly to have neglected the castle, which was inferior to Pevensey as a muster-place for troops, and had become of but moderate value. Henry, the fifth earl, who died in the reign of Richard I., left an only daughter, Alice, who married Ralph de Essoudun, who in her right became Earl of Eu, and so died in 1211. Their son, William, elected to become a subject of France, and, 29 Hen. III., his possessions in England escheated to the Crown, and were granted to Prince Edward. As early as 1227 King Henry allowed to Robert de Aubeville 10 marcs, half his salary, as keeper of the castle. The college was retained by Henry in his own hands. In 5 Edward III. the dean and canons petitioned to have the castle wall restored, it having been injured by the sea. In 1372 the castle was granted to John of Gaunt, and in the reign of Richard II., it was a ruin, and probably so remained. The Early English work, especially connected with the chapel, was probably executed by Henry III. on his acquisition of the barony.

By Henry IV. the castle was granted to Rafe Neville, Earl of Westmoreland, with reversion to Sir John Pelham, who again transferred it, in 1412, to Sir Thomas Hoo, created Baron Hoo and Hastings in 1447. He died without issue male about 1453. The feoffees of Sir Thomas sold the castle and other property, in 1461, to Sir William Hastings, who in that year was summoned to Parliament as Lord Hastings of Hastings. By his descendant, Henry, Earl of Huntingdon, the castle and its appendages were sold, in 1591, to Sir Thomas Pelham, in whose descendant, now Earl of Chichester, they remain vested. Those who wish to understand thoroughly the position of Hastings as regards the landing, first movements, and subsequent advance of Duke William upon English soil, will do well to consult the very lucid and quite original account of the battle of Senlac, given in Mr. Freeman's "History of the Conquest." G. T. C.

SYNAGOGUES.

A CORRESPONDENT inquired in our columns a few weeks ago (*ante*, p. 446) whether there is any synagogue in Europe with a spire to it. The *Jewish Chronicle*, quoting the inquiry, adds, "We believe there is not any." We hope this inquiry will be carried further.

British Archæological Association.—We understand the London excursion of the local members of the British Archæological Association has been definitely fixed for October 27th, 28th, 29th, 30th, and 31st,—Friday to Tuesday inclusive. Arrangements are in progress for visiting Heralds' College, Eton College, Windsor Castle, new discoveries at the Tower, Waltham Abbey, Greenwich and Eltham Palaces, &c.

A YEAR'S BUILDING OPERATIONS IN OXFORD.

IN accordance with its custom at the commencement of the Michaelmas term, the *Oxford Journal* gives a description of the new collegiate and other buildings which have been in course of erection or alteration during the past twelve months. From this account we extract and condense the following details:—

The Divinity Schools.—This fine pile of buildings,—including Bodley's Library,—has been undergoing thorough restoration during the last five or six years, at a cost defrayed by the curators of the University chest, under the direction of M. T. G. Jackson, architect, Devereux-court, Temple, London. The library, round which the schools are grouped, was finished by the donor in 1598, and formally opened in 1602. Bodley himself died ten years afterwards, and was buried in Merton Chapel. About this time the schools were begun, Thomas Holt, a native of York, being the architect, and he was at his death interred in Holywell Cemetery, where so many notable men connected with the University have been buried. To Holt belongs the honour, if honour it may be called, of having introduced the Classical orders of architecture in a series over each other in the same building. The central tower of the schools is the most famous, if not a unique, specimen of this kind of work in England, and this prominent object has just been restored in a very complete and careful manner. The stone with which it was originally built was from the Headington Quarries. Some sixty or seventy years ago a partial patching up was necessary, owing to the decay of the stone. Roman cement was then used, in the hope that the decaying finger of time might be arrested; but cement and stone have continued to crumble and fall together, especially in wet and frosty weather, in such a manner as to render the structure highly unsafe. The tower, from the pavement to the top of the angle pinnacles, is 110 ft. high, or to the top of the octagon turret, 117 ft. Its width, from east to west, is 31 ft., and from north to south, 6 in. less; so that it is nearly square. The west front is the most important, composed as it is of the five orders of architecture, with Elizabethan ornamentation, the columns rising above each other in pairs on either side. This has now been completely repaired, and as Clipsham stone has been used for the purpose, it is hoped that the weather will have little effect upon the new work. Every detail of the old structure has been minutely copied, stone for stone, and wherever it was possible the work of the former restorer has been retained. This has been rendered still the more easy from the fact that Bath stone was used in those portions of the work which have been allowed to stand. The parts untouched consist of six columns on the south side of the west front, a portion of the cornice of the upper order, the parapet and pinnacles. The masonry is solidly laid in Portland cement. The old stained glass and the oriel windows on the east front have been restored and re-leaded by Messrs. Powell & Sons, Whitefriars, London, the subjects being chiefly Scriptural. A curious discovery was made near the canopy over the statue of James I. in the course of the demolition. A window, similar to those above and below, evidently occupied the site of the existing group of figures previously to their being placed *in situ*. Part of the inside arch and jambs were left undisturbed. Lightning-conductors have been fixed to all prominent points, as well as over the rest of the building, by Messrs. Newall & Co., of London. The east front of the tower has also been carefully restored. The splendid oriel window lighting two floors, and which is 39 ft. high and over 10 ft. wide, is divided by mullions and transoms, and, besides the tracery panelling, there is much carved work in the several stages. In the upper part of the window the old stained glass has been restored, as have the two transom windows above. In the parapet between the angle pinnacles are built intermediate pinnacles, according to the original design, and half pinnacles answering to those on the west front form buttresses at the north-east and south-west corners. The arches over the upper windows are strengthened by wrought-iron rods; ornamental fleurs-de-lis are placed in the parapet coping; and the remainder of the tower is strengthened with iron tie-rods passing through both walls, and secured with nuts and plates. The windows on either side of the tower have been replaced according to the original design. The restoration of this chief feature has occupied just over a year, and has cost over 6,000*l*. Mr. Burgess has been clerk of the works. The carving was done by Mr. M'Culloch, Kennington-road, London; and the general contractors were Messrs. Symm & Co., of Oxford.

The New University Schools.—We some time ago published a description of these schools, of which also Mr. Jackson is the architect. The principal features which remain to be noticed are the lighting arrangements, and the carving work which is now being executed in the front. The former have been carried out by Messrs. Hart, Son, Peard, & Co., of Wych-street, London. The gaseliers which light the great hall and the west ante-room have been reproduced from Flemish examples. In the writing-schools and north-west and south-west halls there are simpler pendants, designed in the feeling of the Flemish chandeliers. The panels on each side of the principal entrance are now being carved, and represent a *viva voce* examination for a degree on the one side, and the conferment of a degree on the other.

Brasenose College.—The buildings in course of erection at this college will take the place of two slightly-built and not-well-planned constructions, now standing in the kitchen or cloister quadrangle. By their removal, and that of some cottages and outbuildings, a spacious quadrangle, bounded on the east by the ante-chapel and cloisters, and on the west by the new wing, which is set a good way back, will be formed in the place of the present confined and irregular space. To the south, the new quadrangle is only separated from High-street by the houses and shops facing that street, and the buildings now being erected form part of a scheme for a quadrangle which will extend the whole distance from the old Brasenose buildings to High-street, and add one more to the series of collegiate and academical buildings with which that street is lined. The building will contain twenty-two sets of rooms for undergraduates, two large lecture-rooms, and a spacious set of rooms for a Fellow. The old collegiate plan of disposing the rooms on separate staircases had been followed, but various conveniences in the way of sculleries and servants' offices are provided, which were unknown or disregarded when the older college buildings were designed. The foundations are laid at a depth varying from 14 ft. to 20 ft., that being the depth of the "made" or artificial earth for the most part within the ancient limits of the city. In the soil that has been removed at Brasenose, a great variety of relics of the past were found, consisting chiefly of pottery, coins of no great value, old knives, wig-curlers, and tobacco-pipes, some of which date from the introduction of tobacco. In order to gain space enough for the new building it was necessary to demolish the greater part of Amsterdam Court, which occupied the site, and preserved the name of Amsterdam or Broadgates Hall, one of the numerous academical halls with which Oxford abounded during the Middle Ages, and especially before the existence of colleges. The walling of the new building is of Headington rubble, faced with Gibraltar rag-stone, with dressings of Clipsham stone for strings, cills, weatherings, and mullions, and hard Doulting for the rest. Flagstone from Castlehill, near Thurso, will be used for the landings, and the stairs will be of hard Portland. The foundations and the walls, to the height of about 3 ft. above ground, were put in by workmen under Mr. Mockford, the clerk of works. The contract for the building above this level has been let to Messrs. Symm & Co., of Oxford, who have carried the buildings almost to the roof.

Lincoln College.—The new buildings here form the north side of the space of ground known as The Grove, at Lincoln College, bounded on the west by the older quadrangle of that college, and on the east by the back of Brasenose College. They replace the old "Grove buildings," which contained eleven sets of small and inconvenient rooms, and which, although only built in 1759, had suffered so much from the action of the weather on the perishable local stone of which they were constructed as to have become dilapidated. The new building, now approaching completion, is designed by Mr. T. G. Jackson, and contains fifteen sets of rooms for undergraduates, and one set for a Fellow, besides making provision for some of the servants' offices. The depth to which it was necessary to go in order to secure

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a sound foundation has given opportunity for an extensive basement, which serves partly for cellarage and partly for sculleries and servants' offices, a convenience unknown to the economy of older collegiate buildings. The basement contains also a new larder, reached by a subway from the college kitchen. The south front is faced with Handborough stone, and the north is of red brick, coursed with ashlar, the dressings throughout being of Clipsham stone. The stairs are of Portland, with landings of the extremely hard Castlehill flags from Caithness. In forming the subway from the kitchen, which is part of the original college buildings of about 1436, it was found that the foundations were about 17 ft. deep, although the ground had apparently been very little, if at all, raised since the building was erected, the floor being still at the ground-level. In joining the new building to the college hall, it was necessary to open one of the hall windows which had been blocked on the outside with masonry, and concealed on the inside by the panelling erected by Lord Crewe in 1701, at which time, probably, the other hall windows were converted into the present plain square sashed openings. On opening this blocked window the original tracery was found behind it so complete that the whole of the design could be accurately recovered. The foundations and basement up to the ground-level were put in by workmen under Mr. Mockford, the clerk of the works. The contractor for the superstructure is Mr. Estcourt, of Gloucester.

New College.—Extensive alterations have been in progress at this college in re-modelling and re-organising the kitchen wing and its various offices. The original kitchen of William of Wykeham's foundation must have been a lofty and spacious apartment, but subsequent alterations and clumsy fittings, which may, perhaps, have been convenient in their day, sadly marred its proportions. The kitchen has now been restored to its probable former size. An entirely new system of cooking apparatus, with steam and hot-water services, has been fitted up by Messrs. Jeakes & Co. The old larders and other offices have been replaced by substantial new buildings. The builder's work is being executed by Mr. Holland, Hurst-street, under the superintendence of Messrs. Wilkinson & Moore, architects.

Magdalen College.—Great progress has been made with the new buildings for this college, the roof rafters having been fixed. The work consists of thirty sets of rooms, with lecture-room, and Fellows' chambers, and the style, to be in keeping with the remainder of the college buildings, is Late Perpendicular. The front stands about 200 ft. in length in the High-street, and the west wing goes to a length of 114 ft. northwards. The oriel windows in the east and west ends of the High-street front constitute prominent architectural features in the building, and in the spacious lecture-room the panels are richly carved with representations of lilies and Tudor roses. The stone which has been used is Headington and Taynton, and the gurgoyles are of Ancaster stone. The tower, which will harmonise with that of the founder, will rise to a height of 80 ft., beside the pinnacles. The architects are Messrs. Bodley & Garner, of London. Messrs. Franklin & Son, of Deddington, are the builders; and the carving has been executed by Mr. McCulloch, of London. Mr. Fitzwilliam is the clerk of works. Sundry improvements and restorative works have been carried out at this college by Mr. George Castle and Messrs. Knowles & Son, and where any architectural features were interfered with the designs were furnished by Messrs. Wilkinson & Moore.

Keble College.—Further works of extension have been carried out at this college, and they are in a style corresponding with that of the rest of the buildings, namely red brick with Bath stone dressings. The additions comprise a bursary, steward's office, over both of which is a lecture-room, 39 ft. in length by 26 ft. in width, and twenty sets of rooms for undergraduates, together with the necessary offices. The new buildings extend 131 ft. in length by 30 ft. in depth, and the lecture-room is approached by a flight of Derbyshire marble steps. Messrs. Parnell & Son, of Rugby, who have been entrusted with the construction of the rest of the college, are the builders, Mr. Butterfield being the architect. The work has been superintended by Mr. A. G. Cook as clerk of the works.

University College.—At this college, Messrs. Symm & Co. have restored several of the stone gables in the Radcliffe Quadrangle, which were found to be in a very dilapidated state. Taynton stone has been used. The same builders have also carried out extensive improvements in the drainage at Balliol, Merton, and Corpus colleges, and the Radcliffe Observatory, from the plans of Mr. Griffith, C.E.

The Indian Institute.—The work of pulling down the six old houses, excavating the ground, and laying the foundations of the building for the Indian Institute, the site of which is at the east end of Broad-street, has been accomplished by Messrs. G. Wyatt & Son, and the contract for the erection of the building has been undertaken by Messrs. J. R. Symm & Co., who have already commenced operations. The architect is Mr. Basil Champneys, and the style of the building will be that commonly known as Jacobean. The angle formed by the junction of Holywell-street with Broad-street will be occupied by a turret surmounted by a lantern, which will contain the staircase, leading to the basement below and to the library and museum above. On one side of this turret, facing Broad-street, will be the main entrance. The whole of the first and second floors towards Broad-street will be occupied by the library, which will, when completed, have a series of five oriel windows, while the upper floor will have the same number of smaller windows lighting the galleries. The front towards Holywell-street will be necessarily of irregular shape, and will be broken up into parts by two projecting features, which are intended to obviate the awkwardness of the site. The material throughout will be of Milton stone.

Radcliffe Infirmary.—A new entrance-lodge for this institution has been erected by Mr. Thomas Selby, builder, from the designs of Messrs. Wilkinson & Moore, architects.

Church of St. Peter-in-the-East.—An improvement has been effected in this church by the removal of the old pulpit, and the substitution for it of one of Caen stone, in the Byzantine style. The front is supported by four columns, and it is very richly moulded. The carving has been executed in a very excellent manner by Mr. McCulloch, of London, who also has had the charge of the stone screen under the chancel arch. New oak choir seats and desks have been placed in the chancel. An old piscina has been discovered in the south wall of the chancel, and is now exposed to view. Mr. Jackson has been the architect of the work, and Messrs. Symm & Co. the builders.

Wesleyan Mission Room, St. Clement's.—A large mission-room for the Wesleyans is now in course of erection at the end of William-street, Cowley-road, to seat 300 persons. The walls are being constructed with red bricks, the south and east fronts being faced with Garsington white bricks, relieved with Headington red bands and plinths. A row of semicircular-headed windows, in pairs, with beaded brick arches (with keys and chamfered jambs), will be in elevation next William-street, with bold doorway in harmony with the windows. The whole is being carried out in separate contracts for each trade from the plans and under the superintendence of Mr. J. C. Gray, architect.

Magdalen Bridge.—The work of widening this bridge was commenced in April, notwithstanding protests, since which time the abutments and piers in the north-western branch of the Cherwell have been built, the centres fixed, and the arches partly turned, and similar progress has been made with the small land arches adjoining. A large portion of the retaining-wall of the bridge has been erected in the meadow between the two branches of the river, and the space between it and the old work partially filled up. A dam has lately been placed across the south-eastern arm of the river and the water pumped out, and the piling and concreting for the foundations of the abutment-piers are now going on. To enable these works to be pushed forward with the greatest possible expedition a gas-lamp of 100-candle power has been suspended from each arch, so as to thoroughly light the works at night. The foundation of the curved wing walls, at either end, is also partly done. The main-surface water-drain from the High-street has been diverted, so as to discharge below the new part of the bridge, and the river-wall to the Botanical Gardens has been set back and rebuilt. In order to facilitate the passage of the river water through the bridge a temporary channel has been cut across the meadow, on the upper side of the bridge, so as to connect the two branches of the river. By an arrangement between the Local Board and the Thames Valley Drainage Commissioners, and in view of the river improvement works contemplated by the latter body, certain works,—agreed upon between Sir John Hawkshaw and the engineer to the Board,—have been carried out in the north-western branch, and will be likewise executed in the south-eastern branch of the river, so as to enable the river to be deepened to the extent recommended by Sir John Hawkshaw without endangering the foundations of the old part of the bridge, which have been discovered to be shallower and more unsatisfactory than was at first supposed.

New Hincksey.—A new street has been opened in this locality, leading out of Lake-street, by Mr. James Boffin, who has erected a row of nine houses, with bay windows to each, on one side, and he is at present erecting six on the other side, of a class suited to the requirements of the neighbourhood. The architect is Mr. J. C. Gray, 82, Cowley-road, Oxford, who also superintended the erection. In Cross-street, New Hincksey, the Wesleyans have erected a mission-room suited to this growing suburb of Oxford. The walls are constructed of red and white bricks, relieved with bands, and the roof is covered with blue slates. The seats and rostrum are of pitch-pine, stained and varnished. Mr. Gray was the architect.

New District Church for Cowley St. John.—Rapid progress is being made with the new district church for Cowley St. John. It is situated in the Cowley-road, in close proximity to the University Cricket-ground and National Hospital for Incurables. The style is Early Decorated, the walls of Charlbury stone, with Box ground weather stone external dressings, and Corsham Down stone internally. The chancel was built seven years ago, and the remainder of the church will be in accordance with that. The church will accommodate 730, and consists of nave, 69 ft. by 25 ft.; north and south aisles, 54 ft. by 12 ft.; north and south transepts, 14 ft. by 15 ft.; tower, 16 ft. square; vestry, 17 ft. by 17 ft.; organ-chamber, 17 ft. by 8 ft. The tower is at the west end, and when completed, its total height, with spire, will be 183 ft. It will have a wooden polygonal panelled roof inside; its height in nave from floor level to ceiling will be 43 ft. There will be five bays in good proportion on each side of nave, with an arcaded clearstory above. The nave is to be commenced at once, and the cost of the present work will be 7,000*l.*, and it is estimated that the carrying out of the whole undertaking will involve an expenditure of 13,000*l.* Mr. Mardon Mowbray is the architect, and Messrs. Symm & Co., of Oxford, are the builders.

The Hospital for Incurables.—Sixteen more rooms and offices are being added to the Hospital for Incurables. Bath stone is being used for the dressings, and Charlbury for the face work. Mr. Pearson, of 13, Mansfield-street, London, is the architect, and the builders are Messrs. Symm & Co.

St. Edward's School.—Further additions are in progress at this school. A large new house is now nearing completion, intended as the residence of the Head Master, with accommodation for thirty boarders. The building is carried out with red brick and stone dressings, in a style to match the other buildings. The work is being executed by Mr. Franklin, of Deddington. Messrs. Wilkinson & Moore are the architects.

The "Queen's Restaurant."—This new restaurant, situate in Queen-street, midway between New Inn Hall-street and Corn Market-street, has been opened. The architectural designs were supplied by Mr. H. J. Tollit, of St. Aldate's-chambers, who superintended the carrying out of the details. The work has been done by Mr. Bridgford, of Birmingham.

New Schools, Headington Quarry.—At the new Schools, Headington Quarry, an additional schoolroom, 40 ft. by 17 ft., with passage for hats and coats, has been built of local stone, with Bath stone dressings, to match the old work. The cost of the work is about 300*l.*; the builder being Mr. J. Horn. The architect is Mr. Codd.

Residential and Business Premises.—Several residences have been built on the Woodstock-road, by Mr. Brucker, for Mr. Walter Gray, during the past year. Each house is varied in its accommodation and design to meet, as far as possible, the requirements of different householders. The designs were furnished by Messrs.

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Wilkinson & Moore, architects. The houses are built of red brick, with stone dressings and tile roofs. A new residence has been built by Messrs. Wilkins, of Eynsham, on the Summertown-road, for Mr. George Fisher, which is the first house to break ground on this freehold building estate. The building is of red brick, with stone dressings, worked out from designs by Messrs. Wilkinson & Moore, architects. On the new building estate recently laid out by St. John's-College, adjoining the Canal, Walton Manor, a small colony of cottage residences is springing up. The roads and drainage works are complete, and have already been taken to by the Local Board. In nearly all cases the houses are being worked out from some architectural designs. Those that are at the present time well forward are a pair of houses built by Mr. Arnatt, a pair by Mr. Lucas, and a pair by Mr. Lambourne; also a block of six by Mr. Bedding, and another block of four by Mr. John Money, all of which we believe are from designs by Messrs. Wilkinson & Moore; also a pair of houses for Mr. Bond, from designs by Mr. Gray. Mr. W. Boucher, of Observatory-street, is erecting a detached house on the Iffley-road, from plans and under the direction of Mr. J. C. Gray, for Mr. T. Archer, of the firm of T. & C. Archer, coal merchants. Mr. Matthew Gray, of Cowley-road, is erecting a pair of semi-detached houses in Southmoor-road, for Mr. E. Bond. They are being carried out from the plans and under the superintendence of Mr. J. C. Gray, architect. In Frewin-court, Corn Market-street, the premises of Messrs. Gammon, Wicks, & Co., wine-merchants, are being rebuilt. The elevation is similar in character to that of the offices recently erected in Frewin-court for Messrs. Gammon & Wicks. The work is being executed by Mr. Thomas Selby from plans prepared by Mr. Frederick Codd, architect, Oxford. Alteration has been made to No. 9, King Edward-street, consisting of new front, strong room, fittings, &c., for occupation by the Oxford and Berks Bank, for Mr. St. Swithin Williams. Messrs. Symm & Co. are the builders, and Mr. Codd is the architect. Alterations and repairs have been carried out to the old North Star public-house for Messrs. Baker & Prior, of Broad-street. The new front was manufactured by Messrs. Baker & Prior from drawings by Mr. Rogers, designer to the firm. The general alterations were carried out by Mr. J. Horn, from plans prepared by Mr. Codd. Extensive alterations and repairs have been made to the old Ship Hotel for Messrs. Baker & Prior, of Broad-street, with new furniture warehouse in rear. The building will be fitted up as a University lodging-house. The warehouse consists of four floors, each about 110 ft. by 22 ft., and includes the Martyrs' Tower, one of the bastions of the old city wall, which formerly ran through the site of these premises. With the exception of the foundations and the bastion no part of the old work remained, the wall having been destroyed many years since, but the bastion has been carefully preserved. Messrs. Symm & Co. were the builders, and Mr. Codd is the architect.

Local Board Improvements. — Besides the routine work of the Local Board, a great deal of work in the shape of minor street improvements, paving, draining, &c., has been carried out under the superintendence of Mr. W. H. White, C.E., Engineer to the Board. At Walton Well the retaining-walls and embankment of the approaches to the new bridge over the canal have been completed, and the roadways formed by the Board.

BOLAM CHURCH, NORTHUMBERLAND.

Bolam Church was re-opened for divine service on Saturday last, after having been closed for some months during the progress of necessary restorations. It is an interesting fabric from the fact of its retaining the original Saxon tower raised by the first builder, subsequent Norman work, a Transitional south aisle and south doorway, an Early English elongation of the chancel and a chantry chapel, and two windows formed by the interlacement of lancets. Before the present repairs were undertaken, the roofs admitted rain in many parts; the outside soil had risen higher than the floor, causing walls, piers, and arches to be saturated with an unwholesome moisture. The thick coating of whitewash, which had been put on in former efforts to mend matters, has been now removed, new roofs have been placed over the structure, a new cement floor has been spread over the whole; new sittings have been substituted for the decayed pews; and a new reading-desk and pulpit have been placed in the nave. The Right Hon. Lord Decies and Sir Arthur Middleton have been at the cost of restoring the chancel, and the parishioners have borne the remainder of the cost, aided by the exertions of an appreciating committee and churchwardens. Mr. F. R. Wilson, Alnwick Diocesan Surveyor, has been the architect. The contract for the restoration was taken by Mr. James Gibson, Newcastle, with the exception of the painting and staining, which were executed by Mr. Garvie, Morpeth. The cost of the preservation of this beautiful work of former ages has not exceeded 700*l.*, exclusive of the chancel.

PROPOSED METROPOLITAN STREET IMPROVEMENTS.

At the meeting of the Metropolitan Board of Works on the 13th inst., a long report was presented by the Works and General Purposes Committee in regard to several extensive metropolitan improvements, in respect of which it is proposed to seek powers from Parliament during next session. The first recommendation contained in the report was as follows,—"That application be made to Parliament, in the Session of 1883, for power to form a new street 60 ft. wide, from the Holborn Town Hall to the 'Angel' at Islington, at an estimated net cost of 324,100*l.*

Mr. Dalton, in bringing up the report, said the various suggested improvements had been before the Board and the public over and over again, and they had all been thoroughly investigated and considered by the Works and General Purposes Committee. In respect of the proposed improvement from the Holborn Town Hall to the Angel, the committee had, by a very large majority, adopted the recommendation on the paper. It would be remembered that, in the Street Improvements Bill which the Board introduced in the session of 1877, a portion of the proposed scheme was included, viz., the making of a new street in the form of a viaduct from the intersection of Gray's-inn-road and Liquorpond-street to Mount-pleasant. This proposal, although passed by the House of Commons, was rejected by the Select Committee of the House of Lords, mainly upon the ground that the improvement did not extend sufficiently northwards. Since that period the local bodies had from time to time memorialised the Board on the question, urging the great necessity for the improvement, and suggesting that the original scheme should be extended by carrying the new street to a point near the Angel at Islington. The committee, having fully considered the subject, concurred in the view that it was desirable that this improvement should be carried out in its entirety. He concluded by formally moving the adoption of the committee's recommendation.

After some discussion, the motion was agreed to.

The next recommendation of the Committee was, that application be made to Parliament in the session of 1883 for power to widen to a width of 60 ft. the portion of Walworth-road between Hampton-street and Thomas-place, at an estimated cost of 66,900*l.* On the motion of Mr. Dalton, this recommendation of the committee was approved without discussion.

The Committee further reported that they had also considered the memorials from the Vestry of Islington, referred by the Board at various times, praying them to carry out as a metropolitan improvement the widening of a portion of the Upper-street, Islington. This was an improvement for which, judging from the particulars and statistics placed before the Board, great necessity existed, it being stated that, in consequence of the narrowness of the portion of this road between Islington-green and Barnsbury-street, accidents were of frequent occurrence, and the public traffic was greatly impeded. The committee, having carefully considered the application, and viewed the portion of the road which the Board was asked to widen, had now to report the conclusion at which they had arrived, and submitted the following recommendation,—"That application be made to Parliament in the session of 1883 for power to widen to a width of 60 ft. the portion of the Upper-street, Islington, between Islington-green and Barnsbury-street, at an estimated net cost of 148,000*l.*" Mr. Dalton moved the adoption of the report, which, after a long discussion, was agreed to.

The Committee also recommended that application be made to Parliament in the session of 1883 for power to widen, to a width of 60 ft., the portion of King-street East, Hammersmith, between the Broadway and a point opposite the Roman Catholic Convent, at an estimated net cost of 40,900*l.* Against this recommendation it was argued that this was a local, and not a metropolitan, improvement, and an amendment was moved that the proposition be referred back to the committee for reconsideration. Further discussion ensued, in the course of which it was urged that the street in question was a part of the Great Western-road, that it was one of the most important thoroughfares in the West of London; that a very large and increasing traffic passed though it; and that the road at present between Rowan-road and the Broadway was narrow and inconvenient, and quite inadequate for the traffic.

Mr. Richardson said this was a proposition to go to Parliament for an improvement which consisted of taking the forecourts of the houses to widen the road.

On a division, the amendment was negatived, the numbers being nine for and twenty-eight against. The recommendation of the committee was then adopted.

The Works Committee further recommended (and their recommendation was approved without discussion) :—"That application be made to Parliament in the session of 1883 for power to widen, to a width of 53 ft., the portion of Green-street, Bethnal-green, between Cambridge-road and Globe-street, at an estimated net cost of 58,300*l.*" In the course of their report the committee said,—"The grounds upon which this application is made are that there is a constant block of the traffic arising from the extreme narrowness of the greater part of this street, occasioning much inconvenience and sometimes serious accidents; that there has been a large increase in the number of houses and factories east of the thoroughfare; and that the street in question is really the continuation eastward of Bethnal-green-road, from the western end of which road the Board have provided direct access to the West of London."

The Board next resolved, on the recommendation of the Works Committee, that application be made to Parliament, in the session of 1883, for power to straighten the South Lambeth-road, and make it of a width of 60 ft. from Walton-terrace to Wilcox-road, at an estimated net cost of 18,500*l.*

The Works Committee further recommended as follows :—That application be made to Parliament, in the session of 1883, for power to widen Postern-row, Tower-hill, to a width of 65 ft., from the Nag's Head public-house to Trinity-square, at an estimated net cost of 78,000*l.*

This was agreed to.

THE PROPOSED WIDENING OF PARLIAMENT-STREET.

In the "Additional Chapter to the Story of the Government Offices" which we published on the 8th of July last, we criticised the proposal of the Office of Works to build the new Admiralty and War Office on what is known as the Spring-gardens site, especially as the Government had already, by the advice of former First Commissioners, spent a quarter of a million of money in acquiring property in the neighbourhood of Parliament-street and Great George-street. Going on to discuss the eventualities and possibilities of the property so acquired, we said :—

"This land, we are credibly informed, is to be offered to the Metropolitan Board of Works. It is actually proposed, if it has not already been publicly announced, to throw upon the Metropolitan Board the duty of widening Parliament-street by the obvious absorption of King-street, and to hand over, for a substantial pecuniary equivalent, Government property recently purchased at a heavy, even an exorbitant, cost, in order to obtain, at a vast extra outlay, the very improvement in the approaches to the Houses of Parliament which the scheme of building Public Offices in Great George-street would have of necessity accomplished. It is actually proposed thus to misuse money raised by the Metropolitan rates . . . . to continue an enlargement, which, if needed at all, is of imperial, not metropolitan, character."

As a sequel to the above, we have now to note that at the meeting of the Metropolitan Board of Works on the 13th inst., the following

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was one of the items on the *Agenda*, under the head of "Applications and Communications" received, viz. :—

"Letter from Her Majesty's Office of Works, &c., stating that, the Government having decided on erecting the new Public Offices on the site between Parliament-street [*sic*] and Spring-gardens, it becomes the duty of the First Commissioner to dispose of certain properties in Parliament-street, Great George-street, King-street, and Charles-street, which were acquired in the expectation that the site might be required for Public Offices, but before doing so he thinks it right to give this Board the opportunity of purchasing the property in question, with a view to completing the approaches to Westminster Bridge and the Houses of Parliament by widening Parliament-street to the same extent as Whitehall."

The letter was referred to the Works and General Purposes Committee for consideration and report. We have already expressed our disbelief that the shrewd majority of the Board will be led into the purchase of the property by any anticipation that the value of the new frontages created by the widening of Parliament-street will more than compensate for the entire expenditure involved.

THE WEST HAM LOCAL BOARD AND THE INSPECTION OF NEW BUILDINGS.

Under an Improvement Act which the West Ham Local Board obtained in the late session of Parliament, the Board, amongst other extensions of their powers, were authorised to appoint five building inspectors in addition to those already in their employ. The duties of these new officers will be to inspect all new buildings which may in future be erected in the parish. The determination of the Local Board to appoint these officers has been brought about by the existence of builders of the "Jerry" class, who, it is stated, abound in Stratford and West Ham. The five appointments were made at the meeting of the Board last week. The Building Act Committee submitted the names and qualifications of eleven selected candidates out of the large number of applicants from different parts of the country. The following five gentlemen were appointed by the Board:—Mr. John Adams, Devon; Mr. John A. Angel, London; Mr. Lockyer Sandilands, Greenwich; Mr. David A. World, London; and Mr. John George Morley, Stratford; all of them undertaking to devote the whole of their time to the service of the Board, and to act under the direction of the Board's surveyor.

THE WORK OF THE SCHOOL BOARD FOR LONDON.

SITES AND BUILDINGS.

Mr. E. North Buxton, Chairman of the School Board for London, made an interesting statement of the work that has been accomplished by the four successive Boards which have been elected to administer the Elementary Education Act in London since that measure was passed twelve years ago. We reproduce a few passages from the address:—

The Act of 1870 (said Mr. Buxton) requires that "schools should be provided for all the children for whose elementary education efficient and suitable provision is not otherwise made." We cannot be said to have yet reached this state of things. While the number of schools that have been built, together with those we found in existence, would more than suffice for the children of London as it was in 1870, London in 1882 has increased to such an extent that we still find ourselves in arrear. But though the stern chase which is imposed upon us is proverbially a long one, we have distinctly diminished the distance between the schools that exist and those that are needed. Thus, while the school population has increased since 1871 from 574,693 to 733,060, the accommodation in efficient schools has grown from 262,259, or 45·6 per cent. of the children of school age at that time, to 531,427, or 72·4 per cent. of the children now in existence. During the past three years the school population has increased by 34,720, and we have provided during that period new schools for 70,589. During the twelve years we have provided in 260 schools accommodation for 256,360 children, while the accommodation in voluntary schools, which in 1871 was for 262,259, is now for 261,868. If we now strike a balance of the net results, we find that the number of school places required, after making all necessary deductions for the reasonable causes of absence, amounts to 641,428; while the total number of school places in efficient elementary schools will amount at the end of our term of office to 539,044 only. One practical proof of this deficiency is found in the number of children who are still refused admission in the growing districts. While some improvements in detail have been introduced into the construction of our schools, there has not been much departure from the general design which was determined upon some years ago; but in a few cases a large central hall has been introduced, or, where space was a secondary object, schools have been built entirely on the ground-floor. The cost of our permanent Architect's Department, which has been sometimes criticised, is really far less than if we adopted an open system of competition. It amounts to less than 3·5 per cent. on the cost of the schools, and has the further advantage that experience of all suggestions of proved value is accumulated and applied in future designs.

OPENING OF THE GREAT EASTERN RAILWAY COMPANY'S FISH MARKET.

The new wholesale fish-market which the Great Eastern Railway Company has for some months been preparing on the ground level of their spacious new goods station at Shoreditch, has this week been opened for business, and the thousands of residents in and around the extensive districts embraced in the east and north of London have now the advantage of a large fish-market in addition to that at Billingsgate. The new market, which, it may be incidentally stated the railway company have designated a "depot," in order, it is understood, to prevent any interference by the Corporation, is situated on the north side of the station, the principal approach being from Bethnal-green-road, which leads to a carriage-way 30 ft. in width, running alongside the several arches under the station, which form the market. Ten of these arches, which are about 40 ft. in width each, and 100 ft. in depth, have been specially fitted by the company for fish and poultry market purposes. The floors have been flagged and channelled, and a comprehensive system of drainage and sewerage is carried out which admits of the entire floor area of the market, as well as the marble and stone slabs on which the fish are placed, being daily washed and cleansed. These slabs and the whole of the fittings and offices have been put up by the company. Of the means for successful ventilation employed we have less satisfactory knowledge. In the basement under the market floor there is a spacious storage space, which will be occupied by the several tenants of the market. At the rear of the several arches there is a raised platform, a line of rails running parallel with it the entire length of the market. The fish-laden trucks, on arriving at the railway station level above, will be lowered to the level of the market platforms, on to which the fish will be discharged for immediate transmission into the market. There has already been a large demand by dealers for the market space provided, all the arches which have been prepared by the company denoting the names of different fish-salesmen who have become the tenants. The present floor area of the fish-market portion of the depôt, which is capable of extension if necessary, is upwards of an acre in extent. It may be added that the company's vegetable and fruit market, which is formed of the arches on the south side of the station, and which was opened a few months ago, has been so successful that other arches are now in course of preparation for its extension.

Watt and Stephenson.—Among the exterior decorations of the great Polytechnic High School of Charlottenburg, Berlin, are the statues of James Watt and George Stephenson. The latter is represented as the "Father of the Locomotive Steam Engine," having the model of one under his arm. Watt is represented as absorbed in thought; he has a roll of manuscript in his left hand, while his right is raised with a gesture as though he were speaking. Stephenson has his right hand on his breast. Both inventors are represented as bareheaded, and in long coats. Stephenson has his top boots, while Watt is in low buckled shoes, knee breeches, and long stockings. Both the statues are the work of the sculptor, Professor Keil, of Berlin.

"PROPORTION IN PRACTICE."

Sir,—All controversialists on the subject of proportion in architecture will, I believe, concur in the profound conclusion arrived at by the writer of the article with the above heading, in last week's *Builder*, viz., that the parties to the controversy "are likely to confront each other as advocates of these incompatible theses. On one part it will be maintained that the employment of a precise and systematic scheme of proportion would in no way assist,—in fact, would hamper,—the designer and so far be detrimental to beauty of design, and therefore could not have been an instrument of such masters of design as the great Greek architects. On the other part we should hear,—As it can be positively made out that the Greeks of the best time did employ a scheme of proportion in the final adjustment and scrupulously exact execution of their designs, the presumption from their success is decidedly in favour of the importance of such an instrument, if we moderns can only recover and master it."

Now, although all controversialists concur in the foregoing conclusions, they have long since expressed them with far less circumlocution, and simply thus,—"either there is a science of architectural proportion, or there is not." Just so; the writer referred to, therefore, only lands us at the old starting-point, whereas if he really meant to lend a helping hand in the discussion, he should have pointed out to what absurd admissions the hypothesis that there is not a science of proportion commits those who may support it. The general conclusion of the scientists of this scientific age is that law reigns throughout the empire of Nature, but on the opposite hypothesis, architecture claims exemption from law. Now, if architects were not bound by law in their work they might do just what they please, as Sir Edmund Beckett affirms they do. No law, no responsibility, there would be neither right nor wrong. Who, then, but atheists with respect to æsthetics, nay, with respect to all law and order, could hold with such an hypothesis? "Order," it has been said, "is Heaven's first law,"—proportion to purpose is the characteristic of the divine handiwork of the Great Architect. Shall, then, mundane architects declare themselves independent of all rule and governance but their own whims? Sir Joshua Reynolds, some century since, had the acumen to perceive that "everything which is wrought with certainty is wrought upon some principle," and, again, "every object which pleases must give pleasure upon some certain principles." Colour is a far more subtle consideration than that of architectural proportion, for colour can only be measured by sense, whereas architectural proportion can be measured to a tittle by mechanical means. But if the possibility of a science of proportion be admitted, I cannot agree with the writer of the article aforesaid, that no theorist who is sufficiently sober-minded to be worth attention "would insist on science doing more than to help the architect to the leading dimensions of a composition, and that to imagine it would do more than this would be preposterous." Why preposterous? Is there the slightest evidence that law does not reign in the minutest, as well as in the most colossal aspects of nature, with respect to microscopic existence infinitesimal as compared with the least of architectural features? The minutest atom of matter is as amenable to the law of greatest universality, the law of gravitation, as the great globe itself. This attempt to claim exemption from law is but a symptom of the writhing of human pride, which would take all merit to itself; which would fain deny that excellence is but a symbol of faithful stewardship, of a right utilisation of means; and which would declare the dictum of the great poet, that Nature lends no scruple of her excellence, but that, at the same time, she claims both thanks and use, to be false sentiment, mere affectation. It is repugnant to the human microcosm to be compelled to admit that art when at its best is most completely in conformity with law; nevertheless, this is both the humiliating and the exalting truth. The whole weight of evidence, as well as the leaning of science, is in favour of there being a science of proportion in architecture. Every opportunity, therefore, should be taken to discountenance that false and vulgar opinion, that rules are the fetters of genius; they are fetters only to men of no genius.

To assume that "the proportions which are

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established between the notes of the accepted musical scale are not in the main arbitrary, and might not have been very different indeed," is but to assume that music is not yet established on its true basis. But supposing that the present musical scale has been arbitrarily adopted, we see that law reigns even in the second nature of use, that there is a science even in custom, a method even in musical madness, which can be taught and can be acted on.

It may be shown, too, that the writer referred to is not at all justified in asserting that, "it seems premature to expect that we are very close to the end of our journey" as regards the science of proportion, for he could not conscientiously say this if he himself knew the science; for he would know that it had been attained. If, however, he does not know the science himself, and although he may be far off from it, he is clearly not in a position to affirm that we are not close to the end of our journey, not knowing himself the whereabouts of what is sought.

W. Cave Thomas.

EMPLOYERS AND EMPLOYED.

Sir,—As the relations of masters and men have been much discussed lately in the press, and as your readers are naturally anxious to have facts rather than opinions laid before them, and as many of the assertions I have seen made are not in accordance with my own experience, will you allow me to give them the results of twenty-three years' trading, for nearly the whole time the sole member of a well-known joinery and (latterly) building firm, from which I am now partially retiring?

First as to trade-unions. I have never found any inconvenience from them, and the workmen would be very foolish to give them up. They have a perfect right to combine for their own advancement; it is simply the old motto, "Unity is strength," put into practice.

Then as to strikes. I have never had one. I read about them in the papers, and that is all I know about them. With the public clamouring for cheap work, and the workmen struggling for an improved position, strikes would seem the natural result; but when the matter can be discussed early it is compromise *versus* war, and strikes can generally be avoided.

Then, as to the honesty, intelligence, sobriety, and industry of the British workman as compared to past times and to Continental and other foreign workmen, my experience is at variance with the statements and assertions I see in the press from time to time.

I have never discharged a man for dishonesty; and I have no occasion, and never had, to doubt the perfect honesty of every man in my employ.

Then as to intelligence, the state of ignorance in which the present generation of workmen were brought up was enough to damp the ardour of the brightest men. This was not the fault of the workmen: the wonder is they have succeeded so well as they have.

Sobriety and industry I bracket together. I have never seen a man on my works the worse for liquor, and I have never discharged a man for drunkenness; and as for industry, I do not suppose any body of men ever worked harder or did a fairer day's work than the British workman does at the present time.

Masters have said to me, "Why, when I was a workman I did twice as much work as any of my men do now." Well, it might be so, and the result was the workman became a master; but we cannot all be masters, and a man must have strength, skill, and intelligence far beyond the common to attain such results. Then as to British *versus* foreign skill. In the Paris Exhibition of 1878 there was, your readers will remember, an avenue called "The Street of Nations." This was a rare opportunity for comparing workmen of all nations,—all picked men working under similar conditions,—Italians, Swiss, Belgians, Frenchmen, Spaniards, Japanese, Chinese, and Norwegians, all working orderly side by side; and, as I had business in the building, I watched them daily with great interest. Every nation worked in its peculiar way. The Belgians handled their heavy marble-like stone as only Belgians can; the Italians discussed the details of their decoration, and often came in a body down from the scaffold and, at a little distance, discussed, in a most excited manner, the respective merits of their different embellishments as only a nation of born artists can. The Japanese, merry little fellows, if you stopped to look at them they would nod, and laugh, and chatter to each other most amusingly. As for our friends the Heathen Chinee, they were fine athletic fellows, with pigtails down to their heels, and their faces beaming with intelligence; they seemed to despise scaffolding and ladders, and clambered about with the skill of practised acrobats, and, with the funniest little tools slung over their shoulders,—more like children's toys than anything else,—they patiently chipped, chipped, chipped away by the hour.

Bring those men to London, and what would they be? The Belgian would make nothing of our softer stone,—even an English Portland-stone mason is of no use as a Bath-stone mason, and neither is of use as a Kentish rag or granite mason. If a master builder saw a dozen of his Italians standing on the other side of the street smoking cigarettes, and coolly discussing the merits of the work they had in hand, it would drive him crazy; and the Japanese or the Chinaman could no more wield the heavy tools with which the British workman earns his daily bread than he could fly in the air.

Those men, therefore, who talk about foreign labour driving British labour out of the market are at sea on the subject, and those masters who have tried the experiment are not likely to repeat it.

Then, as to capital, we are constantly told that capital will be drawn from the trade, and what will the masters do then? The fact is, the only capital worth a button is knowledge. If a master builder knows his business, and is energetic, he may succeed; if he does not, and his only recommendation is cash, he will most assuredly fail.

I have now said my say. I do not mean to state there are no workmen who are bad in every sense of the term,—the same might be said of all ranks of society; but that those men form the rule and not the exception, I deny. I have told you my experience, extending, as master and man, over thirty-seven years, and I do not believe it is exceptional, but that the experience of the bulk of the masters is the same as mine, and that the calumnious statements one reads from time to time in the press have only to be inquired into to be refuted.

W. H. Lascelles.

THE PERILS OF PLEASURE.

Sir,—Pleasure's gentle laxation of overstrung nerves is naturally courted by most brain-workers in this age of speed. If it can be safely procured, and rationally enjoyed, Pleasure is pleasure indeed, not only yielding the desired relaxation at the time, but also imparting pleasure in the day of its review. But if in the search for pleasure perils are encountered, it were better not sought; for of it then, however pure or laudable in itself, may be justly said, as of the pleasure on folly based,—

"Pleasure known but by its wings,
And remember'd by its stings."

Confined workers in towns long for a week of sand or beach, and sea; and, when occasion permits, they hie to a watering-place of more or less note, in the hope of health and pleasure. They get accommodated with apartments, with or without a scramble, and, tired with their day's outing, they go to bed. As soon as they have retired, their sitting-rooms are converted into bedrooms, sofas and chairs being populated with great dexterity. Often two or three groups of lodgers are stowed away in a house that usually sleeps the original family but comfortably or healthily. It is well that sea air conduces to sleep. A wakeful, wandering lodger might possibly be surprised to find his day apartment made a bedchamber for a pair or so, the said pair or so not proving the cleanest or the healthiest of the human race. Many persons quit their scenes of pleasure with the seeds of disease sown in their systems by the abuse of the lodging-house trade.

I thus prefer a trip across the water. Workmen wishing to see the wondrous art-metal work of generations past often visit the shrines of art to cultivate whilst they refresh their minds. If there be nobility in pleasure, surely this is it. Pleasure, to be worthy of the name, needs to be instructive. While it relaxes, it must also edify. They draw upon their savings and go; but to go, they must board a steamer. Steamers, however, are not always admirable for their sanitary provisions. A friend of the writer went with his wife, a few weeks back, to revel in a cathedral of the hoary past and a noble city's mine of wealth. Their compartment was near a closet, and so strong was the smell that the lady passenger was made thoroughly ill. Better amid the city's sights and wonders, she became worse when shipboard was reached and the stench again encountered; and, on reaching home, she was struck down with a bad attack of typhoid fever. Fortunately life has been spared, but at a great cost of anxiety and weary watching, to say of nothing else, for one who sought to brace mind and body in the contemplation of things exalting. Pleasure can hardly be said to have resulted in refreshing in this case.

The doctor in attendance said he had recently met a friend who had taken a holiday trip to the same place and in the same steamer, and, noticing a difference in appearance, he inquired the reason. It was the same story. Typhoid fever arising from the closet's stench. Sanitary science should surely be able to check a stench in a floating closet, and so lessen the perils of the pleasure of art.

T. B.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

4,873. G. Hurdle, Southampton. Opening and closing window sashes, &c. Oct. 7, 1882.

4,811. A. J. Boult, London. Door stops or checks. (Com. by G. R. Elliott, Boston, and J. M. Winslow and T. E. Clary, Norwood, U.S.A.) Oct. 10, 1882.

4,839. A. J. Boult, London. Sash balances. (Com. by C. E. Bogle, Milton, U.S.A.) Oct. 11, 1882.

4,842, F. Garon, Southend. Locks or door-fastenings. Oct. 11, 1882.

4,850. W. Teaque, Illogan. Apparatus for ventilating purposes. Oct. 12, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named:—

October 10, 1882.

2,656. J. Harris, London. Means for holding up windows. June 6, 1882.

2,834. A. M. Clark, London. Water-closets, &c. (Com. by J. J. B. Frey, New York, U.S.A.) June 15, 1882.

3,688. W. Thompson, Shaw. Door knobs. Aug. 2, 1882.

3,969. J. Chaffin, Bath. Means of glazing greenhouses, conservatories, &c. Aug. 19, 1882.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending October 14, 1882.

1,019. C. J. Mountford, Birmingham. Fire-resisting bricks and blocks. March 3, 1882. Price 2d.

The bricks are made of asbestos and silicate of soda or potash with fire-clay. These materials are ground and mixed, then moulded and burned in a kiln. (*Pro. Pro.*)

1,021. L. Lenzberg, London. Door rods and springs. March 3, 1882. Price 2d.

The rod has a spring joint on that side which is connected to the bracket on the hinge side of the door, so adapted that it tends to close the door when it is opened. A spring bolt operates in slots or holes in the joint to fix it and allow the door to stay open. (*Pro. Pro.*)

1,039. G. Gore, Balsall Heath, and W. Morris, Blackheath. Stoves and grates. March 3, 1882. Price 2d.

The coal is supplied to the bottom of the grate from a hopper. (*Pro. Pro.*)

1,047. S. A. Clark, Croydon. Fastenings for window-sashes. March 4, 1882. Price 2d.

On the stiles of the lower sash are two vertical axes, the upper ends of which force bolts above the meeting-rails which shoot into holes on the upper sash and secure the window. (*Pro. Pro.*)

1,065. J. Wetherilt, London. Blinds or screens for windows. March 6, 1882. Price 6d.

These are enclosed in frames which are hinged at their lower parts so that the blind can be inclined. They are secured in this position by rods with hooked ends taking over studs on the sides of the frame.

1,620. P. M. Justice, London. Improved plaster for casts, mouldings, &c. (Com. by M. B. Church, Grand Rapide, Canada.) April 4, 1882. Price 4d.

This is composed of pulverised calcined gypsum, glue, and sulphate of zinc, and is very suitable for walls, &c.

WOOD AND IRON.

Sir,—Can any of your readers inform me of a method for working out the breaking strains of wood and ironwork without the use of algebra, and the best book (if any) on the subject?

R. H. Y.

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street.

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GLASGOW INSTITUTE OF ARCHITECTS.

The annual meeting of this Institute was held on Tuesday last, the President, Mr. John Honeyman, in the chair.

The Secretary (Mr. Wm. MacLean) read the annual report. The total number of members now upon the roll is forty-nine; and, while some further accession is desirable, the council consider it to be a fair subject for congratulation that, considering the necessary qualifications, so large a proportion of the profession in this part of the country has joined the Institute. The attention of the council had been given to the revision of the regulations for the measurement of mason work. They think it desirable that, before any decision is come to, the matter should be brought under the notice of the Edinburgh Architectural Association and the Edinburgh Measurers, with the view of introducing one uniform system of measuring mason work in all parts of Scotland. The New Municipal Buildings competition also occupied the attention of the council. The letter of the conditions was barely fulfilled by the exhibition of the ten designs submitted in the final stage for six days only in most unsuitable rooms, and the representations of the council as to the general desire of competitors and others that as many of the designs as could be obtained should be publicly exhibited were entirely unavailing. The Town Council unanimously refused to have anything to do with such an exhibition. In these circumstances, and having ascertained that it was generally desired by the competitors and by many members of the profession, the Institute decided to undertake the management and pecuniary responsibilities of the exhibition. The exhibition was accordingly held in the upper rooms of the Corporation Galleries (the use of which was kindly granted by the Town Council for the occasion), and was open to the public free of charge from September 2nd to September 14th. It proved both interesting and instructive, and was visited by over 4,000 persons. Fifty-six designs were exhibited, and these were illustrated by about 400 drawings.

The President, in moving the adoption of the report, referred to the proposal of the Gas Committee to debar all and sundry from supplying electricity, in order that they might secure a monopoly of that production themselves. Many of them must know that they were already reaping the fruits of this short-sighted reactionary policy, and that there was more difficulty in getting work of the kind done there than in any large city in the kingdom; but then, while five firms wish to commence work there, the Town Clerk has been instructed to inform them that the committee "cannot consent to any licences or provisional orders being granted to any parties empowering them to provide or supply electric light within the city." He could not say more on the subject then, but he would express his own personal conviction that, if the citizens allowed the Corporation to act on the recommendation of the Gas Committee, they would, ere long, heartily repent of it.

A meeting of the newly-elected council took place immediately after the general meeting of the Institute. Mr. James Thomson was elected president; Mr. David Thomson, vice-president; Mr. John Burnet, auditor; Mr. William Landless, treasurer; Mr. William MacLean, secretary.

STEAM HEATING OF TOWNS IN AMERICA.

Amongst the places in the United States where the system of supplying heat to houses through tubes from a common centre has been introduced, is the little town of Lynn, in Massachusetts. The project has been for a short time in actual operation, but through a series of explosions it seems that in the place in question, at least, the system is likely to be abandoned. On the 14th of August one of the larger steam-pipes, laid down under the street, exploded, causing a considerable amount of damage to the buildings in the immediate vicinity. This is the third explosion of the kind since the Lynn Steam Heating Company started operations. Owing to the fact that the cause of these alarming occurrences is unknown and no explanation could be afforded on the subject by those immediately concerned, the authorities of the township of Lynn have given notice to the company to remove their pipes and tubes from the streets without delay. This, however, they have not yet done, but, on the other hand, a reward of 1,000 dollars has been offered in the name of the company for the discovery of the person or persons who caused the last explosion. Notwithstanding this handsome offer, it is not expected that it will lead to any result, for it is said that the company themselves do not really believe that the explosions were caused by foul play. The real cause is believed to be attributable to the thinness and weakness of the pipes and tubes employed in the entire installation of the heating system, and this unwise economy in the original outlay appears likely to put a complete stop to an interesting, but as yet very imperfectly-tested experiment.

SEWER VENTILATION.

Sir,—Equally with your unfortunate correspondent, I am at a loss to understand in what lies the science of an ordinary sewerage system. My house drains into an earthenware pipe-sewer, in which, at intervals, there are fixed ventilating-shafts; but every time there is a heavy rainfall the sewer-gas is driven into my house through the scientific (?) traps, which are oftener than otherwise dry. I suspect there is a stoppage in the main sewer, but, of course, one cannot be sure as to the exact position, as we cannot examine these scientific sewers, and, for aught I know, the private connexion to my house may be gradually choking up. I should be glad if some of your enlightened readers would explain wherein lies the scientific principle of the system of sewerage, which appears to my unscientific mind to be opposed to the dictates of good sense.

Another Poor Buffer.

NECESSITY OF GIVING NOTICE TO DISTRICT SURVEYORS.

Mr. W. Balcock, of 119, Well-street, Camberwell, builder, was summoned before Mr. Ellison at the Lambeth Police Court, by Mr. Banister Fletcher, District Surveyor, for neglect in giving notice for work which had been executed at 182, Hill-street, Walworth. The work done consisted of a joist being inserted in a 9-in. party-wall for the purpose of supporting joists which had become decayed at the ends. The defence set up was that the work done was only repairing, and being so small it did not come within the meaning of the Act. The district surveyor referred the magistrate to sec. 15, sub-sec. 2, of the Building Act, which says that the ends of any beam or joist shall be at the least 4½ in. distant from the centre line of the party-wall.

The magistrate said the work done, although perhaps small, was a repair which came under the supervision of the District Surveyor, and therefore required the defendant to give the proper notice, and to pay costs.

The notice was then given and the money paid.

PROVINCIAL NEWS.

Newcastle-on-Tyne. — The new free library erected in Bridge-street, Newcastle, partly on the site of the Carliol Tower, at a cost of about 20,000*l.*, has been opened. The new building has been erected from plans by Mr. A. M. Fowler, until lately borough engineer of Newcastle. The design of the first story of the front elevation is of the Doric, and that of the remaining two stories of the Corinthian order of architecture. The centre portion of the building is 107 ft. 6 in. in length, and as there is at each end of this bold projecting wings 30 ft. wide, the total length of the exterior is 167 ft. 6 in. The principal entrance, with seven steps, is placed in the centre, through a portico 30 ft. long by 8 ft. wide. This is ornamented with massive stone columns supporting an entablature from which springs a continuous row of balustrades running the entire length of the front. The spandrel panels of the door at the principal entrance bear groups of carved figures representative respectively of literature and engineering; while on the keystone between, a bust of George Stephenson is brought out in bold relief. Niches, which will no doubt be filled at some future time, are provided at each side of the spandrels, and in close proximity to these are busts of Lord Collingwood and John Bewick. The whole of the front is surmounted by a massive pediment, supported by six caryatides, in the centre of which a carved date-stone is placed. Mr. Burn, of Newcastle, is the sculptor of the busts and carved work on the first and second stories of the building, and Mr. Pringle, sculptor, has executed the figures at the top. The bays at each end of the building are furnished with a medallion cornice, surrounded by a balustrade, and the roof is semicircular in form. Set back a little from the main thoroughfare, the public library is protected by a dwarf wall, surmounted by ornamental railings, with lamps placed at intervals. As to the interior, the basement is provided with a workroom, in which books are received, checked off with the invoices, collected, stamped, and labelled, after which they are sent to their respective departments in the library. Throughout the entire building open fireplaces have been dispensed with, and hot-water pipes employed for heating purposes. Passing through the portico from the street into the main building, the visitor finds himself in a spacious and lofty vestibule, 43 ft. long by 20 ft. wide, at the end of which is a beautiful marble group, by Lough, of the Archangel Michael subduing Satan. For this and other pieces of statuary by the same eminent sculptor the city is indebted to the generosity of the donor, Sir Matthew White Ridley, bart., M.P. The vestibule is supported by pillars of elegant design, and is divided from the main doors by a handsome plate-glass screen, with floriated ornaments and the city arms in bold relief, the entrance-doors bearing designs of the old castle, that at the left of the entrance being a representation of the Carliol Tower. To the left of the vestibule is a new lending library, 61 ft. long by 22 ft. broad, and it is connected with the Mechanics' Institute portion, which has been used as a lending library for the last two years. It was originally intended that the Mechanics' Institute portion should be the reference library, but so successful has been the lending library during the two years that it has been opened, and the demands made upon it have been so enormous, that the committee felt themselves obliged to abandon their original design, and to throw that room as well as the new lending library into one. The new portion of the lending library is so arranged as to store 25,000 volumes. This is accomplished by carrying the wall-cases on two sides of the room to a height of 13 ft., and by arranging separate double cases to form alcoves, projecting from the north and south walls. These are enclosed within a counter, which supports the library indicator. Five separate portions of the stock are placed within 3 ft. of the right or left of the issue desks. The connexion with the old lending library is effected by an elliptical arch cut through the main wall. The two rooms combined provide accommodation for at least 60,000 volumes. In the old room, to which there is a special entrance, the juvenile library is stored. In addition to the juvenile department, between 4,000 and 5,000 volumes of the publications of the Commissioners of Patents and Inventions will also be placed there. The committee have also temporarily stored in this room about 5,000 volumes acquired towards the reference library. A wide staircase leads to the reference library, which was at first intended as an art-gallery. A large coloured-glass window, of geometrical design, lights the staircase, in addition to a light from the roof. A statue of Edgar, by Lough, is placed on the landing, which is to serve for conversational purposes, so as not to disturb the comfort of the readers in the reference library. The reference library, which is 132 ft. by 41 ft., is divided by an entablature supported on Corinthian columns, and is lighted on the south side. Four life-size figures, in marble, by Lough, have been placed here, the gift of Sir Matthew White Ridley, bart., M.P. An American revolving book-case is to be provided, upon which, when ordered, all the works in the reference library upon any special subject may be placed, to be within reach of the reader at will. The book-case will hold about 200 volumes of various sizes, and when wheeled to the side of the reader, he has the advantage of a library specially devoted to the subject he may be investigating within his reach. This book-case does away with the necessity of littering the table with books, as each volume can be easily replaced until it is further wanted. The cost of the building and site has been about 20,000*l.*

Workington.—An energetic start has been made in the construction of the new works at Workington for Messrs. Cammell & Co., of Dronfield. When amalgamated with the existing works, the whole will cover eighty-three acres of land. The Derwent Works, which were purchased by Messrs. Cammell & Co. for 105,000*l.*, consist of three large blast furnaces, with all the necessary adjuncts. According to the plans agreed upon, a new chimney and a large shed for the purpose of placing therein six Bessemer converters in three pits, are to be built, while large boilers and engines will be laid down capable of turning out an average of 3,000 tons of steel rails per week. Several new furnaces will be erected, and all the improvements that modern science has invented will be adopted in the construction

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of the works. Ample engine-power will also be provided. It is the intention of the company to make the new mills of larger capacity than the present Dronfield works, so as to meet the contemplated extensive weekly out-put of steel rails. The cost of the additions are variously estimated at from 40,000*l.* to 60,000*l.*, and the contractor (Mr. R. H. Hodgson, Workington) has undertaken to have the whole work completed by March next. While those additions are being made, the plant at Dronfield will be removed to Workington. The cost of removal is estimated at 34,000*l.* Workington is already feeling the effects of the new enterprise in the extensive building operations prosecuted on all sides. "Dronfield" streets and "Dronfield" terraces are springing up all round, and even shops with all manner of designations to include the word "Dronfield" or "Sheffield" are being opened. It is expected that a population of between 2,000 and 3,000 will come to Cumberland with the new works, and it is estimated that at least 500 more houses will be required at Workington to provide accommodation for the great influx of workpeople.

Crewkerne.—Advantage has been taken of the holidays by the Governors of the Crewkerne Grammar School to complete the main entrance, which, when the new building was opened recently, was left in block for future attention. The whole of the façade of the building is now finished. The re-building of the school was talked of for years, and ultimately the designs of Messrs. Giles & Gough, architects, of Craven-street, London, were accepted. The structure is built of local stone, with Ham-hill stone dressings, and the style of architecture is of the Domesticated fifteenth-century type. The carved work about and pertaining to the entrance is now completed. It has been carried out by Mr. Harry Hems, of Exeter, from the architect's designs, and from ancient shields and crests provided him. We gave a view and plans of the new building in our thirty-ninth volume (July to December, 1880), pp. 264, 266.

HAMMERSMITH BRIDGE.

The Metropolitan Board of Works has recognised the hardships that would be inflicted by the closing of this bridge for two years without erecting a temporary bridge, for at the last meeting of the Board the Works Committee presented a report, in which they said:—

"The course which suggests itself to your committee as the one most likely to meet all the requirements is the construction of a temporary bridge to be used for the accommodation of the traffic during such time as it may be necessary to close the existing bridge. As regards the legal questions to be involved in the reference, your committee have to state that your solicitor has, by their direction, obtained the opinion of counsel as to the power of the Board to incur expenditure in making temporary provision for the traffic, which opinion is to the effect, although some doubt is expressed upon the point, that the Board could, assuming the contract were limited to the discharge of the obligation to maintain and repair the bridge, include therein a provision to work a ferry or erect a temporary bridge. A further question is, however, here involved, and that is whether the alterations proposed by the Board can be held to be within the powers conferred upon the Board by the Toll Bridges Act of 1877 with regard to the maintenance and repair of the bridge. Upon this point the Board are advised, in order that the whole matter may be freed from doubt and uncertainty, that it is desirable, before proceeding with the works included in the plans as now proposed, that they should obtain further Parliamentary powers, not only for constructing a temporary bridge as advised by your committee, but also to execute the desired works of alteration to the existing structure."

The Committee recommended action in accordance with their report, which was adopted.

COMPENSATION CASE.

FORD *v.* THE METROPOLITAN BOARD OF WORKS.

This was a compensation claim by Mrs. Ford, as widow and executrix of Henry Russell Ford, of The Ship public-house, 66, Gray's-inn-lane, opposite the side entrance of Gray's-inn, required for the Metropolitan street improvements. The claim was for between 2,000*l.* and 3,000*l.*, and on the other side it was alleged that the temperance movement had depreciated public-house property.

The premises belonged to the Cannon Brewery, and when leased to the late occupier, Ford, in 1879, the Board of Works had power to make the improvements in the neighbourhood, but made no claim when applied to, and notice to treat was given last December. The lease was at 130*l.* a year, with an agreement that if Ford dealt with the Cannon Brewery, the rent was to be only 65*l.* He let off the back premises for 30*l.*, and furnished apartments to about 60*l.* The profits were alleged to be net nearly 200*l.* a year, and twenty-seven years of the lease were unexpired. The premium was put at 1,500*l.*, which had not been paid, nor the interest. The claim by the evidence was 2,222*l.* On the part of Mrs. Ford, a claim was made for six years' profits as goodwill. On the part of the Board, the profits were said to be about 110*l.* a year, and the lease of no value without the licence, which, of the house in question, was worth about 500*l.*, and the fixtures and furniture was agreed upon at 127*l.*, and that was affirmed to be the full value. Mr. Ford had paid 250*l.* when he took the house.

Mr. Under-Sheriff Burchell put before the jury the several items of the claim and the evidence on both sides. The jury would consider the net profits, and fix what they thought proper. One side said six years was the usual, and the other side three or four years, for a goodwill.

The jury were in consultation three-quarters of an hour. They assessed the leasehold, interest, and goodwill at 700*l.*, and the fixtures and furniture at 127*l.*, making a total of 827*l.*

CHURCH-BUILDING NEWS.

Haggerston (*London*). — The spire of the Church of St. Paul, Haggerston, having been completed, the vicar, the Rev. S. J. Stone, on the 6th inst. mounted the scaffolding to a height of 103 ft., and, attired in his clerical and academic garb, placed in position the finial cross, after which some brief prayers appropriate to the occasion were said by the vicar. The congregation in the streets below, including 700 school-children, then sang "The Church's one Foundation," and the vicar from his exalted position pronounced the benediction.

Hoggeston.—The Bishop of Oxford has re-opened the Church of SS. Peter and Paul, Hoggeston (which name is said to be a contraction for Holy Cross Town, indicating the supposed original dedication). The building is one of considerable interest; and, after repeated attempts, since the preparation of the first plans eight years ago, and various proposals for reducing the width of the aisles, or for removing one or both of them altogether, or for an entire rebuilding on a smaller scale, on the score of cost and of the church being unnecessarily large for the wants of the parish, the original plans for reinstatement have been carried out in their entirety. The chancel has been restored at the cost of the rector, the Rev. C. H. Hole, and the remainder almost wholly through the exertions of two of the principal farmers, Mr. Baylis and Mr. Morris. The building has become latterly too insecure for use, and had been closed. The chancel, which had been rebuilt and shortened nearly to half its length, has been restored to its original length, and fitted with stalls in carved oak. The rest of the church has had new roofs, a very few of the old timbers being capable of re-use. Great effect has been obtained by the use of Northamptonshire orange-brown sandstone instead of the customary Bath. The work has been carried out by Mr. Green, of Wellingborough, under the direction of the architect, Mr. William White, F.S.A.

Whitstone.—The parish church of Whitstone, North Cornwall, has been re-opened after restoration. A rood-screen once stretched across the nave and aisles, but of this there are no remains, though certain projections on the walls show its position. Dividing the aisles from the nave are granite arcades, while light is given by arch-headed windows. In 1796 high straight-backed deal pews were placed in the body of the church and a singing-gallery erected at the western end of the nave. The foundation-stone of the south-east corner of the tower is an irregular block of white spar, and a tradition arose that the pixies placed it there, and that this stone was the origin of the name "Whitestone," which the first holder of the manor assumed, and afterwards gave to his parish. The church has for a great many years been in a most dilapidated state, and after the snow-storms of recent winters, its defects became so disagreeably apparent that any further delay of restoration could not be entertained. The churchwardens commissioned Mr. Hooper, of Hatherleigh, to prepare plans, and subsequently entered into a contract for the necessary work with Mr. Wiffen, of Holsworthy. The aim has been to retain the characteristics of the old church, and, where possible, the old material has been used. The old Cornish barrel-roof has been rebuilt, the carved bosses of the old roof being still retained. All the new woodwork is carved after patterns that remained in the old edifice, the work being performed by Mr. Northcott. The chancel has been extended, and a new porch added, and the church has been reseated and floored.

Chiswick.—Chiswick Church has been closed for restoration at the cost of Mr. Henry Smith, churchwarden. This restoration, we are told, does not mean the complete removal of old parts. Those marks of antiquity which are worthy of preservation will remain intact, such as the tower, which, in 1425, was erected by the Rev. William Bredale. The chancel will be widened 10 ft. and lengthened 10 ft. The north and south aisles will be re-erected in a later style of architecture to show that they are additions to the original structure. The whole of the new part of the church will be of Kentish rag, so as to harmonise with the old tower. On the old wall of Chiswick Churchyard there is a curiously-worded tablet, which records that Lord Russel in 1632 built the wall to preserve God's acre from "violateing of swine and other profanations." The antiquity of Chiswick Church is evident from the fact that in a grant of land by Edward the Confessor, mention is made of a previous charter of A.D. 866, which included the church and churchyard of the parish of Chiswick. So many additions have been made to the church in later years that the trained eye only can distinguish between the very ancient and the more modern parts. Mr. H. Smith, who provided the church with an organ-chamber, new pulpit, and a lectern some time ago, will spend 10,000*l.* on the building. The work of restoration is being carried out from designs by Mr. J. L. Pearson, R.A.

Clerkenwell.—On the 13th inst. Clerkenwell parish church, which has been in course of restoration internally, and of repair externally, was reopened with ceremonies in which the Lord Mayor and other civic dignitaries participated. The alterations in the interior of the church, which abuts on Clerkenwell-green, are so radical as to amount to a transformation. All the old-fashioned high pews have been cleared out and modern sittings in oak substituted. The upper galleries have been shortened, and in place of the old staircases leading to them, which used to block the windows, new staircases have been erected on the west side of the building. The side windows, of tinted cathedral glass, are all new; while the two windows at the east end of the church, and on which are portrayed the beginning and completion of Solomon's Temple, are the gift of the Crusaders' Lodge of Freemasons. The brass lectern was given by the Clerkenwell Lodge of the same craft. New heating-apparatus has been fitted up in the vaults, and the floor of the church is paved with wooden blocks. The exterior of the edifice has also undergone very substantial repairs. The cost of the restoration has been about 3,300*l.* The work was carried out by Messrs. Dove Brothers, under Mr. Blomfield and Mr. Paull as architects.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Springburn (*Glasgow*). — The new Roman Catholic Church of St. Aloysius at Springburn has been opened for worship. Designed by Messrs. Bruce & Sturrock, architects, Glasgow, the edifice occupies the site of the old chapel. It is divided, internally, into three roomy aisles separated by arcades consisting of richly-moulded arches supported on clustered columns with moulded caps. On the street front the aisles are masked by short transepts, and one of these contains the organ-chamber and baptistery, while the other holds the stair to the choir gallery. Piercing the street gable of the centre aisle is a large three-light lancet window, flanked by recessed niches, and over it a stone cross rises to the height of 60 ft. above the road. The intersection of the transepts and main roof is emphasised by a pinnacled flèche terminated by a cross, the whole reaching to a height of 100 ft. At the end of the central aisle is the sanctuary with its high altar, while the sacristy is on the west, and the Lady Chapel and the altar on the east. The building, which provides accommodation for about 1,000 persons, has cost some 3,000*l.*

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Loftus-in-Cleveland.—A new Roman Catholic Church is being erected here. The building, which is to cost about 600*l.*, will be dedicated to St. Joseph, and will, when completed, accommodate 300 worshippers. The style of architecture is Tudor, the materials being brick, with stone facings. The roof, of open timber, will be stained and varnished. The building will consist of nave, sanctuary, and sacristy. Mr. Martin Carr, of Queen's-terrace, Middlesbrough, is the architect; and Mr. Dickenson, of Saltburn, is the contractor.

Shefford.—On the 4th inst. (the seventh century of the birth of St. Francis of Assisi), the foundation-stone of the new church to be dedicated in honour of that saint at Shefford, Beds., was laid by the Rev. Dr. Riddle, R.C. Bishop of Northampton. The church is to serve for the ordinary parochial services as well as the Church of the Seminary of the diocese for ecclesiastical students and of St. Francis's Home for Boys. The architect is Mr. S. J. Nicholl, of 1, Caversham-road.

STAINED GLASS.

London.—The west window of St. Paul's Church, Camden-square, has been filled in with stained glass by Mr. James Barton, of Camden-road, in memory of his sisters, Mary and Louisa Barton. The style of the glass is similar to that which prevailed in the fourteenth century, and is in accordance with old examples which are still to be found in Wells Cathedral. The subjects illustrated are selected from the life of St. Paul. The chief figure is that of St. Paul himself, and on either side of him and in the three panels below are the following incidents: —Saul witnessing the Stoning of St. Stephen; the Conversion of Saul; St. Paul preaching at Athens; St. Paul before the Council; and St. Paul's Martyrdom. In the upper part of the window is (in the apex) a cross borne by two angels; in other openings are angels bearing scrolls inscribed with texts. The window has been designed and executed by Messrs. Lavers, Westlake, & Co., of Endell-street, Bloomsbury. In addition, the new approach and west door entrance has been made, the organ removed and restored, and six windows filled in with stained glass of mosaic design (by Messrs. Bell & Co., Kentish-town-road), at the entire cost of Mr. James Barton.

Winchester.—A window in the south aisle of the choir of Winchester Cathedral has been filled with stained glass, in memory of Lieut.-Col. Collins, of the 60th Rifles, who died in India, after going through the Afghan campaign. The window is the work of Messrs. Powell, of Whitefriars, London. The window is a four-light transom window, with cinquefoil-headed lights, and the arch of the window is made up with fifteen tracery lights of varied size and form. These are filled with figures of angels, double-winged, and resting on wheels, like St. Catherine's, an ornament taken from some old glass here, and also with cherubim. The upper lights have the four archangels, Michael, Gabriel, Uriel, and Raphael, and the lower openings have SS. Peter, James, John, and Paul, and these are represented with their proper traditional emblems.

SCHOOL BOARD SCHOOLS.

Felling.—Three groups of schools are in course of erection to meet the deficiency of school accommodation in the Heworth School Board District. Two have been completed, whilst the third, which is being erected at Windy Nook, will be completed in the course of a few months. The Felling Schools are arranged to accommodate 725 children. The building is in two stories, and the characteristic features of the interior are the large number of class-rooms provided, with the facilities that exist for easy and direct supervision by the heads of departments, and the means that are provided to enable all the children to approach and leave their several class-rooms without noise or disturbance to the rest of the scholars. Mr. G. Waddell, of Edinburgh, was the contractor for these schools, and the cost of their erection has been 3,461*l.*, or 5*l.* per scholar. The schools at the Felling Shore are for infants only, and the work has been well carried out by Mr. Alexander Thompson, contractor, of Gateshead. Messrs. Oliver & Leeson, of Newcastle-on-Tyne, are the architects for the three groups of schools.

London.—On the 6th inst. a new school, erected by the School Board for London, in Mina-road, Old Kent-road, was opened. This is the 260th new school erected by the Board, and its site occupies half an acre. The building has accommodation for 1,398 children, namely,—420 boys, 420 girls, and 538 infants. The ground cost 6,505*l.*, and the legal expenses necessary in obtaining it, 461*l.* 18s. 11d.; its total cost being therefore 6,706*l.* 18s. 11d. This gives a total cost per head on the site of 4*l.* 16s. The building of the school cost 13,130*l.*, which, with the architect's commission of 393*l.* 18s., makes a total of 13,523*l.* 18s., thus bringing up the cost per head to 9*l.* 13s. 5d. This makes the gross total expenditure 20,230*l.* 16s. 11d., and the total cost per head 14*l.* 9s. 5d.

Miscellanea.

Metropolitan Drawing Classes.—On the 12th inst. the Queen's prizes and honour certificates gained during the past year by the students of the various metropolitan drawing classes in connexion with the Science and Art Department at South Kensington were presented to the winners, in the Guildhall, by the Baroness Burdett-Coutts, in the presence of a large gathering of spectators. The chair was taken by the Lord Mayor. Mr. W. Busbridge, the conductor of the classes, read the annual report, which stated that during the past year classes had been conducted in twenty metropolitan centres, consisting in the aggregate of 960 students. In the Government examination of May last twelve passed in honours, two obtained Whitworth scholarships of 150*l.* each, 203 first class Queen's Prizes were gained, and 459 obtained certificates. The Baroness Burdett-Coutts having presented the prizes, gave an address of some length, in which she dealt with the interest taken by the City Guilds in the efforts made by those outside the walls in the promotion of the trade and commerce with which the City was so closely allied. They had a forcible reminder of the immense benefit the country derived through such an association as theirs in the gathering that night. It was not merely the technical advantage to be derived from the course of instruction, nor the material advantages accruing, that they had to consider, but rather the indirect results of the industry, perseverance, and self-restraint that must have been exercised by all attending the classes, all of which tended to the formation of habits equally beneficent in private as in public life. There seemed to her no method of fostering among the teeming population of the metropolis those habits of mind leading to the promotion of industry and reflection so likely to be attended with success as the agency of these classes.

Furniture.—Under the management of the City and Guilds of London Institute, at the Technical College, Finsbury, a course of about forty lectures by Mr. A. F. Brophy, will be given, commencing Wednesday, October 18th, at Eight o'clock p.m. precisely, and to be continued every Wednesday throughout the Session, on "Furniture, from the earliest times to the English Renaissance." The lectures will be illustrated by sketches of furniture, showing construction and details of mouldings in the different styles, so as to enable a cabinet-maker to design and execute work in any of these styles with correct feeling. They will treat of ancient furniture, furniture of the Middle Ages, and modern furniture.

Nottingham Government School of Art, 1882-1883.—A Travelling Studentship, value 25*l.*, is offered by a member of the committee of this school, Mr. S. Dutton Walker, F.S.A., for the encouragement of the study of architecture. The object of the scholarship is to assist the successful competitor to visit the Continent for the purposes of study. To insure this, the amount will be paid to him upon signing an undertaking to carry out the intention of the donor, and to submit the works executed during the tour to the committee upon his return.

Female School of Art.—The annual exhibition of students' drawings which received the Queen's Gold Medal and Scholarship, Baroness Burdett-Coutts's scholarship, and other scholarships and medals, takes place this Friday, the 20th, from 9.30 a.m. to 4 p.m., and from 7 p.m. to 9 p.m., and on Saturday, the 21st, from 9.30 a.m. to 4 p.m.

The Streets of Paris.—The estimate for street repairs in Paris next year has just been submitted to the Municipal Council by the Prefect of the Seine, who asks for a sum of 407,000*l.* The total area of the streets and roadways paved with stone is given in the estimate as being 6,800,000 square yards. The expenditure upon this head is nearly half of the whole amount, each yard of paving costing nearly sixpence. The area of macadamised streets has been much reduced of late years, and is now not more than 2,000,000 square yards. The cost of repairing this for next year is estimated at 184,000*l.*, or 2s. per square yard, the materials employed being ordinary flints, and porphyrus stone from the department of Mayenne, this latter being only used in a few exceptional cases, as it costs a guinea per square yard. The area of streets paved with asphalte is 345,000 square yards, and the cost of repairs for next year is estimated at rather more than a shilling a yard, the work being executed by contract.

Loss of Life by Fire in European Cities. A committee appointed by the Brussels municipality to consider what means should be taken to diminish the risk from fires, has drawn up a table showing the proportionate number of victims to fire in fourteen great cities of Europe during the ten years from the 1st of January, 1869, to the 1st of January, 1879. From this it appears that by far the largest number of victims were in London, where the proportion was 8·3 per 100,000 inhabitants. Next comes Cologne, with 7·1 per 100,000; then Hanover, with 5·7. The greatest immunity was enjoyed by the people of Munich, where the proportion per 100,000 inhabitants only reached 0·4.

Exhibition of Works in Horn.—The exhibition opened at the Mansion House on Wednesday, under the auspices of the Worshipful Company of Turners, was a most interesting one, containing as it did numerous ancient specimens of work in horn, besides exemplifying the various uses to which that material is applied at the present time. The exhibition was avowedly promoted by the Company with the view of furthering the technical education of workmen engaged in the trade, and it is to be regretted that, as it closes this Friday (the 20th), any recommendation which we might give our readers to visit it would not come before them in time to be acted upon.

A Monument to Fielding. — Some time before his death Thackeray expressed the hope that a memorial of Fielding would be erected in Somerset, his native county. But though many years have passed since this wish was expressed, no effort has been made to carry it out. We learn, however, that Mr. Arthur Kinglake, a well-known west-country magistrate, and brother of "Eothen," has been so far encouraged by promises of support as to commission Miss Margaret Thomas, of Hugh-street, Eccleston-square, who executed the marble bust of Charles Somerville, the sculptor, lately placed in the Taunton Shire-hall, to execute a memorial of the great novelist.

The Transmission of Electrical Force.—At the Electrical Exhibition which is being held at Munich some interesting experiments have been made by M. Marcel Desprez for transmitting electrical force. With two Gramme machines modified to the system of M. Desprez a half-horse motive power was carried a distance of about thirty-five miles, from Meisbach to the hall in which the exhibition is held in Munich. The communication was effected by means of a single telegraphic wire of the ordinary kind, supported upon wooden posts placed from point to point along the distance traversed.

Mahogany.—Some correspondents desire to know if mahogany is timber. Our reply is, "Yes." Gwilt defines timber as being all such wood as is suited for the purposes of building. In Jamaica and some other places mahogany is used for joists; it is also largely used in shipbuilding.

The Court Theatre.—Considerable structural alterations are being made, and a new porch erected, to this theatre, under the supervision of Mr. Alexander Peebles, architect, in order to satisfy the requirements of the Metropolitan Board of Works. The theatre will be re-opened during the current month.

Connaught Theatre. — This theatre has been sold, subject to the approval of the Court of Chancery, by Messrs. Thurgood & Martin, of Chancery-lane. The premises after decoration will be opened under the management of Mr. John Baum.

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Destruction of Ingestre Hall by Fire.—Ingestre Hall, one of the seats of the Earl of Shrewsbury and Talbot, was burned to the ground on the morning of the 12th inst. It is situated about four miles from Stafford, in the midst of an extensive park. Since their marriage a few months ago the Earl and Countess of Shrewsbury have resided at Alton Towers, about twenty miles from Ingestre Hall, which was left in charge of servants. In anticipation of the return of the Earl and Countess to Ingestre, large fires were kept burning daily in most of the rooms to air them. On the night preceding the fire, one of the servants went through the house about ten o'clock and found everything safe. The first alarm was raised at a quarter-past five on the morning of the 12th, and by the time the engines arrived the hall was a mass of flames. Willing helpers rescued what they could in the shape of furniture, paintings, and other valuables. The whole of the state-room floor, which was of imposing proportions, fell through into the grand hall below, and the flames shot through the main entrance to the other side of the building. The historical paintings on the staircase were all destroyed. The total loss is estimated at 100,000*l*. It is believed that the fire originated from the ignition of a beam beneath one of the hearths,—a common occurrence.

Sad Fatality to a Builder.—A very distressing accident occurred at the new Naval Barracks, Keyham, Devonport, on the 12th inst. Whilst Mr. Matcham, the contractor for the works, was standing upon a scaffold superintending the operations, a labourer came up with a hod, when Mr. Matcham moved aside to let him pass, and in doing so slipped from the scaffold, and fell a height of about 25 ft., in his descent striking a girder, and thence being precipitated to the ground. He fell on his face, which was terribly disfigured. He was immediately removed to his office in an insensible condition, and subsequently muttered a few words, but never perfectly regained consciousness, and died about an hour and a half after the mishap. The deceased was a native of Dorchester, but settled in Plymouth thirty years ago. In the course of his career Mr. Matcham has carried out several important works, amongst them being the new Public Hall, Devonport; Col. Peard's mansion, in Cornwall; the Rougemont Hotel, at Exeter; Mr. Singer's mansion at Paignton; the Imperial Hotel, at Torquay; St. John's Church, Torquay; and the large goods station of the Great Western Railway, at Millbay. His personal qualities were such as to cause him to be widely esteemed. The coroner's jury returned a verdict of "Accidental death."

Sale of Land.—A freehold estate was offered by auction at the Mart last week by Messrs. Protheroe & Morris. The estate comprised four acres of freehold land, and was distinguished as Osborn's Nursery, Fulham. It was offered with a detached residence, seed-shop, and conservatory recently erected. The auctioneer opened the sale by remarking that the land was immediately ripe for building, and was specially the class of land that was going off well at the present time, and in dealing with the same there was no loss of interest on capital to be considered, there being no danger of the land hanging fire, as plenty of substantial builders would be ready to go on the land, which in the course of twelve months would probably be covered with shops and houses. The property was put in at 6,000*l*., and after twenty-two subsequent biddings had been made, the hammer fell at 10,000*l*., at which sum it was sold to the well-known firm of Messrs. Veitch & Son, of King's-road, Chelsea.

Christmas and New Year's Cards.—We have received from Messrs. Hildesheimer & Faulkner a selection from the large series of prize designs which they have now reproduced, and are offering to the trade, and very beautiful of their kind they are. The firm spent, it will be remembered, the sum of 5,000*l*. in prizes and purchases, and the complete collection now produced will, it is stated, consist of more than 250 series, and fifty series on satin. We should have been glad to see more figure subjects: the large proportion of those which have reached us are flowers and landscapes. Doubtless, however, Messrs. Hildesheimer & Faulkner know the taste of the public. Without attempting to make selections, we may fairly mention a number of flower designs by Mr. W. J. Muckley as being equal to anything of their kind that we have seen.

The Worcestershire Exhibition. — On Wednesday last the Worcestershire Exhibition of Arts and Industry was closed, with some ceremony, by Earl Beauchamp, Lord-Lieutenant of the county. The Mayor of Worcester (Mr. W. Stallard), as chairman of the General Committee, read a report, which stated that upwards of 20,000 visitors had inspected the various exhibits of Worcestershire manufactures; and with the view of securing an interesting permanent record of the exhibition, and of supplementing its educational influences, the sub-committee had arranged for the early publication of reports on their various sections. The actual receipts of the exhibition had been 9,794*l*. 16s. up to the previous night, besides 290*l*. for items not yet quite ascertained. The actual and estimated expenditure was 8,500*l*., so that a balance of over 1,500*l*. was at the disposal of the committee. Earl Beauchamp then addressed the meeting, after which Sir Cunliffe Owen said the exhibition had been distinguished in one respect from all similor exhibitions, in that there had been shown in it processes of manufacture which had not been divulged to the public before. In his twenty-five years' experience he had never known an exhibition of this kind brought to so successful an issue as this had been, and he congratulated all concerned on the result.

Present Condition of Ephesus.—In reply to expressions of disappointment as to the appearance of the remains, Mr. J. T. Wood writes, —"Of great interest are the several courses of beautiful marble masonry of the south and west walls of the cella of an earlier temple, which were made to serve for the foundations of the last temple; also the foundation-piers of the great columns, and the whole of the marble pavement of an earlier temple, which was probably built in the time of Crœsus, who contributed largely to its cost. A portion of this pavement on the south side has been uplifted by an earthquake with a large mass of the mortar, which was in use at the time for building a church or some other large building within the cella of the temple. There is also to be seen on the north side of the site, and at the east end, 100 ft. of the lowest step of the platform upon which the temple was raised. Then there are countless drums of fluted columns, altogether making a most interesting though not an imposing ruin. A good idea of the appearance of the ruins may be obtained by a glance at the lithographs in my book, which were carefully drawn on stone from large photographs."

Announcements.—A new edition, enlarged, of Mr. Lewis D'A. Jackson's "Hydraulic Manual," consisting of working tables and explanatory text, is announced for early publication by Messrs. Crosby Lockwood & Co., London. The same publishers also promise immediately a new and enlarged edition of Mr. Michael Reynolds's "Stationary Engine Driving," a practical manual for engineers in charge of stationary engines; and the following scientific and technical works in their popular "Weale's Rudimentary Series":—"Land Drainage, its Theory and Practice," by Professor Scott; "The Smithy and Forge," including coach-smithing, farriers' work, &c., by W. J. E. Crane; "Details of Machinery," comprising instructions for the execution of various works in iron, in the fitting-shop, foundry, and boiler-yard, by Francis Campin, C.E.; "Plumbing," a text-book to the practice of the art or craft of the plumber, with chapters on house drainage, embodying the latest improvements, by W. P. Buchan, fourth edition, enlarged; "Quantities and Measurements," with rules for abstracting, hints for preparing a bill of quantities, and prices for all work in the building trade, by Alfred Charles Beaton, sixth edition, with prices revised to the present date.

Competitions: Matlock.—Fourteen designs were submitted in open competition for laying out the grounds of the Matlock Bath Pavilion and Gardens Company (Limited), several of them of considerable merit. The first premium of 25*l*. was awarded to Messrs. Barron & Son, Borrowash, Derby; the second premium of 15*l*. to Messrs. Brockbank, Wilson, & Malliner, Albert-square, Manchester; and a supplementary premium of 5*l*. to Mr. F. S. Smith, 14, St. Anne's-square, Manchester.

Surveyorship.—Mr. Alfred B. Brady, C.E., has been elected surveyor to the Sanitary Authority of the Maldon Union, Essex, at a salary of 200*l*. per annum. There were sixty candidates for the appointment.

The Nurses' Home at the Manchester Infirmary.—The Nurses' Home which has been erected in the grounds of the Royal Infirmary is rapidly hastening to completion, and will be ready for occupation probably in four or five weeks. It stands at the south-east corner of the Infirmary, and in its style of architecture harmonises with the main block of buildings. It is three stories in height, and there are about twenty-eight bed-rooms on each floor, special sitting-rooms for superintendents being provided in addition. Each bed-room is fitted with wardrobe, dressing-table, wash-stand, and fixed mirror. Gas and water-pipes are attached to each room also, and the whole building, with the exception of the sitting-rooms, which have fireplaces of their own, is heated with steam. Each room has its window; but, besides this, there is a swing-glass panel over the entrance-door, and a ventilating grating in the wall. By means of the glass over the doors light is admitted to, or received from, the corridors, as the case may be. Each set of rooms is provided with baths and other conveniences. The architects are Messrs. Pennington & Bridgen, and Messrs. W. Southern & Sons are the contractors.

Association of Municipal and Sanitary Engineers and Surveyors.—The Midland District Meeting is to be held at the Vyrnwy Waterworks (for the supply of Liverpool), near Llanwddyn, Montgomeryshire, on Saturday, the 28th day October. The members will assemble at the Works, about two miles south-east of Llanwddyn, at ten o'clock on the morning of Saturday, and will have an opportunity of inspecting in progress of of construction one of the most important works of water supply that has ever been attempted. The exceptional interest attaching to these works will be understood when it is stated that the Valley of the Vyrnwy, when closed by the masonry dam about to be constructed across it, will form a lake nearly five miles in length, with an area of 1,100 or 1,200 acres, and between 800 ft. and 900 ft. above the mean sea level. In many respects the magnitude of this work exceeds anything hitherto undertaken. The distance of Llanwddyn from any railway station renders it absolutely necessary that those members who intend to visit the Vyrnwy Valley should arrive on the previous evening, Friday, the 27th.

Canterbury Cathedral.—An addition has been made to the altar of Canterbury Cathedral by the filling in of four open spaces facing the choir with enamel mosaic designs. The subjects are four angels taken from the paintings of Fra Angelico, the originals of which are now treasured at Venice. The background of each is of gold, on which the delicately traced figures present a striking picture when seen in a favourable light. The work has been carried out by the Venice and Murano Glass and Mosaic Company.

Municipal Buildings for Leamington.—Alderman Bright, mayor of Leamington, laid the foundation-stone, on the 17th inst., of the new municipal buildings which are to be erected on a site near the parade, at a cost of 20,000*l*. The architect is Mr. C. Cundell, and the contractor is Mr. John Fell, both local men.

TENDERS

For the erection and completion of a new Wesleyan chapel at Sutton-in-Ashfield, Notts. Mr. Arthur Marshall, architect, Nottingham. Quantities supplied:—

H. Vickers	£1,325 0 0
W. Bailey	1,298 10 0
W. Hodson	1,249 0 0
Bell & Son	1,204 0 0
Dudson & Parish	1,170 0 0
G. Hewitt	1,134 0 0
S. & G. Frisby	1,075 5 0
Goodall & Denias	1,073 11 6
Boot & Redwood	1,035 15 0
Stainforth Bros.	990 10 0
S. G. Hibbert	929 3 6
Foster & Parkinson	919 0 0
Fisher Bros.	900 0 0
A. Eastwood (accepted)	839 9 0

For new roads at Carlton, near Nottingham. Mr. Frederick Jackson, engineer, Nottingham. Quantities by the engineer:—

George Morris, Carlton	£807 2 6
Thos. Smart, Nottingham	796 10 0
Jas. Knight, Loughborough	714 14 7
Wm. Cordon, Nottingham (accepted)	701 7 0

For alteration to South Hornsey Schools:—

Goodall	£140 0 0
Southcott	127 10 0
Devereux	117 0 0
Mattock Bros.	113 0 0
Kerry & Son	110 0 0
Altworth	106 0 0
J. S. King	103 0 0
Twitchin	102 10 0

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For alterations at 59, Bishopsgate-street. Mr. W. Smith, architect, 1, Gresham-buildings:—

	Granite.	Portland.
Stevenson Bros.	£1,020 0 0	£852 0 0
J. Anley	1,016 0 0	890 0 0
Mattock Bros.	977 0 0	819 0 0
Johnson	974 0 0	894 0 0
Woodward	935 0 0	—
Thomerson	850 0 0	700 0 0
Durnford & Langham	815 0 0	670 0 0
J. Harper	809 0 0	698 0 0
Richardson	789 0 0	752 0 0
W. Shurmur	783 0 0	684 0 0
Lark & Son	760 0 0	640 0 0

For alterations and repairs to the Old Chesterfield Arms public-house, May Fair, for the City of London Brewery. Mr. J. Jewhurst, architect:—

Hewlett	£876 0 0
Battley	851 0 0
Taylor	846 0 0
Longmire & Burge	797 0 0
Jackson & Todd	769 0 0
W. Shurmur	745 0 0
Spencer Bros.	725 0 0
Cubitt	725 0 0
Moore	624 0 0

For two houses at Wood Green. Mr. John Hamilton, architect:—

Larter & Son	£1,330 0 0
W. Shurmur	1,182 0 0
J. Harper	1,175 0 0
J. Roome	970 0 0

For alterations at 11, Dowgate-hill, for the Worshipful Company of Dyers. Mr. W. Waymouth, architect:—
W. Shurmur (accepted).

For the erection of new schools, Harrow-road, N.W., for the London School Board. Quantities supplied. Mr. E. R. Robson, architect:—

W. Brass	£12,548 0 0
W. Scrivener	12,340 0 0
Higgs & Hill	12,334 0 0
W. G. Larke	12,253 0 0
E. Lawrence	12,244 0 0
Perry & Co.	12,078 0 0
W. Oldrey	11,793 0 0
C. Wall	11,187 0 0
Stimpson & Co.	11,066 0 0

For proposed new roads and sewers at Harrow, for Mr. D. R. Soames. E. E. Croucher & Co., 76, Chancery-lane, surveyors:—

T. G. Dunmore	£1,198 0 0
G. Rayner	1,100 0 0
McKenzie, Williams, & Co.	1,024 0 0
J. Bell	991 0 0
T. Adams (accepted)	749 0 0

For building boundary-wall and fence at the cemetery, Shooter's Hill, for the Greenwich Burial Board. Mr. T. Dinwiddy, architect:—

F. Birt	£1,112 11 0
Holloway	973 0 0
M. Redman	887 0 0
Martin & Goddard	699 0 0
Bridd	643 0 0
G. W. Sly	600 0 0
F. C. Smith	595 0 0
Wood	577 0 0
Holding & Son (accepted)	548 0 0
Lonegga	510 0 0

For repairs at Old Park Farm, Enfield, for Mr. S. Sugden. Mr. Walter Graves, architect:—

Ward & Lamble	£597 0 0
Cooper	490 0 0
Harris (accepted)	358 0 0
Spencer & Co.	315 0 0
G. Thomas	267 0 0
J. Richardson	235 0 0

For sundry alterations, &c., at 52, Highbury New Park, for Mr. Moss Benjamin. Mr. Thomas Millbourn, architect:—

Warren	£240 0 0
Roberts	142 10 0
Fernley	130 0 0
R. Conder	126 0 0

For addition to house at Theydon Bois, for Mr. W. H. Nicholls. Mr. Thomas Millbourn, architect:—

Palmer	£909 18 0
R. Conder	890 0 0
Pamphilon	868 13 10
Salmon	690 0 0

For sundry repairs, &c., at malting premises, &c., Crib-street, Ware, Hertfordshire, for Messrs. B. Young & Co., Brewery, Hertford. Mr. C. A. Legg, architect, Mile End, London:—

F. Hitch, Ware	£298 0 0
T. Hunt, Ware	257 10 0
H. Huggins, Ware (accepted)	247 0 0

For fifty slate fermenting-squares, upon the Yorkshire system, for Mr. John Smith, the Brewery, Tadcaster. Messrs. Scamell & Colyer, engineers, 18, Great George-street, Westminster:—

Contract No. 10.—Slate Mason.
1st Section.
Ashton & Green, London (accepted) £2,750 0 0

For new front, &c., 22, Marine-square, Brighton. Mr. Arthur Loader, architect, Brighton:—

J. M. Newnham	£753 0 0
R. & F. Parsons	750 0 0
J. Barnes	726 0 0
W. Hackman	720 0 0
G. R. Lockyer	689 0 0
J. Bruton, Brighton (accepted)	630 0 0

For decoration, repairs, &c., 3, St. Peter's-place, Brighton. Mr. Arthur Loader, surveyor:—
Cheeseman & Co., Brighton (accepted).

For the enlargement of the National Schools, Ashford, Middlesex, by the addition of a new schoolroom, &c. Mr. W. Eversden, Howard-street, Strand, architect:—

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Lodge	£527 0 0	£63 0 0	£16 0 0
Reavell	475 0 0	68 0 0	15 0 0
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The Builder.

VOL. XLIII. No. 2073. SATURDAY, OCTOBER 28, 1882.

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Locks, Inclined Planes, and Lifts on Canals.

COMPARATIVE SPEED, WATER DEMAND, AND COST OF EACH METHOD.

UNDER the influence of the excitement which is now awakening in so many parts of the world as to transport by canal, great interest attaches to the account of the inclined planes on the Morris Canal (which extends from the Hudson to the Delaware River) which has been abstracted from the "School of Mines Quarterly" of New York, in the recently-published quarterly volume of the Minutes of Proceedings of the Institution of Civil Engineers. The canal in question is 102 miles long. In a distance of 60 miles it rises 914 ft., or more than 15 ft. per mile, from the mean tide level on the Hudson to the summit at Port Morris. Thence it falls 760 ft. to the Delaware River. On the Hudson side are sixteen locks, giving a total rise of 157 ft. But the serious further height of 757 ft. is surmounted by twelve inclined planes; and on the Delaware side eleven inclined planes give a descent of 691 ft., besides a fall of 69 ft. through seven locks. The canal is 4 ft. deep, 25 ft. bottom width, and 40 ft. top width.

The boats are of an average capacity of 65 tons, and are constructed in two sections, abutting together, and secured by pins and latches. This arrangement, which originated independently of the introduction of the inclined plane, is remarkably well adapted to that method of transport.

The inclined planes in question are laid with a pair of steel rails, the gauge being 12 ft. 4½ in. from centre to centre. The weight of the rails is 76 lb. per yard. They are spiked to longitudinal sleepers, which rest on stone slabs bedded in the ground, and are laid for a short distance along the bottom of the canal in both the upper and the lower pond. The boat is carried in a cradle, which is supported by four pairs of double-flanged wheels, provided with brakes, and is worked by two wire ropes. The water of the canal is used as a propelling power; a four-armed wheel, 12 ft. in diameter, giving movement to the winding-drum, also of 12 ft. diameter. The wire rope passes round a submerged sheave. The discharge is 1,000 cubic feet per minute, under a head of 45 ft., which is said to be equal to 235 horse-power. The gradient is usually one in eleven; and a laden boat, weighing 70 tons, is carried up the rise of 51 ft. in about three minutes and a half.

The object of introducing an inclined plane on a canal is twofold,—to save time, and to save water. On some of our English canals the rise of 10 ft. is accomplished in a single lock in about the time here allowed for five times that rise. As to water, it is estimated that the quantity that would be expended in a lock, or series of locks, giving a 51 ft. rise, would be twenty-three times that used for a laden boat in the case described, and 836 times that needed in the case of an empty boat. We may add that three minutes and a half is the time allowed for the filling of the large lock, 525 ft. long and 52 ft. 6 in. wide, at the Mulatière weir across the Saône at Lyons, with a head of 5 ft.

Both lifts and inclined planes are used on our English canals, although the neglect into which this important mode of transport fell on the introduction of the railway system has been such that it requires some research to ascertain what has been, or at the present time is, in actual operation in remote districts of England. On the Grand Western Canal, which was authorised by Parliament in 1796 for the purpose of opening a waterway between the Severn and the Bristol Channel, a lift was erected by Mr. Green in 1835. This lift was 46 ft. in height, consisting of two chambers, similar to those of a common lock, with a pier of masonry between them; each chamber being of sufficient dimensions to admit of a wooden cradle, on which the boat to ascend or descend floats. The cradle being on a level with the pond of the canal, watertight gates, at the end of the cradle and of the pond of the canal, are raised up, and leave the communication betwixt the water in the canal and the cradle free, and the boat swims into or out of the cradle. The cradles were balanced over three cast-iron wheels of 16 ft. diameter, to the centre of one of which spur and bevil gear was attached, so as to allow of operation by manual power if scarcity of water made it necessary. To compensate the variation in the length and weight of chain over the ascending and descending cradle, a length of the same chain is attached to the under side of each cradle, that obviates any disparity in weight. A slight excess of water is admitted into the cradle that is about to descend, which can be regulated at pleasure, so that, in fact, the expenditure of this ton or two of water is the motive power by which one barge is raised and another lowered at the same operation. This essential feature in the economy of the scheme has thus been known and utilised for at least forty-seven years.

The boats in this case were of small dimensions; and Mr. Green, in 1838, said that he should not recommend the use of a lift for boats of more than 30 tons, but that on narrow canals, for boats of that burden, and of from 50 ft. to 60 ft. in length, lifts were extremely advantageous. The time occupied in passing one boat down and another up this lift of 46 ft. was three minutes, whereas it was considered that thirty minutes would be required to attain the rise of 45 ft. by a series of locks, making the saving in time amount to nine-tenths, for boats of 8 tons. The quantity of water consumed is about two tons for eight tons of cargo, while in ordinary locks it is rated at about three tons of water per ton of cargo, showing a saving of more than 90 per cent.

It is a curious feature of this arrangement that in cases when the bulk of the traffic descends (as in a coal country on a high level), a weight of water equal to the weight of the loads sent down is actually raised from the lower to the upper level. Thus, in a coal country where water is scarce, the transport of the traffic by lift acts in the same way as pumping water to the higher levels.

On the 24th of June, 1854, the subject of inclined planes, lifts, and locks on canals was fully discussed at the Institution of Civil Engineers; the president, Mr. James Simpson, being in the chair. A paper by Mr. James Leslie was then read, descriptive of an inclined plane on the Monkland Canal at Blackhill, near Glasgow, and the opinions then expressed by Mr. Vignolles, Mr. Hawkshaw, Mr. Rendel, Mr. Bidder, and others, are of great interest as showing how, at that time, the competition between canals and railways was regarded by the engineers of the day. Mr. Vignolles observed that the smallness of canals was their great merit, and that it was especially owing to this feature of their construction that they had proved so much more successful in England than in France or in Ireland. At the present moment, it will be noted, not only is the reverse of that opinion held, but while the English canals are reduced to one fourth of their former tonnage, the French canals are daily assuming more and more importance, and their dimensions are 30 per cent. or more in excess of what were regarded, thirty years ago, as large canals in England. At the same time there is this much truth in Mr. Vignolles's remark, that very great economy of transport is attainable on a small canal.

The inclined planes on the Morris Canal in the United States were referred to in this discussion, and it is very interesting to observe that the principle of the "bogey," which has been so much relied on on American railways, and in some cases used by some engineers on those of the United Kingdom, was in use more than forty years ago on the Morris Canal. The principle of the incline is the use of a water-tight caisson, set level on a carriage, and fitted with rising or portcullis gates that shut water-tight at each end. The caisson, being hauled up to the top of the incline, and pressed hard against the gates of the upper reach of the canal, so as to form a water-tight joint, acts as a portable lock, out of which the boat is floated into the upper reach, and *vice versâ* in the case of vessels descending. There are two lines of rails, so that the ascending and descending cradles balance one another. The great difficulty is as to the introduction of a sufficient number of wheels to support the weight. On the Morris Canal two four-wheeled trucks bore the frame of the cradle, which rested on four pivots, two of them being placed halfway be-

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tween the wheels on each truck. The experience gained on the Blackhill incline, where the weight of carriage, boat, and water, was about eighty tons, borne on twenty wheels, showed that it is not advisable, with such a load, to diminish the number of wheels. For further details we refer to the debate.

So far back as 1789 inclined planes were applied to the purpose of conveying vessels from one reach of a canal to another at a different level, by Mr. William Reynolds, on the Ketley Canal, in Shropshire. They were afterwards adopted, but subsequently discontinued, on the Duke of Bridgwater's Canal, from which the hint was probably taken for the Morris Canal. An account of the latter is to be found in the "Sketch of the Civil Engineering of North America," which was published by Mr. David Stevenson in 1838.

On the Blackhill incline, in 1851, as many as fifty boats have been passed up and down in a day of ten hours. The time taken for a passage was ten minutes, against forty minutes by locks. The Governor and Council of the Company of Proprietors of the Forth and Clyde Navigation reported, in 1851, that in the working of the incline during the season in which it was used for the purpose of economising water 5,452 boats had passed by it, saving 60,000,000 cubic feet of water, or a two-months' supply for the trade done. The height to be overcome at Blackhill was 96 ft. and the incline was 1,040 ft. long. There were two tracks of rails, with a 7-ft. gauge, and two 25-horse power high-pressure engines were employed to impart motion to the caissons. The work cost 13,000*l.*; while the two double locks, constructed in 1839, cost 16,000*l.*

A great stride in the construction of works of this nature was made by the construction of the hydraulic lift graving-dock, in the Victoria Docks, by Mr. Edwin Clark. A description of this important work, illustrated by a plate, compiled from Mr. Clark's drawings, is to be found in vol. xv. of the Minutes of Proceedings of the Institution of Civil Engineers. This lift was the child, so to speak, of the study and experience acquired in making the arrangements necessary for lifting the tubular bridge over the Menai Straits, where no less a weight than 1,800 tons had to be raised. The great originality of the Victoria Dock arrangement lay in the associating the thirty-two hydraulic presses used in three groups, so arranged that their centres of action form a tripod support, upon which the pontoon is seated. Any catastrophe from such a cause as the bursting of one of the presses is thus guarded against. The sectional area of each ram being 100 circular inches, a pressure of 2 tons per circular inch gives 200 tons as the lifting power of each press, or 6,400 tons for the whole lift. From this must be deducted 620 tons, as the weight of the rams, crossheads, chains, and girders, leaving 5,780 tons for the pontoon and vessel. The presses were tested to 2½ tons per circular inch. The force-pumps are twelve in number, and 1⅞ in. in diameter. They are worked by a 50-horse-power engine, six pumps to the larger group of sixteen presses, and three to each of the smaller groups of eight presses. The extension of the system so as to provide for any probable weight is contemplated and discussed by Mr. Clark.

On the principle thus successfully brought into practice, Mr. E. L. Williams, engineer to the River Weaver Trustees, with the counsel and aid of Mr. E. Clark, designed the hydraulic canal lift at Anderton, which raises barges up to the capacity of 100 tons burden from the river Weaver to the Trent and Mersey Canal. We have not room at present to describe the ingenious mechanism by which this is effected. An account, illustrated by a drawing, will be found in vol. xlv. of the Minutes of Proceedings of the Institution of Civil Engineers. The length of the iron caisson containing the boat to be raised or lowered is 75 ft., and the work, for each caisson, is accomplished by a single ram, of 3 ft. diameter. The boat floats during the whole time; and Mr. Williams stated that, to his own surprise, "the canal boatmen, with their wives and donkeys, took to it most comfortably; and although stairs had been provided, they were not used." The improvement of the river Weaver has been carried on by a series of eminent engineers, from the time of Telford. Twenty years ago vessels of 100 tons only could use the navigation, but now 200-ton steamers work from Winsford to Liverpool.

In the flight of locks at Runcorn, where the difference of level is the same as at Anderton, it takes, according to Mr. Duer (the author of the paper describing this lift), from an hour and a quarter to an hour and a half for a barge to pass though. By the Anderton lift, eight minutes are sufficient for that purpose. In a chain of six locks, with a total fall of 51 ft., that depth of water, for the area of the lock, must be expended for each passage. Although, if the traffic demands it, this will be expended per barge, yet, in the event of six boats being ready to ascend the chain of locks in close succession, at a time when all the locks were empty, ten lockfuls would be required to make them to ascend. For six boats to ascend, and for six afterwards to descend, $\frac{21 \text{ locks} \times 50 \text{ ft.}}{6}$ = 175 ft. depth of water for the area of the lock would be expended. With the elevator the waste of water is only 6 in. for each pair of boats, if one rises and another descends at the same time; or 3 ft. of water for the six pairs, being 1·7 per cent. of the water required for locking, besides the gain on time.

The cost of masonry of basins, approaches, &c., for the Anderton lift was 18,965*l.* That of the ironwork and machinery, including patent right, was 29,463*l.*, making altogether a total of 48,428*l.* for the lift. But the contract was taken at the time when the price of iron was the highest ever known in England.

An allowance of 5 per cent. for interest, and of a second 5 per cent. for depreciation on the capital cost, comes to 93*l.* per week; working expenses, when the lift is in full operation, amount to about 15*l.*, making a total of 108*l.* per week. The Parliamentary tolls are,—

	s.	d.
Per ton for all goods	0	1
For each laden barge	1	0
For each empty barge	2	6

The capacity of the lift is given as sixteen barges per hour,—eight up and eight down,—giving 480 of each per week. The load averages 25 tons, making 12,000 tons per week, so that for one week's traffic the possible income would be,—

12,000 tons at 1d.	£50
480 laden barges at 1s.	24
480 light barges at 2s. 6d.....	60
	£134

Making a profit on the working of the lift of 26*l.* per week. This gives the annual traffic of 624,000 tons, which, though high, is far from being the maximum attained on more than one important English canal. The charge amounts to nearly 2·7d. per ton of goods passed up. It would be very desirable to have the means of comparing this cost, from the freighter's point of view, with that of passing a chain of locks.

THE PRECURSORS OF THE ASSYRIANS.

Few more interesting acquisitions to our daily-increasing knowledge of the artistic history of the past have been made of late than those afforded by the series of Chaldæan antiquities which, after having been unearthed almost in secret by the French Government, are now at length placed on public view in the new Assyrian galleries of the Museum of the Louvre. With the art of Assyria the labours of Layard and of Botta have made the artistic world familiar; the recent discoveries made by M. de Sarzec, the French consul at Bassorah, if they do not yet place the Louvre on the level with our British Museum in the possession of specimens of Assyrian art, may be looked upon as supplying a fund of information on a perhaps even more interesting and certainly earlier civilisation.

Relics of the art of the Chaldæans,—the forerunners and teachers of the Assyrians,—have till now been of the extremest rarity; the British Museum and the Louvre have both possessed fragments of bricks, statues, and statuettes known to belong to the archaic stages of Assyrian civilisation, but further research in this direction has been singularly thwarted by circumstances. Chaldæa, which lies to the south of the district so successfully explored by Layard and Botta, is situated in a strip of land formed by the embranchment of the Tigris and the Euphrates; each year the district, during certain seasons, is entirely under water, leaving a series of unhealthy marshes scattered over a country once fertile and thickly populated,—the seat, more than twenty centuries before the Christian era, of a brilliant civilisation, of which, though mention is made both in Biblical and classical history, we have so far possessed no exact knowledge. In this deserted district have reposed undisturbed till now the relics of the Chaldæan people.

It has been the good fortune of archæological research that M. de Sarzec, the French consul at Bassorah, should have possessed the zeal to undertake a series of excavations on the site once occupied by the Chaldæan cities. When, some five or so years since, the success of the consul's explorations was proved to the home authorities, the utmost secrecy was enjoined so as in no way to excite the emulating zeal of any foreign nations. Hence it is only within the last few months, when the result of several years' successful excavations have been at length sent home, that any public attention has been brought to bear on what will prove, we suspect, to be among the most curious archæological discoveries that have been made since the day when Layard's explorations aroused such widespread interest. Layard's discoveries, however, only opened new horizons of conjecture, and it is not until now that these conjectures can be said to be explained by the results of M. de Sarzec's recent explorations in Chaldæa.

Consul at Bassorah, M. de Sarzec visited the whole of Mesopotamia as far as Bagdad, then, descending southwards on his journey back to Bassorah, he traversed the plain which stretches between the Tigris and Euphrates. Here, in a district unvisited by any previous explorer, he determined, entirely on his own responsibility, to commence the series of excavations the results of which are now submitted to the attention of the archæological world. M. Georges Perrot, himself a distinguished Orientalist, has graphically described, in a recent issue of the *Revue des Deux Mondes*, the adventures of M. de Sarzec in the pursuit of his task, and it is not unlike a chapter of Captain Marryat or Mayne Reid, the story told of the worthy French consul's encampment in the midst of the once thickly-peopled but now almost inaccessible district, visited not alone by all the horrors of marsh-fever and intolerable heat, but by hordes of nomadic and reckless Arab marauders, who more than once attacked the party; for Chaldæa proper,—that is, the plain stretching between the Tigris and Euphrates, from the site of Babylon to the confluent of the two rivers,—is one of the most remote and rarely visited districts of the whole Turkish empire. Provided with the necessary powers, and accompanied by a gang of trustworty native workmen, it was here that M. de Sarzec, in the winter of 1876, commenced operations.

The spot known to the Arabs as Tello, from the *tells* or artificial hillocks which mark its position, lies in the desert on the left bank of the Chatel-Hai Canal,—a still existing relic of the ancient Chaldæan system of irrigation,—an hour and a quarter's march to the East above Chatra and below Said-Hassan, both on the other side of the canal. Tello, it may be remarked, will be found on no existing map of the district; but Said-Hassan and Chatra, which may serve to determine its position, will be found on the map which accompanies Loftus's "Travels and Researches in Chaldæa" (London, 1857). Such, however, was the impossibility of settling down at Tello, where, in the dry season, not a drop of water was to be had, that the camp had to be pitched at an hour's walk from the scene of the daily excavations.

Under these conditions the difficulties met with by M. de Sarzec can be understood. In 1881 he suspended his researches, after four separate campaigns, during the last two of which upwards of 200 men were employed. There alone remained the transport of the unearthed antiquities from Tello to Bassorah, and thence to France. The chief difficulty lay in the three miles or so which separate Tello from the canal, for many of the statues were of considerable weight, the lower part of the principal figure exceeding three tons and a half. By the use of a number of teak planks the work was finally completed, although five weeks were occupied in the transport of the largest statue alone. Once afloat, an English vessel bore the precious relics to Marseilles, whence they reached, some months since, the museum of the Louvre, where they have been subjected to the most minute study on the part of the archæologists and Orientalists. The French Government have liberally recouped M. de Sarzec for his outlay; and though we may express some regret that

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the English agents who tempted the worthy consul at Bassorah were unable to induce him to part with his treasures, they are now placed in Paris as entirely at the disposition of students as if they had come to enrich our collections in Great Russell-street.

What, now, is this art which these recent discoveries in Chaldæa have brought to light? During the whole course of antiquity (of Biblical antiquity, we may call it) there existed between the western border of the high plateau of Iran and the desert of Syria, two distinct yet strikingly similar nations, who occupied the double basin of the Tigris and the Euphrates. Both possessed the same type,—the Jewish type,—the same language, the same art, the same writing, the same tastes, similar manners, costume, and religion. Where, however, the difference is observable, is in the fact that Assyria became entirely a warlike nation, and was, ten centuries before our era, one of the most powerful military monarchies of the world; whilst, on the other hand, Chaldæa was more exclusively devoted to industrial and scientific pursuits. It was essentially to the superiority of its intellectual culture that Babylon owed its influence and fame. The highest social position would seem invariably to have been reserved to the sacerdotal caste,—to those whom the classic writers call markedly the Chaldæans, the scientific students, the *savants* of those distant days, and to whom the system of Greek philosophy may in no small measure be said to be greatly indebted.

Here, on this once fertile strip of land, in the centuries almost as remote as those in which the oldest Egyptian monarchs reigned, the Chaldæans created a great civilisation, a complicated religion, a language, possessed technical and industrial processes, a profound knowledge of scientific agriculture, a literature, and a brilliant art developed under many forms. This civilisation preceded that of Assyria; the relative positions of the two being not unlike those of Greece and Rome, or, in our own time, of China and Japan. Like the Assyrians, the Romans were better fitted for conquest than their masters in refinement, the Greeks; and, as we see in the case of the Japanese, many of the art-traditions of their teachers, the Chinese, have been developed in their more modern hands with singular brilliancy. The Chaldæans never appear to have sculptured on their walls such spirited pages of their history as adorned the palaces of Nineveh. None the less, the Assyrians must be looked upon as only the pupils, intelligent and gifted as they were, of the Chaldæans. The reputation of the Chaldæans is Biblical, but their art remained till now practically unknown to us; we possessed a few cylinders, a few bronzes, a few bas-reliefs and terra-cottas, but their meaning was largely conjectural. As long ago as 1817, John Landseer (the father of Sir Edwin) communicated to the Society of Antiquaries some "Observations on the engraved gems brought from Babylon by A. Lockell, esq.," and a few years later, he also delivered a series of lectures (eventually published in 1823) on the engraved hieroglyphics of Chaldæa. The better-founded conjectures which were suggested by the Assyrian discoveries of later years were, however, none the less problematical, though everything pointed to Assyrian art as a derivative of that of Chaldæa.

With the relics from Tello we can at length form an opinion respecting the art of Chaldæa, and not merely from a number of small and unimportant objects, but from remains of considerable size, by means of which the religious, civil, and funerary architecture of the people can be judged; as also their art as represented in numerous statues, basreliefs, and statuettes in bronze and terra-cotta. These remains belong to what is called "the first Chaldæan empire," and are of a much greater antiquity than any Assyrian monuments we possess. This assertion is corroborated not alone by the archaic character of the art,—always a deceptive criterion in the past, when refinement was so irregularly distributed over a country,—but by the nature of the signs which compose the inscriptions found on each monument. These belong to the oldest form of Chaldæan writing; like that of Egypt, it was at its outset essentially hieroglyphic, and composed of a series of pictured words. It was only later that, with the desire to obtain greater rapidity, the scribes reduced their signs to the character known as cuneiform or wedge-shaped. But between these two periods many centuries must have elapsed.

A comparison of the artistic differences of the two arts leads to a similar conclusion, and this suggestive means of study has been favoured by the excellent arrangement in the same room at the Louvre of the early Assyrian monuments and those of Chaldæa, both clearly the creations of one school. General treatment of forms, of drapery, of costume, of attitude, all afford ample matter for the attention of the student and the expert, and show how direct and uninterrupted were the traditions by which the Assyrian art of the seventh century (B.C.) is connected with that of the Chaldæans as represented in these newly-discovered monuments, the oldest of which carry us back probably twenty centuries prior to the Christian era.

When the plans of the Tello ruins are made known, similar conclusions will doubtless be arrived at respecting the architecture of the two nations. The principal edifice of Tello or Sirtella strikingly recalls the great Assyrian palaces, but on a smaller scale, as can be understood when the relative importance of the Chaldæan princes and the powerful rulers of Nineveh is taken into account. To erect such huge edifices as the palace of Sargon, with its superficies of twenty-five acres, the Chaldæans did not employ flocks of whip-driven captives, but the principles of construction employed are the same as at Khorsabad. At Tello, as in Assyria, the edifice is built on a basis of unbaked bricks, rising about 50 ft. above the level of the desert; the walls of the rooms are all of baked brick, while in Assyria they are generally of unbaked bricks, but none the less the constant and alternate use of baked and unbaked bricks is one of the chief characteristics of all the architecture of Mesopotamia.

The monuments of very different epochs have been discovered at Tello, the oldest being unquestionably the most interesting, carrying us back as they do to centuries, the work of which we could scarcely expect to find in existence. A *stèle* of white stone, covered on both its faces with inscriptions and bas-reliefs representing strange scenes of war and burial, appears to offer by its character the proof of being the oldest specimen. The art is essentially tentative, possessing not a trace of style,—the work, in fact, of mere beginners, but interesting as representative of the primitive art of Chaldæa. The advance made is shown by a numerous group of statues and fragments, all indicative of a noticeable progress made by the artist in his realisation of nature, in face of the difficulties of the material he employed. The nude, where represented as in uncovered shoulders or arms, is firm and robustly treated, the hands and feet are well drawn, the details fully marked. The representation of the human face, as presented in two heads, shows no less breadth of treatment. The long beard and curled hair, it may be remarked, are not yet introduced. An interesting effort,—not noticeable in Egyptian or in the subsequent Assyrian art,—can be traced to give some idea of the relief and direction of the folds of drapery. As representative of the Archaic Chaldæan art, these figures are of the utmost interest; but the conventional treatment,—the figures in general being seated and very squat,—is marked.

Once arrived at this degree of merit, Chaldæan art progressed with rapidity; but of its ultimate development we possess alone a few small fragments, which, while ample in themselves to show the skill attained by the Chaldæan sculptors, are singularly calculated to excite our curiosity as to what must have been their more important creations in a period when we may say their art had arrived at its classic development,—when its artists, free and learned in their execution, are complete masters of the power they possess to render what they desire to imitate in the life about them.

What influence this art exercised on that of Assyria we now know, but till recently many points in connexion with the sculptures and bas-reliefs of Nimroud, of Khorsabad, and Kouyoundjik, were surrounded with puzzling doubts,—doubts at present solved by the relics brought from Chaldæa by M. de Sarzec. The curiously contradictory character of much of the Assyrian art, conventional and yet full of life, stiff and yet natural, is now explained by its evident dependence on the earlier traditions of Chaldæa; the Assyrian art of even a thousand years before the Christian era is not, as has long been believed, a primitive or even archaic art; it is not what is understood as a classic art,—the art of a school striving to interpret nature by a close study of its beauties. It is not, perhaps, an art in decline, but it may be said to be stationary, and which, with a view to the production of a large quantity of work, freely uses the conventional formulas created and taught by its masters and teachers. The position of Assyrian art in its relations to the earlier art of Chaldæa may be in a measure compared with that of the Greek traditions of Phidias, of Praxiteles, and of Lysippus, in the hands of the later artists of Pergamos, of Rhodes, of Antioch, and of Rome, where all the skill and learning of the original school may be found united to a novel expression of enhanced grace of life, of vigour, and of even theatrical energy, such as exactly marks the art of Assyria, when compared with that of Chaldæa; but neither the Greek sculptor of the declining centuries of antiquity, nor the Assyrian sculptor, can be said to invent or create in the true sense of the word. Diligently as the Greek still studied nature, it is less with his own eyes than with those of his predecessors; it was they who taught him to render his model according to those canons which constitute Greek "style." Such also was the position of the Assyrian sculptor, even more urged into the routine of conventionality by his constant representation of draped figures. It is only when he represents animals that he appears to have referred to nature, and there his skill is masterly. In the treatment of the human figure he follows only the traditions of his Chaldæan predecessors, whose power of interpreting nature was the result of a close observation and study, the rendering of which it is curious to trace,—when the art of Chaldæa and Assyria are compared,—the latter artists exaggerating in the same manner as the successors of Phidias exaggerated his treatment of the nude.

It will be seen that the interest of the discoveries made by M. de Sarzec is great. A light has been thrown on the origins of a powerful civilisation which, till now, possessed in the eyes of the archæologists many conjectural points. With the existence of these recently-discovered relics of Chaldæan art, the art of Assyria ceases to be an incomprehensible problem. Like the Egyptian art of the Theban dynasties, which it in some points resembles, it was, we see, preceded by a naturalistic or realistic period, which, by its close and simple study of the living form, created one of the essentially original styles of antique art from the influence of which Greece at the outset unquestionably acquired no small share of profit.

One more step has, in fact, been made towards our knowledge of that mysterious westward movement of civilisation from Central Asia,—which history will some day, we believe, explain,—and which, with the discoveries first of the Egyptologists in the land of the Pharaohs, then of the Assyriologists in the mounds of Nineveh, and now in the desert of Mesopotamia, has, within this century, shown us the true origin of Greek art and dispelled the fallacies of the old school of antiquaries, who claimed that the art of Phidias was the Heaven-born creation of Greece, that land of legend and romance, of learning and of refinement, of wisdom and of wit.

SALISBURY CATHEDRAL.

We hear with great satisfaction that the Dean and Chapter of Salisbury, at their meeting on the 19th inst., appointed Mr. Arthur W. Blomfield, M.A., architect to the cathedral, in the place of the late Mr. Street.

The Painter-Stainers' Company.—On St. Luke's Day, October 18, the master, wardens, and livery of this company, in accordance with custom, met together to celebrate the feast of the patron saint in their hall, Little Trinity-lane, Queen Victoria-street, afterwards attending divine service at the Church of St. James, Garlickhithe. The old hall was destroyed in the Great Fire of 1666, and about the end of 1669 the present structure was erected. The building is now threatened with destruction, in order to facilitate the carrying out of the "Inner Circle" railway completion scheme. In the afternoon, a common hall was held, when Mr. W. F. London was elected master for the year ensuing; Mr. J. D. Crace, upper warden; and Mr. S. S. Phillips, renter warden. A banquet [illegible] the evening.

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MATTERS AFFECTING ARCHITECTURE AND THE PROFESSION.

At the opening meeting of the Liverpool Architectural Society, at the Royal Institution, Colquitt-street, the President, Mr. Parslow, F.R.I.B.A., delivered an address containing much suggestive matter. After a few introductory sentences the President said,—There is a tendency among some of us to keep to engineering and such solid business, and a disposition to disparage the artistic, while there is also, we are conscious, a tendency, among others, to overrate the artistic; but this is the exception. There is a wide field for the artist and his pursuits, and there is also a wide field for the engineer. The architect, whatever may be his preference, has to combine both. Slaves to the useful are apt to neglect the beautiful. The necessities of everyday life press upon us the observance of the one; but the other, the cultivation of the beautiful, is apt to be pushed out, and it is for those of us whose vocations call specially in this direction to see that it is not. The Grecian Emperor when asked to play the lute replied contemptuously he could not fiddle, but he could turn a small city into a large one; and this emperor has many who echo his sentiments, and apply the word "fiddlesticks" to attainments which they do not appreciate.

"What is the use," contemptuously said a poor woman to a lady candidate of an important School Board, "of teaching our girls drawing when they are only going to be servant-maids?" "Well," replied the lady candidate, "the great objection to servant-maids of the present day is, that through rough handling they break valuable glass and china put into their hands. They lack the delicate touch necessary for the right handling of them, and there is nothing so calculated to cultivate this delicate handling as the art of drawing, and hence it qualifies them for whatever may be their position in life."

Even the audience this lady had was able to appreciate the force of such reasoning, and the value of refining our rougher tendencies will by the force of circumstances become known in due time to the public, and those whose education teaches them this must not be unfaithful in times when the necessity is not generally admitted.

If a character like Ralph Nickleby has the command of money, and has nothing about him of a refining tendency, rubbish and dirt where there might be ornament and comfort, gloom and overcrowding where there might be sunshide, the demoralising habits will show themselves in the outward life.

While it is possible, and undoubtedly is the case, that candidates for School Boards have sometimes carried their crotchets to extremes, and have overdone teaching, so the artistic may be overdone, and the extreme must be avoided; but as doctors watch the tone of health does not diminish without their raising a cry, and as our literary guides do not permit declension in literature without an effort to keep up the standard, so the architect should see that the tone of public taste in building does not decline without a vigilant effort to raise it. Goldsmith, in his poem on "The Deserted Village," raises a cry on behalf of Poetry in which we may hear a faint echo on behalf of her sister art.

It is pleasing to observe the number of buildings going up around us, all giving evidence of skill and development in artistic power among the architects of our city.

We remember the time when a distinguished town councillor said, "Architects in Liverpool! Why there are no architects in Liverpool." There was sufficient in those days (twenty-five years ago) to rebut such an assertion, but now there is a great deal more. The citizens have reason to be proud of their buildings, rising up on every hand under the superintendence of Liverpool architects.

We are highly pleased to have in our midst buildings by the privileged architects of London and elsewhere; but we note that the buildings of our fellow townsmen show that the necessity does not exist to go out of Liverpool for architects in every way qualified for such work.

When an architect from outside Liverpool obtains by competition the commission to erect public buildings in our city, we congratulate and welcome him; but where buildings are erected for public purposes, the business of which will be supplied by Liverpool enterprise and Liverpool money, and an outside architect without competition is appointed to the work, we feel the mistaken notion of the town councillor still exists.

We have observed some disparaging reference to the decision of Government not to remove our present post-offices, their decision being to re-arrange by extensive alterations the present buildings. Whatever may be said as to the convenience of the principal business bodies among us, and of the disappointment at not having another handsome building in our city, such as would be an ornament and a credit, as we may be sure would be the case, yet there is a view of the question that those of us who are architects cannot fail to notice. The position for a half-century of an important centre like a post-office gives value to the property around, and many properties are acquired with the knowledge of the advantages consequent upon the position of such a building, the removal of which would be an injury to them, and, therefore, while some regret the decision of the Government, many will have cause for congratulation.

We have known a divergence like this diminish the value of property 75 per cent., while sites, as in Victoria-street, have gone up 75 per cent. owing to improvements. Recently, a property which a gentleman refused to take for 400*l.* five years ago has sold for over 30,000*l.* This is owing to improvements in the vicinity.

When owners suffer through a divergence in their vicinity there is no compensation for them, and when owners gain advantage in a contrary direction there is no tax upon them to make a *quid pro quo*.

To come down from the consideration of the larger erections, we see a curious prospect for the building community.

"Nobody of any means will build now for investment, it is not likely," said a wealthy contractor to us recently. This contractor's conclusion was, that it had long become a by-word among us that to get reasonable interest on building is now out of the question, and certainly we see farms with hundreds of acres offered to any one who will occupy them and pay the rates, or to any who will keep them in order.

Others are offered without any restrictions, free for a certain term. Houses in our suburbs are offered free for so many months, and then for occupation at quite a nominal rent. What is the cause? Who are to blame? And what are the lessons? We have seen the same thing in commercial matters. Ships taking freights that will not pay expenses, let alone bring a return to the owners, imported goods selling at so much less than it cost to bring them to England, and the commercial men engaged in the transactions tell us that it is impossible for them to do otherwise. To do no business they say would mean greater loss. Yet these commercial matters have been quickly righted.

A few years ago the proprietor of a manufacturing mill where we were doing some work said it cost him 10,000*l.* a year to let his mill lie idle, but he preferred to let it lie idle than work it at what was the state of trade then. But ultimately these manufacturing difficulties became settled; and the present state of the building trade, though some blame the public, others the builders, and others again building societies, may be explained in the fact that a wave of adverse circumstances has passed over the land impossible to restrain, like a wave of the ocean, and this has culminated in the present state of the building trade, and as the ebb tide follows the flood in the ocean, and has been repeated in the commercial world, we may look for a receding tide bringing things to their normal condition in the building world likewise. Meanwhile, there are some admonitions to building societies and those who pull the strings in like organisations. Building societies have lent money to speculating builders, we are afraid, too indiscriminately. These in numberless instances have been unable to meet their obligations, and the mortgagees have seized the properties and let them for any nominal sum, so as to bring a return; and so general in all parts of the country has this experience become that all good property duly paid for in suburban districts has had to come down in rental value to compete with this class.

Building societies have missed their purpose, and in the future their projects will require restraint. The object of their promoters was to enable prudent people to acquire their own houses in due time and at moderate cost. But their aims seem to have become misdirected. Their advantages have been sought after in ways never contemplated, and for the present the societies have defeated their own object, and have built up a state of things that is like the monster in the fable with which the celebrated authoress has favoured us. The hero is said to have created a hideous monster, and by some marvellous means put life into it. This monster followed its own creator with a dagger all round the world, until at last the man was slain by the object of his own creation. So, building societies are at present succumbing to the state of things they have themselves created. We have known one building society recently write off 8,000*l.* at a sweep to get rid of responsibilities arising from circumstances as explained. Others besides building societies, including ourselves, may find lessons from the like experience of the past, but we cannot dwell upon them now. Every branch of the building trade suggests topics for useful reflection, and which we hope may be matured in papers and discussions during this session.

We must all be pleased by seeing the action of our Government relative to the manufacture of white lead. This very useful article,—one which we have considered so essential in the work of an architect,—on account of evils in its manufacture is calculated to afford us pain in its use. To obtain the oxide from the pure lead, and which constitutes the white-lead, it is necessary, as most of us have witnessed, to store the pure material soaking in the acid in partitioned apartments for months, and the effects on the atmosphere, as well as doubtless a want of perfect attention to cleanliness in the habits of those in its proximity that are engaged in the works, cause these workpeople in the course of a few years to become physically disabled. How to reduce the evils has now the attention of Parliament, and with all its advantages, if the evils cannot be materially reduced, its manufacture should be curtailed or abolished. The oxide of zinc, the manufacture of which produces no such ill effects, might be a substitute. The trouble that exists in grinding zinc when oxidised might by due attention be diminished. At present we keep to the old practice of using white-lead. People are obstinately conservative in this particular who would abjure the name in politics. If we turn to the zinc in preference to lead, this article would doubtless soon compete favourably in price. Certainly it retains its whiteness purer than lead, and much may yet be learned by experience in its favour as regards the chemical action set up by the effects of the weather. At present we find oxide of zinc is used more in marine and naval architecture, and it is said to prove much more enduring when used for the painting of bulwarks, exposed as they are to alternating wet and dry, than does painting with oxide of lead.

To turn from the painter's line to the brick department, no article has made so much progress in development during the present quarter-century as terra-cotta or ornamental brickwork, and undoubtedly this forms a prominent feature in the architectural work of this generation which may yet develope a new style. At the Building Exhibition in London, a great variety of specimens from different makers and manufactories was exhibited, all showing the wonderful progress towards perfection that is being achieved in this art. And during the recess the Fellows of this Society paid a very entertaining and instructive visit to the well-known works in Ruabon, where, through the obliging courtesy of Mr. Edwards and his son, the successful manufacturers, we were astonished and gratified both by the character of their work and the development of the appliances and machinery for its execution. We have an admirable specimen of this material in the Eye and Ear Infirmary buildings of this city, the architectural work of our excellent friend Mr. Ellison.

We may appropriately turn from the subject of brickwork to that which so seriously disfigures its brightness in all our cities, viz., smoke,—although, by the way, the chemical action deteriorating the surface of terra-cotta is as nothing in comparision with its effect on the generality of stone, and this must ever be a high testimony in favour of terra-cotta. How to lesson the amount of smoke hanging over our cities is one of the important questions of our day; and really one is disposed to say it need be, when we find that the weight of carbon hanging over the City of London is estimated by an eminent professor at 60 tons.

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A very important exhibition of contrivances to diminish the evil has been held in South Kensington, and another in Manchester. We see no reason why there should not be one in Liverpool before long. In some large residences, as, for instance, Biddulph Grange, near Congleton, the flues of the whole of the establishment pass underground, across the estate, to one immense and ornamental tall chimney. This system, however, while it concentrates carbon, cannot materially diminish it. What might be done by collecting it as we do drainage, and consuming it at different stations, may yet be proved. But who is to have the honour of inventing the only successful open or closed grate that will consume its own smoke and do its work of heating in the most economical and convenient method? It may prove that some patent fuel or gas may accomplish what is required. The many who have been giving this subject attention, and the numerous representatives of public bodies that have visited the exhibitions, show how widely interest in this subject is spreading.

The vexed question of light and air is now likewise one of the subjects of the day. We have reason to believe that our worthy ex-president may be relied upon to bring this before us during this session in the way its importance deserves. It is too soon to give an opinion upon the labours of the committee of the Royal Institute of British Architects, so generously undertaken, but there cannot fail to be much good come out of them, and all right-minded members of the legal profession, as well as of our own, will be glad to lend a hand in assisting, as far as possible, to put aside the dog-in-the-manger policy of the past, as well as to secure, with reasonable expense and trouble, the protection of undoubted rights. We frequently hear surprise expressed at the variations to be met with in the testimonies given by professional witnesses. We meet with people who wonder why there should be professional men found to witness on both sides of a question. They forget that the occasion of a dispute is in the fact that there are two sides to every question. To witness against conviction of the truth admits of no excuse; but that two professional men should be found to witness in opposite directions is not at all to be wondered at. The cause of antagonism is often misunderstanding, and the object of law, then, is to get at a settlement of where the misunderstanding exists. That which is subject to variable conditions occasions difference of opinion. In a recent assize, a case was heard relative to the former seaworthiness of a vessel now lying at the bottom of the ocean. There was a wide difference in the testimony of the experts, some engaged on the one side to prove one thing, and some on the other to prove the reverse. But it transpired subsequently that the witnesses on the winning side had access to far superior sources of information than had the witnesses on the other, and herein was the occasion of the difference in their statements, and doubtless the witnesses on the losing side, on calm consideration, would be convinced on which side was the right, but it required the conflicting testimonies notwithstanding to get at where the truth lay. If the matter in question is simply what is strong enough for certain purposes, that may be settled by reference to rules and fixed data, the result of experience, and if in witnessing in such a matter there is conflicting testimony, the truth may be got at, and should be got at, by cross-questioning. The same as to the obscurations of light. If the question be on the subject of expediency, here conflicting testimony will arise.

We have known one of the first architects of our generation to attest strongly in favour of Roman cement for outside work, and would have Portland cement that had been used knocked off in order that Roman might be substituted. This shows how wide a difference as to expediency will exist in the minds of experts. The professional witnesses, if of suitable calibre, can, if cross-questioned, give good reasons for what they affirm in matters of strength and expediency; but if the question is a matter of value, this depends upon such varying circumstances that, like the facts relative to the ship at the bottom of the sea, the truth can only be got at after weighing the conflicting testimony. The light appears after striking the flint. We have already referred to a property which, though offered five years ago for 400*l.*, was recently sold for over 30,000*l.* The professional witness who might have said five years ago that that was its prospective value would have created a sensation.

If the question is a matter of sanitation,—what is good for health and what is not,—then a subject is started on which there are as many opinions as witnesses. And that there should be architects found to witness strongly on both sides of such a question is no disparagement to their veracity, but merely a reflection of the now well-received axiom that doctors differ. Those who conduct inquiries should get at what is available evidence to prove a conclusion. The mere statement of a professional witness that his opinion is so-and-so should not be accepted without his giving his reasons why, and the truth could soon be got at. Who is there among us that has not had his opinion changed, as careful barristers have brought forward appropriate facts, opinions that when formed were perfectly conscientious?

Much has been done in our day to provide open areas as lungs or breathing-places to assist the vitality of residents in our large towns, and a considerable amount of property, unfit for human habitations because of its condition excluding the light and air of heaven, has been removed. Our City Corporation has striven with almost insurmountable difficulties, most commendably, in this direction, and yet our lamentation is that, go where we may, we find that while our authorities are doing away with the evils of the past generation, we are rapidly multiplying the same evils to be dealt with at the same enormous expense by the next generation. Echoing the sentiment, posterity has done nothing for us, so we will do nothing for them. Small houses are being erected, not, we should judge, as a barrister said, at so much a dozen, but so much the hundred gross. These small dwellings are accumulating as thick as mushrooms, and no open spaces are being provided to aid health or cut off the spread of pestilence. Such open spaces might be provided at infinitely less cost now than hereafter. Additional legislation is certainly needed in this direction, and the strenuous efforts of individuals who come in contact with this state of things should on no account be withheld to secure some improvement before it is too late. The condition near our own city of Marsh Lane and Seaforth at this time reminds us of a plague of locusts just alighted upon a verdant spot, and determined not to leave it until every mark of verdure has been eaten up. Cannot something be done before it is too late to provide more public spaces? Houses that might prove a boon to our city as constituting dwellings for the labouring classes, and for the want of which London and Paris are now crying out, may prove a chain of woe, promoting death instead of nourishing life, through shutting out the essentials to life.

To turn more particularly to local subjects. It is a matter of satisfaction that our enterprising Corporation has resolved to add to the appearance of St. George's Hall by completing the outside sculpture. All will be pleased to know that the gentleman whose models were chosen from the number contributed in competition has been appointed to execute the work, and, though a comparative stranger to most of us, there seems every reason to believe the work entrusted to him will be carried out creditably to himself and to the noble building with which it will be associated, as also to the city of which this is essentially a municipal transaction. We must congratulate Mr. Stirling Lee upon his success. We understand he has been pursuing the studies of his art recently in Paris. The evident enthusiasm with which he has approached the task assigned to him, and the skill he has already shown, afford bright prospects for the future.

The Mersey Tunnel is another undertaking, though of private enterprise, naturally attracting considerable notice. Our townsman, Mr. William Williams, in the memory of some of us, approached the late Emperor of the French on the subject of a tunnel under the English Channel, and produced his models for a tubular structure of clever design with ball and socket-joints of an exceedingly interesting scientific and creditable character, and had the Emperor remained in power the matter would doubtless have received more of his attention. Subsequently there seemed great probability that the same system would be applied for carrying a tunnel under the Mersey, and the preliminary Parliamentary notices appeared in the papers. But since then, instead of laying a tunnel, the project of boring a tunnel under the Mersey has been undertaken with a spirit and enterprise worthy of the importance of the object, and the work is now satisfactorily progressing. The question of such a prodigious undertaking as forming a tunnel under the Mersey could only commend itself to us when the exigences of the community necessitated the step. Many have said,—Why was not the railway communication that occasioned the tunnel from Edge Hill to Liverpool obtained by purchasing the land years ago and opening up the whole to the heavens then, instead of waiting and opening it up now when the cost is so much greater? The answer that suggests itself is, that there was not enough business then to justify it, and not the same culmination of identical interests at both ends of the tunnel years ago that there is now. And what leads to the necessity of the Mersey tunnel now is the culminating of identical interests at both ends calling for such a means of joining them. No such tunnel would have been dreamed of for passing under water were there no such important identical interests. And though the subject of the English Channel tunnel is beyond the limits of this address, we may state our opinion that the necessity for such an undertaking to commend itself to wise men must show culminating identical interests on both shores. The interests must not merely be culminating, but must be identical, and to commend itself to the national mind there must be some guarantee that the interests will remain identical.

We have had progress reported in the scheme for supplying this city with water from Vrynwy, and in which our esteemed member, Mr. Deacon, has so important a part to perform. The seven miles of piping laid offers some little indication of when we may expect the works to be complete. The engineering difficulties already got over are gratifying, but to form a reservoir with nearly two square miles of area is still a formidable matter. We hear very little of this, and it is well it is so. There are few who understand as do architects the need of silence, while work is in progress, from outsiders and lookers on. Usually they are jubilant at the commencement, perplexing and often indignant at what they see in progress, then jubilant at the completion. An unplastered apartment is always less than they expected, and not half so high or light as needful. We are jubilant at seeing an army start for Egypt, impatient with the delay of preliminaries, then again jubilant on seeing the result, and many a small battle is fought in building operations, and every such operation is like a life: the infancy, the patient growth, the ornamental finish, all comprising the maturity. We trust Mr. Deacon may find circumstances favourable, and that no insurmountable obstacle may overtake him and those associated with him. While this great undertaking is being pushed forward by our city to supply the wants of more than half a million people, in the city of London already there is agitation for increasing the water supply for that immense population by an entirely different means,—to catch the rain-water and adapt this to household purposes; and the best means of doing it is now a prevailing question, and with all the great water schemes afloat in our country the immense boon we possess in a copious rainfall should not be overlooked as a supply for drinking purposes. Among the subjects of local interest an important one is the suggestion of providing in our city waiting-rooms for ladies: if not dealt with by our authorities this will be a matter for private enterprise. The vast increase in the city of female occupation, shop assistants and lady-clerks, all very proper, to say nothing of the continually-increasing number of visitors, travellers, and ordinary emigrants passing of necessity to their destination through our port, and yet nothing in the form of waiting-rooms for ladies, is a state of things admitting of no excuse. Waiting-rooms, with a small charge, would pay considerably towards the expense of those that are free. But pay or not pay, the rate-paying community has at least as much claim to such institutions as have the equestrians to our local Rotten Row.

We are glad to notice the names of those who have formerly been connected with this society as they come before us in their new spheres. Mr. Shoolbred, who has been lecturing during the recess, and Mr. Ladds, who figures in the architectural world, were both formerly members with us. We have observed likewise with pleasure our much-respected

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member, Sir James Picton, as president of the British Archæological Association, and in that capacity lecturing in the south of England. In honouring Sir James by this appointment to fill the place of an eminent nobleman, the society has honoured itself. The late Lord Brougham was on one occasion advised to content himself with doing the work of four ordinary men, and we have at times thought similar advice might be given to Sir James; his gifts and tremendous application make us justly proud of him as a fellow-citizen and a member of this society.

Let us, then, conclude these somewhat discursive observations by a few words of encouragement. A worthy literary friend, having a taste in early life for the violin, was told by his master that to succeed he must serve an apprenticeship of seven years, practising ten hours a day, and then he might expect to know a little. Let young architects likewise realise what is before them, and cultivate the power of executing artistic sketching and design in all their multifarious branches, Gothic and Classic, Mediæval and Ancient, and practise the modes of executing such work in pencil and pen, colour and crayon, and likewise seek acquaintance with the most natural as well as approved methods of construction; and acquire a facility to calculate the various strains, breaking, crushing, and safe weights of all the known materials under their varying circumstances; understand the many kinds of timber and stone, metals, and materials of all descriptions; acquire familiarity with all the various artificers' work, bricklayer and mason, carpenter and ironfounder, slater and plasterer, plumber and painter, glazier and decorator, efficiency in any one of which it takes the artificer himself a lifetime to acquire; and learn the technicalities of the measuring and pricing in these various trades, of which the artificer himself is in many cases uninformed; study sanitation, ventilation, and the jurisprudence of building, Building Acts, Fire Prevention Acts, Sanitary Acts, and all the Local Government Board requirements, the light and air, the party-wall and compensation cases; start with the level and theodolite, and study the technicalities of land surveying; and by the time they have further learned what are the requisites for good planning, in all the known requirements of modern dwellings, ecclesiastical, manufacturing, and public buildings, they will, at any rate, be ready for starting business on their own account.

Knowledge is power, and the duly-qualified architect should not be among the least powerful in the community.

ARTISTS.

In our "Post-office Directory" and "Court Guide" the mysterious italics affixed to a householder's name stating him to be an "artist" are amply sufficient to designate to the public at large the profession of an individual who paints pictures, and, in the height of his glory, is a member of the Royal Academy. This very vague term of "artist," in fact, is fully accepted in our country as being applicable, almost exclusively, to a painter. We well remember a lady of some social importance once declaring that she would not allow her daughter to marry an artist, but she would be very willing that she should marry an architect. Fortunately, however, there are many of us who are better acquainted not merely with the correct acceptation of the term, but who are perfectly well aware of the absolute importance of the aid to our happiness and prosperity that is secured by the work of the artist, as architect, painter, sculptor, engraver, and musician. It is not, however, every follower of these universally-admitted branches of the fine arts who is entitled to the dignity of being regarded as an artist, and here it is that the true acceptation of the word makes itself felt. Every painter is not necessarily an artist, while the humblest artisan, by some creation of his brain and fingers, may show himself worthy of the highest praise as an artist. Readers of that ever-delightful classic, Walton's "Angler," may, perhaps, remember how on one occasion Venator apostrophises the talk of Piscator as that of an artist. Here, of course, we meet with the term used in one of its original meanings.

In the past, the term "artist" was applied, we know, to any one who had studied the liberal arts at the University, a relic of which we still see in the familiar degrees of B.A. and M.A., retained in our educational system. The meaning of the term is, of course, traceable to the original Latin *ars* from which our word is derived (whence the Italian *arte* and the French *art*), and which scholars have regarded as only a contraction of the Greek *aretè*, virtue, merit. Following up, however, this derivation, it may be observed that modern philological research has rather attached the word to an origin more indicative of the classic acceptation of the term as signifying industry, manual skill, the Sanskrit *kri* and *kar*, to make,—whence the Latin *cre-are* can distinctly be traced.

All this, however, is entirely beside the question, though it may tend in some measure to explain the somewhat confused meaning generally attached to the word "artist"; and yet the confusion exists alone in our country. In Italy, the word "artist," in our sense of the word, is unknown, the architect, the painter, and the sculptor, being respectively and invariably known by no other terms than *pittore*, *scultore*, and *architetto*; in Germany, the distinction is equally marked, the generic term of artist (*Künstler*) being applied when used alone to the actor. With our French neighbours, again, where the distinctions of painter, sculptor, and architect are equally well marked, the terms will be occasionally found united, as *artiste-peintre*, *artiste-sculpteur*; the word *artiste* used as with us, alone being accepted as applicable to the actor and actress,—as a contraction of the expression *artiste dramatique*. Our French friends are, however, fond of uniting the fascinating word with many of their neater branches of industry.

In all four languages, French, German, Italian, and English, the term "artist" in its general acceptation is the same. We, like our Continental neighbours, understand thoroughly the meaning of the praise that a *primâ donna* sings like a true artist, or that a book is the work of a thorough artist.

Art has, of course, over and over again, been very pithily defined; it is skill reduced to theory, says one; it is nature interpreted by one soul for other souls, says another; it is man added to nature, says a third, and so on, while the artist has also been epitomised in a no less numerous series of questionable definitions. It will, however, we think, be universally admitted that the title is merited by any one who manifests in his work a marked individuality, and succeeds in impressing his creation with anything of his own character; and here it is that the architect,—whom some consider as not deserving the title of artist,—may so essentially be said to be an artist, because the materials at his disposal afford him those means of displaying that subtle individuality which, when successful, ranks highest among the qualities of art, and this though he may never have put hand to brick or mortar, more than the sculptor has touched the marble for which he has modelled the clay, reproduced by his Italian *abozziatore* paid at so much a week,—anent which point, by the way, we are likely, before many days are out, to hear a great deal.

The question is, indeed, a most subtle one. If we are to accept the dictionary definition of an artist as distinguishing the architect, the sculptor, the painter, and the engraver, professors of the liberal arts, from those employed in the mechanical arts,—carpenters, jewellers, &c.,—the veriest daub on canvas, the most ghastly attempt of the modeller in clay, is more the work of an artist than the door-knocker wrought by a Sansovino, or the cup chiselled by Benvenuto Cellini. In those happy times of the Renaissance and the earlier Mediæval and Classic days, distinctions between the artist and the artisan were unknown. The great artists felt none of our modern touchiness as to their position. Great painters kept in Italy their *bottega*, or shop, and executed any commands their customers might require. This now so apparently incongruous union of art and trade which marked the past was the very cause of the beauty which distinguishes everything produced in those distant days. The beautiful and the useful were then inseparable, and decoration, that bugbear of the present day, sprang from absolutely rational necessities. To the union of art and industry in the past we owe the marvels which fill our museums and overcrowd some of our houses. The proper understanding of the respective relations of art and industry lasted till the seventeenth century, when the painters in France separated from their Mediæval corporation, and founded the Royal Academy of Painting. From that day, as has been truly said, dates the rise of the separate aristocracy of architects, painters, and sculptors, the divorce of art and industry, since Classic days known but by one name, while a strong undercurrent set in of disunion between the great artistic professions, and to which, in no small measure, may be said to be due the existence of any doubt ever being expressed as to whether the architect be an artist.

If, however, such a doubt should be expressed, unless it be dictated by those personal feelings which, it is to be regretted, are known to exist, there is no small degree of thoughtless irreverence in such a doubt being sent forth to the world from an authoritative source; for, if we do not all understand exactly what constitutes an artist, no shadow of a doubt can exist on the point that some of the greatest artists that have ever breathed have belonged to the architectural profession.

THE MANCHESTER SHIP CANAL.

Manchester has not confined herself to talking about the ship canal; she has bestirred herself in earnest. The country between Manchester and the Mersey has been independently surveyed by two professional men. The plans have been laid before the provisional committee, accompanied by a report from Mr. James Abernethy; and the principle which we pointed out (on June 24th and July 8th) as the only available one, that of a high-water basin at Manchester, communicating with the Mersey by a canal furnished with locks, has been unanimously adopted. At a large meeting of the promotors and guarantors held in Manchester on the 26th ult., the recommendations of the provisional committee were adopted without a dissentient; and it was decided to take the requisite steps for raising the funds, and applying to Parliament for power to carry out the project.

We cannot recall an instance of any projected work in which the prospect of economical return has been so large and so distinct. The imports and exports of Liverpool now form very nearly one-third of those of the United Kingdom. From an analysis of the exports from Liverpool in 1880, "it is clear," says the author of the pamphlet on the proposed ship canal, "that by far the greater proportion of Liverpool exports must proceed from Manchester either directly or in course of transit." The import trade must follow pretty closely the same lines. That some 100,000,000 tons of merchandise pass in the year to or fro between Manchester and Liverpool, then, there is little room to doubt. But take it at fifty millions. On every ton of this enormous quantity, according to the uncontradicted evidence before the Select Committee on Railways (Rates and Fares), at least 5s. is paid for transport more than need be paid if the inland water-communication were open. But this comes to the prodigious tax of 12½ millions sterling on Manchester. Looking at the price alone, with our estimate of quantity, we can put it in another way. We suppose that would be accounted a very small trade which exported only twenty tons of produce per annum. But take a business of that magnitude. Now, in a joint-stock undertaking of any kind, the condition of success is, that every member should so act as if the whole prosperity of the undertaking depended on him, as far as his powers and engagements went. Thus each shareholder should look on his subscription as essential to success. Hence it follows, that for every twenty tons of produce that he exported or imported it would pay a Manchester man five per cent. on a 100*l.* share, if the canal were made, even if he never received a penny by way of dividend. This consideration we beg leave to commend to all those interested in this great work, and we venture to think that alone, and unsupported by any other argument, it is enough to cause the eager covering of the subscription.

The Proposed United Drainage Scheme for the Black Country.—At a meeting of the Wednesbury Local Board on the 23rd inst. a resolution was passed approving of a united drainage scheme for the parishes of Wednesbury, Darlaston, and Tipton, and a small portion of Sedgley. Mr. Pritchard, C.E., estimates the carrying out of the scheme to cost 79,500*l.*

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THE PROGRESS OF THE DECORATIVE AND INDUSTRIAL ARTS.

Mr. William Morris, speaking at the opening of the Fine Art and Industrial Exhibition in St. James's Hall, Manchester, on the 21st inst., in response to the toast of "English Decorative Art," said,—Some twenty-five years ago these arts of mere decoration were in such a state that one is bound to say that they looked as if they were coming to an end; of the traditional part of them there was, in England at least, scarce any more left than there is now, *i.e.*, nothing. On the more obvious and self-conscious side there was nothing stirring. What individual talent was left could only show itself in eccentricities that most often deserved to be called by any other name rather than decoration. The public was as blankly ignorant of the history of the art as the designers were of its first principles. The contempt with which the whole subject was treated in those days is shown pretty clearly by the law which relates to the copyright in industrial designs, which, strange to say, is to this day all the protection accorded them. The framers of that law doubtless wished to secure to manufacturers all reasonable advantages for those designs which they had paid for or invented; yet to this day it is only possible to protect such design for three years; three years seemed at the time when that law was made ample time for a manufacturer to reap all reasonable advantages from any design he might produce. Certainly an advance has been made, a reaction from ugliness to beauty has touched at least some part of the people who live among civilisation; and in what we technically call the decorative arts, this new Renaissance has been helped in this country by many agencies, not least among which has been the steady endeavour on the part of the Department of Science and Art to spread artistic education among the public in general. Some of the results of this new Renaissance are now before the people of this great city: any one who chooses can make the interior of his house comely and pleasant without an unreasonable expenditure of time and trouble. I am always asking myself,—Is this apparent success real? Is this seeming advance of a quarter of a century going somewhere or nowhere? That is a serious question, to which it is impossible to answer, ay or no. But, after all, to us as practical people, it does not matter much whether it can be answered directly so long as we see clearly what are the conditions of the health or disease, the life or death of our art,—in short, so long as we can see what work is immediately ahead of us to maintain our art in a hopeful state. Now, to my mind, it is not so very difficult to see this. Firstly, we have, to put the matter in its simplest form, to interest the whole public in the work. That once done, the whole public will see to this matter. Well, that is easy to say and very hard to do. These decorative arts, when they are genuine, real from the root up, have one claim to be considered serious matters which even the greater arts do in a way lack, and this claim is that they are the direct expression of the thoughts and aspirations of the mass of the people; and I assert that the higher class of artist, the individual artist, he whose work is, as it were, a world in itself, cannot live healthily and happily without the lower kind of art,—if we must call it lower,—the kind which we may think of as co-operative art, and which, when it is genuine, gives your great man, be he never so great, the peaceful and beautiful surroundings, and the sympathetic audience, which he justly thinks he has a right to. If you compel a Michelangelo to live in a world of dullards and blunderers, what can happen to him but to waste his life in ceaseless indignant protest, till his art fades out in sour despondency and his whole career has turned out a useless martyrdom? Great minds need no slaves to rule over, but rather fellow-workmen whom they can help and be helped by. So I say that the decorative arts are as necessary to our life as civilised men,—nay as men,—as the more strictly intellectual arts are, and that which has become our end and aim, to wit, the new birth of popular art, as, on the one hand, it is a most arduous, so, on the other, it is a most worthy undertaking. Such great works both make the utmost courage necessary and inspire us with the necessary courage for carrying them out. I am afraid I must admit that the public in general are not touched at all by any interest for decorative art; a few of the upper and middle classes only have as much as heard that there is such a thing as decorative, which should be popular, art. Time was when all manufactured wares had some claim to beauty, and, other things being equal, the most beautiful thing was the most marketable. I fear we cannot say that this is the case now. Pray excuse me for drawing an illustration from a very interesting and useful class of goods to which we are none of us strangers,—printed cottons. If you turn over the pattern-books of this or that cotton-printer in this city, you will find many patterns which are exceedingly pretty, while some of them are exceedingly—well, ugly, as, I am sure, the gentleman who prints them will admit. Now, having the honour of the acquaintance of a cotton-printer in this city, I am able to say that, so far as I could understand, the ugly patterns sell quite as well as the pretty ones. Now, you know, if the decorative arts were in a healthy condition, instinctive good taste would refuse the ugly patterns and demand the pretty ones, and so prevent what I must consider a degrading waste of money, time, and intelligence; for what in its way can be more wasteful than using all the accumulated knowledge and skill of centuries in spoiling the fair white surface of a piece of cloth by putting a pattern on it which you know to be ugly? And in like manner it fares with all the other industrial arts. If a manufacturer determines to be also somewhat an artist,—as he most certainly should be,—and to turn out nothing but what may do credit to his own reason and intellect, he must also make up his mind to give up a great part,—probably the greatest part, of his business; and I will say at once that if a good few of our makers of common wares were so much touched by the importance of the decorative arts of England as to do this, it would mark a new era in that advance of the art which I have been speaking of; and if we could add to such a sacrifice of apparent wealth an obvious and lively interest on the part of the public in the processes and methods of the art, I do think we should be nearing our goal. For at present the divorce of commercial manufacture from art has made the public bad marketers; too often they do not know what they are buying, and it seems to be generally believed by a people to my mind somewhat overdone by machinery, that works of minor art can be and are turned out like the sausages in the mythical Yankee machine,—live pig at one end, sausages at the other. The divorce of commerce from art has been wasteful of more than the works of man's industry, and in many places,—and I must say nowhere more than in South Lancashire,—has made the advice which we must always give to all students of art, to go to nature, somewhat of a mockery. Believe me, I do not speak of this or any other evil wantonly, but with the hope of, in my small way, encouraging those who are fighting against it; and, indeed, fight against this evil we must, if we are to have decorative or any other art for long. The choice lies before us: Which will you have, art or dirt? In the long run, I believe you will find art the cheaper of the two commodities; for if we choose dirt we shall make England, all of it, sooner or later, what it was not meant to be, an uncomfortable country, and discomfort breeds discontent, and discontent,—what will that bring forth in this land of stout-hearted men? This is far from being beside the question; it is English decorative art I am speaking of, and can we forget what the country is like which bred that art as it once was, which has made an ancient English house, for all its simplicity and rudeness, the loveliest of the habitations of man? Surely my voice is speaking the thoughts of many people when I plead with the mighty and overwhelming commerce of England to spare the source from which all English art has sprung, what is left us of the land of England, with all its growth of familiar beauty, sweetened every acre of it with the memories of the men that made us. When that plea is listened to, and we make up our minds, first, to keep all we have left us of fair and unspoiled country and dwellings, and second, to replace what we have lost by a reasonable and living art which shall really express our lives and their aspirations,—I say when we have made up our minds to do this, then is all gained. Nature, which has covered with her kind hand the battlefields of the Edwards and Henries and Charleses, will, in one way or another, when we call upon her, do no less for the battlefields of commerce. Our scientific men, who, to me, an outsider, seem able to do anything they care to do, will have shown us the right use of carbon and sulphuric acid, and the sun will shine as brightly through the boughs outside the factory windows in Lancashire as it does through the Kentish hop-garden. I think those days will come, wild as the prophecy seems. We shall not see them. Who cares, since we amongst others shall have worked to bring them about? Nor will anybody in those days need to talk about English decorative art, for every one will have it ready to his hand; like the company of a friend with whom one can talk if one wills, or be silent with if one pleases, so restful, so familiar, shall it be.

SUSSEX ARCHÆOLOGICAL SOCIETY.

LEWES CASTLE AND PRIORY.

The Sussex Archæological Society on the 19th inst. held a meeting at Lewes, where the members were hospitably entertained by the Mayor (Mr. Alderman Wynne E. Baxter). Afterwards assembling in the Keep of the Castle, they listened to a paper by Mr. G. T. Clark (read for him in his absence by Mr. Somers Clarke, jun., F.S.A.), who has recently investigated the castle. The paper was stated to be a rough draft only of a more exhaustive paper which he has in preparation for the Sussex Archæological Society's next volume. The paper read contained a description of the topography of Lewes, and hazarded the conjecture that the name Lewes was of Celtic origin. It pointed out that no settlers could long remain blind to its strategical advantages, and described the natural features of the ground occupied by the castle, Mr. Somers Clarke illustrating the same by exhibiting an Ordnance map, showing that the castle and precincts covered two mounds and the connecting space. It appears uncertain whether the Britons took advantage of the facilities offered, and fortified the spot, or whether it was some Saxon horde who first did so. After pointing out the details of the Norman work, the paper proceeded to explain the obvious necessity that existed, from a military point of view, to fortify the mound on which the company were assembled, and the other mound, known as Brack Mount, although it is believed by Mr. Clark that no similar example exists of a castle with two mounds, each surmounted by a keep, as was formerly the case at Lewes. The written history of Lewes from the time of Ceadwalla, who founded a college there, was briefly touched upon, and the remark made that no notice of the castle appears in the Doomsday Book. Mr. Clark is of opinion, however, that William, son of William de Warrenne, found a castle fortified upon the spot, and that the existing masonry was the work of the Earl Warrenne, or at latest of his son and successor, and that it has been but little altered. The Earl of Warrenne had little to do with the building of the towers. The keep is formed of a shell of masonry some 10 ft. or 12 ft. thick, placed upon the ground without any other foundation, a form of construction which, it was pointed out, was very faulty when mining was the usual mode of attacking such fortresses. The keeps were connected, it was explained, by two curtain walls, deepest at the most vulnerable points. The shell of masonry surrounding the Brack Mount, Mr. Clark was of opinion, was less important. The moat, part of which is now filled up and cultivated as a garden, the site of a supposed postern, and the entrance from the town (thought to be but little altered), were all also noticed. The barbican was minutely described, and the peculiarity of the cruciform loops with short cross-bars pointed out. It was suggested that a passage, supposed to lead from the postern, should be cleared out. It was also remarked that a staircase to a Norman shell keep was unusual. Attention was called to the remains of a vast fire-place facing towards the interior of the keep, with corbels indicating that the erections within the keep had lean-to roofs. Mention was made of the hall, the chapel, the garrison great kitchen, of which no remains have been found; nor are there the remains of any known well. The next point touched upon was the very perfect Norman vault, 12 ft. square, beneath Mr. Lucas's house, and which is supposed to have been used as a cellar or store for the dwelling of some dignitary of importance, probably of the Lords' hall. The Earl de Warr[illegible] was remarked, possessed

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two other castles besides that of Lewes, and to each was appended a religious house. The characteristic feature of Norman masonry,—the material used being rubble faced with flint,—were dealt with, the fortunes of the De Warrenne family detailed, and some remarks made upon the fortifications of the town of Lewes, which it appears was formerly defended by three walls.

The excursionists having proceeded to the Priory, where excavations are in progress, Mr. Somers Clarke observed that there were several points connected with the plan which could not be accurately set down, as the work had not yet extended to those parts of the site. The history of the foundation was set forth in the Sussex Archæological "Transactions," more particularly in vol. ii., in a paper by Mr. W. N. Blaauw. There was also in vol. iii. a very valuable small plan by Mr. J. L. Parsons, who measured the remains which were discovered in 1847, when the railway was made. The railway entirely destroyed the greater part of the foundations of the church. Mr. Somers Clarke proceeded:—"As there is a pressure upon my time, and as the rain is falling, I will assume that those present are acquainted with the general history of the original founding of the Priory of St. Pancras, and only remark that we all know that the reception accorded to William de Warrenne and his wife Gundrada, at the great monastery of Cluny, decided them to place the religious house they were proposing to found at Lewes under the care of the Clunaic order. They arranged with Hugh, abbot of Cluny, to send over three or four monks, and Lanzo, with three others, came over to England in 1077. We may presume that before the arrival of the four monks the plan of the monastery had been laid out and the works commenced. It does not appear that William de Warrenne intended to found a house of great size. The somewhat modest dimensions of the church, as well as the small number of monks asked for, would both lead to this conclusion. I may here remark that, so far as can be gathered from the measurements of the original church built by William de Warrenne, it was smaller than Chichester Cathedral, which, you will remember, is the smallest of our English cathedrals. The first consecration of the church took place between 1091 and 1097. Probably we shall be able to get at the date a little more accurately." Mr. Somers Clarke here proceeded to explain the plan of the building as he believed it had existed up to the time of the first dedication, pointing out that the church was only 54 ft. in extreme width, internal measure, and remarked that for this fact, together with all other information concerning the church, we were indebted to Mr. Parsons's plan. Allowing for the substantial piers always used by the Norman architects, the speaker said he was inclined to think the building may have been a small one. He had no doubt the remains of the infirmary would be found, and that was a very important part of a monastic establishment, as it was the part of the building to which the aged monks retired when they were permitted to relax somewhat from the severity of the rules of their order. In the time of the third Earl Warrenne a second dedication took place, probably between 1136 and 1147. Mr. Somers Clarke proceeded to give details of the alterations made in the building,—giving his reasons for supposing that the new church had double transepts, as is the case with the mother church at Cluny, and observing that although there was very early documentary evidence relating to the Priory, the number of monks in residence was, so far as he was aware, nowhere stated. Various additions to the Priory made from 1218 to 1312 were then described, and certain events affecting the Priory as given in a MS. in the British Museum, dated 1312, in which mention is made of the building of the great infirmary in 1218, the erection of two houses of the infirmary on the north in 1219, the celebration of the first mass in the Lady Chapel in 1229, and a bequest of 200 marks towards completing the two towers of the front of the church in 1268. From another authority it was also shown that in 1375 there was a bequest for masses to be said in the chapel of Our Lady on the north side of the great church. Mr. Somers Clarke then remarked,—"We have no further information as to the church or monastic building till the time of the suppression under Henry VIII., Feb. 16, 1538, when 'the church, the bell tower,' and 'the cemetery,' are specifically mentioned in the grant to Lord Cromwell, and in the letter dated March 24, 1537, from Johan Portinari to Lord Cromwell. My plan of the church," said the speaker, "is based upon the details given in those letters and on the plan already mentioned, made when the foundations of the east end of the church were revealed in 1847." The details given by Portinari were here quoted, and the different points upon the plan believed to harmonise with these were pointed out. Mr. Somers Clarke then said,—"My plan is based on a contemporary work in our own county, the nave and crossings at Chichester: and it works out very satisfactorily on this basis, but upon the whole on a smaller scale." After giving the supposed measurements of the different portions of the church, and a number of interesting details, Mr. Somers Clarke briefly sketched the history of some of the illustrious personages buried in the church and in the chapter-house of the Priory, and then passed on to speak of the recent excavations. He said the work now done has been to clear the place, and to take much of the earth away from the whole site of the dormitory, and to reveal the great enlargement that was made after the first foundation. A circular staircase was also found in the north-east angle of the refectory similar to the one before known to exist. The London and Brighton Railway Company had courteously sent a representative to inform him of their willingness to place a fence round a portion of the ruins abutting upon the line, and to remove certain obstructions, so that visitors to the grounds might have free access to every part of the existing remains of the Priory. The speaker further said he had to thank the members of the Sussex Archæological Society for the help some of them had given him, but, in reply to some 600 notices sent out, he had only received seventeen contributions. He wished especially to thank Mr. Evelyn Blaker, who had not only given a handsome subscription, but had announced that he would pay any balance there might be on the wrong side, and he (Mr. Somers Clarke) must express his indebtedness to Mr. St. John Hope for having so opportunely come to his assistance and superintended the excavations.

DURATION OF CONTRACTORS' OR ARCHITECTS' LIABILITY.

The French *Cour de Cassation* recently devoted two days to the examination of the above question, which was stated in the following terms:—

"In law, is the action of the proprietor against the architect limited by the expiration of the ten years immediately following the taking over of the work? Or can this action be exercised during thirty years, provided the defect upon which it is founded has revealed itself during the first ten years?"

It was laid down that, according to French law, architects and contractors are exempted from liability as to the past and the future, if the owner of a building has not instituted any suit within ten years from the taking over of the work.

MORTAR FOR MASONRY.

The *Central Blatt der Bauverwaltung* calls attention to a patent composition manufactured at Meissner's factory at Stargard (Pomerania), which has for some years past been successfully employed on the Berlin-Stettin Railway in the coping of counter walls and bridges, the base of water-courses, &c. The substance is composed of coal-tar, clay, asphalt, resin, litharge, and sand.

Amongst other works executed, special reference is made to the coping of a counter-wall which is exposed to the injurious effects of the water running down from a slope 33 ft. in height. Although built four years ago it has not as yet needed any repairs. Other works executed with this mortar have proved equally satisfactory.

In applying this mortar, the masonry for the coping of which it is to be employed is allowed to dry thoroughly, and after being well cleaned is painted over with hot roofing varnish. The mortar is then laid on cold, to the thickness of about three-eighths of an inch, with wooden or steel trowels, and is properly flattened and made smooth. If the surface is an extensive one another coating of roofing varnish is applied, and finally rough sand is strewn over it.

The cost of the materials and labour is estimated at about 5d. per square foot, and it is said that as low a cost as about 4d. per square foot can be arrived at when the workmen have become experienced in the operation of applying the mortar.

THE THREATENED STRIKE OF MINERS.

The resolution that again emanates from Manchester in favour of the strike of a very large body of coal-miners seems likely to lead to more results than did the last, because of the fact that there is not now the element that made the last decision almost impossible to execute. This decision overlooked the fact that a large number of the miners in the kingdom were bound in honour to work during the continuance of sliding-scale arrangements, and it was this fact that gave the chief opposition in Manchester to the passing of the first resolution. That agreed to last week is for districts where the sliding-scale arrangements are not general, and thus it becomes of importance to learn the relative proportions of the workmen and the relative production of coal in the two classes of districts; for it is largely upon this that the probabilities of success in a strike depend. From official statements we are able to give these facts, and to append to them figures that show the strength or weakness of some of the trade unions of the miners, all of which have their bearing on the probabilities of a strike.

The following figures from the returns of the Inspectors of Mines will show the number of miners and the yearly production of coal in the districts where sliding-scales rule,—Durham, Northumberland, and South Wales,—to which is added Cumberland, where an agreement to adopt a sliding-scale is settled on.

	Miners.		Coal Production. Tons.
Durham	73,291	.....	28,500,000
Northumberland	22,740	.....	7,000,000
South Wales	53,452	.....	16,000,000
Cumberland	6,175	.....	1,769,000
	156,658	.....	53,269,000

There are several other districts where the sliding-scale principle is at work at single or associated collieries, or in localities, especially in Staffordshire and Yorkshire, so that the quantity of coal produced and that must be expected to be continued in production under all circumstances, is much above that stated above; but in these four districts more than a third of the whole of the miners in the kingdom are located, and more than a third of the whole of the coal produced in the kingdom is raised. But in addition, it must be remembered that only some of the remainder were represented at the second of the conferences at Manchester. None of the four districts above-named were represented. The official statement gives the number of men represented by the twenty-four delegates as 113,674, or about a third of the miners in the kingdom after those under sliding-scales are taken from the total. In other words, if the whole of the 113,674 represented were to strike,—and this is not the ultimate decision,—more than three-fourths of the miners in the kingdom would still remain at work. The four leading districts in which the strike is threatened are Yorkshire, Lancashire, Derbyshire, and North Wales; and it is added that so far as Yorkshire is concerned, only one-half of the miners are ready to strike. Taking a similar proportion of the coal out-put of the county, and giving the whole of the other districts, the possible strikers are as under, with the coal yielded by their districts:—

	Miners.		Coal—Tons.
Yorkshire	30,000	.....	9,100,000
Lancashire	61,127	.....	18,500,000
Derbyshire	27,422	.....	8,500,000
North Wales	10,100	.....	2,600,000
	128,649	.....	38,700,000

If, then, the whole of these miners in the districts struck; if none of them worked under sliding-scales; and if none of them made arrangements with their employers, a strike would mean, if it were continued for a month, little more than three million tons of coal less produced.

But there is one other consideration,—the number of those in the unions of the miners, for this has its bearing on the probability of the men following out the "notices," and on the financial ability of the miners to endure a strike. Mr. Crawford, the secretary to the Durham

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Miners' Association, states, in his official circular this month, that in Lancashire 9,000 miners out of 61,000 were in the union; that Derbyshire and several other adjacent counties have 300 in the union out of over 49,000; it is stated from a similar source that Yorkshire has only 7,000 out of 60,000 in its unions. Hence, it is clear that not one miner in twelve in the districts where a strike is threatened is a member of the union, and with 128,000 men out of employ,—if it were possible,—the union funds could not endure a week. The districts where the strike is threatened are the worst organised in the kingdom, the hours of work are longer, the wages less; and thus the possibility of the success of a strike that is only probable can be readily gauged and estimated.

AN OLD PARIS HOTEL.

The old hotel in the Rue du Temple, where there had previously been a sum of 300,000 francs in old coins found, continues, as the demolition proceeds, to yield other treasures in somewhat remarkable abundance. Thus, behind the wooden panels of one of the *salons*, some fine frescoes were discovered, which are valued at 25,000 francs. They are in excellent preservation, and admit of being removed without difficulty. Another case is that of a room on the first floor, behind the panelling of which some very richly-carved panels have been found in the finest Louis XIV. style. For these, 75,000 francs were at once offered and accepted. The lead from the roof of the hotel has been sold for 10,000 francs. The plates were so thick that they had to be cut up with special tools on the roof itself before they could be readily removed. The timber of the roofing is all of the finest and soundest oak, which has been bought by carvers, &c., at a much higher price than they would give for new oak timber. The masonry of the hotel consists of fine large cubes of stone; the stairs are of marble, and so are the tasteful chimney-pieces, which have all been sold at a high price. The same solidity and excellence are found in the doors, and all the other parts of the building, and everything has been sold at very high figures on account generally of the additional artistic value of the materials. The contractor who bought the building for the purpose of demolition will, in fact, have made the handsome sum of 1,100,000 francs, or about 44,000*l.*, out of the mere *débris* of the old hotel, notwithstanding the fact that the solidity with which it was built has necessitated a greater expenditure on the work of pulling down than had been originally calculated upon.

TENDERS IN GERMANY.

At the recent meeting of the Union of German Master Builders, resolutions were adopted approving the proposals which have of late been made relating to the institution of test examinations for those who desire to enter the building industry. The importance of the joint action of the various local guilds, and the necessity of uniformity in such tests as might be adopted, were fully brought forward in the course of the discussion which took place.

A good deal of attention was given to a proposal, which was finally adopted by the assembly, to the effect that in all tenders for public works the lowest tender should always be rejected, and the next higher be accepted, provided all special conditions were fulfilled. From the explanatory remarks quoted in the German press on the matter, it would seem that the uncertainty as to the result of tenders is found to be a considerable disadvantage to the German building industry, and that estimates sent in on the new system would not be of the speculative character which is encouraged by the principle of the acceptance of the lowest offer. The various tenders are, it is remarked, likely to come much nearer to each other. It is added that when the greater part of the contract is the execution of labour (apart from the furnishing of materials) it is by no means uncommon to find some estimates exceed others in the proportion of 3 to 1, in which case a certain amount of discredit attaches to the person whose tender is of an extreme character.

It is, of course, not urged that the choice should fall in all cases on the second lowest estimate, as there would be in some instances reasons of distance or unreliability to be urged against such a selection; but the absolute rejection of the lowest tender is insisted upon in the scheme thus propounded. The terms of the contract for which tenders are asked would in all cases state this point in an unmistakable manner.

It does not seem very clear in what way the master builders could settle this question, which would rather rest with their employers.

CENTRAL EUROPEAN CANALS.

A grand system of canals connecting all the great rivers of Central Europe has been projected by a number of Austrian engineers and others connected with the Donau-Verein or Danube Society. The various projects contained in this scheme have already been brought before the Austrian Parliament. One of these canals is to connect the rivers Danube and Oder, another the Danube and Rhine, and a third the Danube and Elbe. By means of this great project not only would the largest rivers of Austria and Germany be brought into connexion, but there would ultimately be uninterrupted water communication, available for the traffic in the heaviest classes of goods, between all the countries of Europe from the Black Sea to the German Ocean, and from the Adriatic to the Baltic. The engineering difficulties to be overcome are, however, very considerable. A *brochure*, just published by the Donau-Verein, which contemplates first the execution of the Danube and Elbe Canal, contains certain details of interest in reference to this project. In the rise from the Danube to the Moldau there will be required 130 locks, and in the descent down the Moldau fifty-five locks. The highest ground along which the canal would pass is 550 mètres, or about 1,700 ft. above the sea-level, at which the canal would run for about forty-eight miles. The depth of the canal is to be 6 ft. and the width at the bottom about 50 ft. The cost of the entire Danube and Elbe Canal, with locks, is estimated at 6,000,000*l.* sterling. The cost of cutting the canal is computed at 412,000 marks, or rather over 20,000*l.* per kilomètre, being equal to nearly 33,000*l.* per mile (English). Compared with the existing railways, the distance by the proposed canal from Vienna to Melnik (470 kilomètres) is certainly not calculated to recommend it.

TYPHOID AND DRAINAGE AT NANCY.

Though it is satisfactory to note that the unsanitary condition of Paris is at last awakening the attention of both the public and the authorities, there remains as much to be said with regard to the large provincial towns of France. For instance, the present typhoid epidemic in Paris is, after all, but a recent disaster as compared with the prevalence at Nancy of the same preventible disease. From 1870, typhoid fever has assumed an endemic character in that town, and this case offers special interest from the fact that the outbreak of the fever corresponds with the abolition of cesspools and the introduction of direct drainage from the houses into the sewers. Strange as this fact may seem, it will not surprise those who have some acquaintance with the ignorance prevailing in France on such matters. The town was allowed to drain into the sewers; but no measures were taken for emptying the sewers. At last, after three or four years' delay, and when many useful lives had been sacrificed and the inhabitants of Nancy had endured much illness and misery, the necessity of increasing the water-supply dawned upon the authorities. Now there is plenty of water, at least, in the streets, the supply amounting to 71 gallons per day per head of the population. Yet, in spite of this, the fever continued its ravages year after year, attacking sometimes the inhabitants of the old town, sometimes those of the new town, and showing, on the whole, considerable impartiality in its selections. Nor is there anything very exceptional in this fact, for, though water has been abundantly poured out into the streets, it has only been supplied to 750 houses out of about 8,000. Dr. Lallement, Professor of the Faculty of Medicine, in a protest recently issued, says:—

"We must have the courage to realise the truth. In each house, a horrible hole surrounded by dejections of all sorts allows the ascension of the most injurious gases, which, after sojourning some time in the disgusting and damp closet, generally reach a narrow back-yard with a humid permeable soil, and ventilation is rendered almost impossible by surrounding balconies and a canvas or tent-made roof."

The house drains are not, as a rule, protected by syphons, and where a syphon does exist, it is generally blocked up through the want of proper flushing. In some instances the house drains empty themselves in old and abandoned sewers, which receive no rain-water, and are never cleaned. Some houses still drain into permeable cesspools, which allow sewage matter to filter into neighbouring wells: in fact, the town is in as barbaric a condition as it is possible to imagine, and yet there are, comparatively speaking, good sewers in the streets and a fair water supply. It is, therefore, to ignorance and indifference that we are to attribute an epidemic which has lasted for more than ten years. We have already remarked on the fact that sewers are being introduced on an extensive scale among the winter resorts of the Riviera, frequented by so large a number of English visitors. We trust that the experience acquired at Nancy will serve as a warning to the authorities of these health stations, and that before building sewers they will first ascertain what are the means by which they can be successfully managed.

THE NEW RATHHAUS OF VIENNA.

The completion of the above splendid edifice was celebrated last week by a grand banquet in the great hall of the building itself. The new Rathhaus is situated in the Ring Strasse, opposite to the new Burg Theatre, and near the new Parliament Houses of Austria, forming with them one of the most remarkable groups of modern structures to be found in Europe. The Rathhaus was commenced just ten years ago, in 1872. It is certainly one of the most magnificent Gothic edifices on the Continent. It has one lofty principal tower, and four subordinate ones. There is one large square court surrounded by a colonnade, and eight other subordinate courts. The edifice contains no fewer than 500 rooms, including two large festival halls. The principal façade, in solid masonry, has a fine terrace with outlook on the Park and Ring Strasse. The cost of the entire building has been 12,000,000 florins. The great tower was at the end of last week finished by fixing on its summit a figure, 9 ft. high, holding a flagstaff of 16 ft., and a sword 6 ft. 6 in. in length. This figure of the standard-bearer, which has already been nicknamed the Guardian of the Capital, will, like the spire of the Cathedral of St. Stephen, be a prominent object in all views of Vienna in future, being visible at very great distances. The architect of the Rathhaus is the Chevalier von Schmidt, one of the most distinguished of Austrian architects, who is at the present time engaged on the work of restoring and repairing the Cathedral of St. Stephen The architect was entertained by the Vienna Municipality at the inaugural banquet in the Rathhaus, on Saturday, being his fifty-seventh birthday.

We gave a view of the building in vol. xxxv. (1877), p. 980; and a larger view (with two interior views), a year ago (vol. xli., p. 516).

RIDLEY HALL, CAMBRIDGE.

Following closely upon the opening of Selwyn College, Ridley Hall, near Cambridge, was opened on the 18th inst. The new Hall, which has been erected by the munificence of Mr. Henry Gamble, is built in the Tudor style from the designs of Mr. Charles Luck, architect, of Carlton-chambers, Regent-street, on a freehold site, consisting of two acres, at Newnham. It contains principal's lodge, library, dining-hall, vice-principal's room, and accommodation for twenty students. It, as well as Wycliffe Hall, Oxford, is intended to assist in the preparation of resident members of the University, who are candidates for holy orders, in the principles of the Reformed Protestant Church. The building has cost 21,000*l.*

A New Sunday School and Lecture Hall, connected with the Baptist Chapel at Leytonstone, was opened on Thursday, the 19th inst. The cost was about 2,000*l.*, and the works have been carried out by Mr. J. Marsland, builder, under the direction of Mr. John E. Sears, architect.

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THE POLLUTION OF RIVERS, THE SOIL, AND THE AIR.

The society recently formed on the Continent under the title of "The International Association for the Prevention of the Pollution of Rivers, the Soil, and the Air," is announced to hold a congress this week at Brunswick. Amongst the papers to be read at the sittings are the following:—(1) Modern Hygienic Legislation, by Professor Reclam, of Leipsic; (2) The Most Recent Experiences with the Flushing System of Sewerage, by Professor Müller, of Berlin; (3) On the Supply of Water to Towns by the Filtration System, by Dr. Gerson, of Hamburg; (4) The Use of Peat Dust in Privies, by Professor Schultze, of Brunswick; (5) The Manufacture of Poudrettes, Manures, and Ammoniacal Salts according to the Freiburg Process, by Professor Engel, of Carlsruhe; (6) The Chemical and Mechanical Purification of Sewage Water, by Dr. Petri, of Berlin; (7) A New Process for the Cheapest Purification of Foul Waters, by Dr. Gerson, of Hamburg; and (8) On Moisture in the Atmosphere and its Measurement, by Professor Reclam, of Leipsic. In addition to holding sittings on two consecutive days for the reading and discussion of the papers, the members of the Congress will visit the Brunswick Abattoirs, Technical High School, and other institutions.

ST. SAVIOUR'S CHURCH, STRIESEN, DRESDEN.

This little church, recently erected in Striesen, a suburb of Dresden, has a history of its own which appeals to our sympathies. It is, at the same time, a memento of the tolerance and hospitality of the rulers of Saxony, who gave a welcome, more than 200 years ago, to the Protestants driven from Bohemia. The emigrations of the Evangelical Bohemians began at the commencement of the Thirty Years' War, after the unfortunate battle of the White Mountain, near Prague (November 8th, 1620). In 1622, four German Lutheran pastors from Bohemia found an asylum in Dresden. During the next year, the flower of the Bohemian nobility came to Pirna, where several thousand refugees had found a temporary home. Most of them, who had been induced to return to their native country in 1639 with the Swedes, under General Stahlhans, but who were shamefully plundered and maltreated by their protectors on the road, now turned to fortified Dresden, where they were received by the then elector, Johann Georg I., with great kindness. They settled to the north of Dresden, and laid the foundation of the present Antonstadt, where the "Böhmische Gasse" still reminds us of their early struggles. Those men and women were the ancestors of the present community of "Exulants," as they are called, to whom Dresden is indebted for the flourishing state of its flower and vegetable culture. At the present day many of their descendants are well-known and much-sought-after florists. The Exulants worshipped at first in their native tongue in a private house. In 1650, however, St. John's Church, at the Pirna Gate, was given them. Their religious services were conducted in this building for 210 years, at first in the Bohemian, later in the German, tongue. That church being taken down in 1860, the church attached to the Dresden Orphan Asylum was handed over to them for use. Still, their desire was to have a "God's house" of their own, and this wish has now been fulfilled, the present Erlöserkirche reminding them of the St. Salvatorkirche which they once possessed at Prague.

The church, which we illustrate in this week's *Builder*, was built from designs by the architect, G. L. Möckel, of Dresden. It is in the Early Gothic style, and very solidly constructed.

International Electrical Exhibition at Vienna.—An International Exhibition of Electrical Apparatus will be held in Vienna in the months of August, September, and October next year. The building in which the exhibition is to take place is the Rotunda, which has been left standing from the Universal Exhibition of 1873. Announcements from intending exhibitors must be sent to the General Committee at Vienna not later than January 1, 1883. It has been resolved that no rent or fees of any kind shall be imposed on exhibitors.

CHAPEL ROYAL, BRIGHTON.

This building, which is, or rather was, a perfect square on plan, with deep galleries on three sides and a square lantern in the centre, was altered as to its internal arrangements and decoration some few years ago by Mr. Blomfield. At that time the south side of the chapel was hidden by certain houses in High-street, parts of which were actually built up against it. When, in widening and improving the street, the town authorities removed these houses, the side of the chapel, which was never built to be seen, was revealed in all its ragged deformity. Mr. Blomfield was then called upon to design a mask, or casing, of effective, but not too elaborate character, one of the conditions being that the form of the windows should be preserved, a condition which made the task more difficult than it otherwise would have been. The town, at the same time, gave up a piece of ground sufficient for the erection of a small belfry and clock-tower.

The work has been carried out in red brick and terra-cotta by Messrs. Geo. Lynn & Sons, of Brighton, and an effort is now being made to complete it by casing in a similar manner the old entrance-front, which is at present much out of harmony with the side.

We may add that this building was erected in 1793, to serve partly as a Royal Chapel and partly as a Chapel of Ease to the parish church of Brighton. The foundation-stone was laid by his Majesty King George IV., who himself attended Divine service in the church when it was completed, until a private chapel was built within the grounds of the royal residence. The church has no endowment, and is, moreover, encumbered with a debt. It has attached to it a large poor district of 4,000 souls, and the congregation attending it is wholly unequal to the financial strain involved in the work of restoration. A bazaar is accordingly being held during the present week in the Dome, Royal Pavilion, and it is hoped that by this means the funds required may be secured.

HARVEY GRAMMAR SCHOOL, FOLKESTONE.

This school was founded in 1674 by Sir Eliab Harvey, brother of the famous Dr. William Harvey, the discoverer of the circulation of the blood. Though the great Harvey spent the chief part of his life away from his native town, he did not altogether forget it, as at his death he left the sum of one hundred pounds towards the endowment of his brother's school. The founder himself, Sir Eliab Harvey, left to the school certain lands at Lympne, in the county of Kent, besides the school premises in the town of Folkestone.

Originally it was intended that the charity should provide (1) a free school; (2) a new boat periodically for the poor fishermen of the town; (3) a van-lade or copper for the use of the Folkestone fishing trade; (4) apprenticeship fees for deserving boys. Eventually the income of the charity was found to be insufficient to meet all the charges upon it, and the school having fallen into decay, or nearly so, an Act was passed in 1858 for "confirming a scheme of the Charity Commissioners for Sir Eliab Harvey's Charity in the town of Folkestone." This Act provided that the apprenticeship of boys and the purchase of fishing-boats out of the funds of the charity should cease; but the trustees were empowered to continue the van-lade at an expenditure not exceeding 5*l.* a year. As for the school itself, twenty boys were to be educated free, the course of instruction including English subjects, French and Latin, mathematics, drawing, science, &c., the master being at liberty to take private pupils to the number of thirty.

For nearly half a century the school has been carried on in small premises situate in the centre of the town. The old buildings included, besides the schoolroom, a small cottage for the master and two other cottages, one of which was used at one time as the Folkestone Dispensary, the other being let off to a private tenant. Later on, the dispensary was removed to other quarters, and two of the cottages were thrown into one for the use of the master.

As the population of Folkestone increased, the old premises became altogether inadequate to meet the wants of the town, and accordingly, in 1880, the trustees having obtained the consent of the Charity Commissioners, sold the old site. Being in the best business-quarter of the town, they realised sufficient to build new and larger schools. A site, about 150 yards distant, was purchased from the Earl of Radnor, and the trustees commissioned their architect, Mr. Robert Wheeler, of Tunbridge Wells, to prepare plans for a new building. These were subsequently approved by the Charity Commissioners, and a contract was entered into with Mr. H. Clemmans, contractor, Folkestone, for erecting the building. In consequence of the great fall in the site the plan required special treatment to suit the inequalities of the ground; as will be seen by the plan, the level of the school-floor ranges with the line of the chamber-floor of the house. The buildings are designed to accommodate 130 scholars, including about twenty boarders, and are faced with red and stock bricks. The external walls are built hollow. Corsham Down stone is used for all dressings. The roofs are covered with Broseley tiles, the dormitory story being hung with red weather tiling, relieved by white bands. Nearly all the joiner's work is executed in pitch-pine. Care has been taken with regard to ventilation and drainage. The cost of the whole of the works, including boundary fences and fittings, has been about 3,000*l.*

AN OLD KNOCKER.

RUINS OF THE PALACE OF MOSSEN SORELL, VALENCIA.

Not long ago, the Spanish press lamented the loss, by fire, of the above ancient building,—the property of the family of the Sorells,—an edifice reported to have been of exceptional architectural beauty, which adorned Valencia, and of which the city was deprived in the space of a few hours. The loss of the remarkable building having been very sensibly felt, in order to preserve the recollection of its beauties to the Spanish nation, the Spanish Academy of Arts has had a series of sketches, drawn by the director of the School of Fine Arts, executed, in which the several artistic features of the edifice have been carefully incorporated. Very few historical data are obtainable respecting the Sorell Palace; but the Marquis de Cruilles, in his "Guia Urbana de Valencia," mentions that Arnaldo Sorell, whose coat-of-arms contained two fishes, called, in the language of the troubadours, *Sorell* (tunny-fish), was knighted by Don Jaime I., in Mallorca, on account of his having hoisted the pendant on the walls of Palma during the conquest of the Balearic Islands, in 1230. During the combat at Puzol, Valencia, however, he was wounded, and died at Puig; but his son was very liberally rewarded for the bravery of the father by gifts of valuable land in Algemesi. Mossen Luis Sorell built, in the fifteenth century, the palace which engages our attention. It appears, however, the direct line of successors of the original possessors of this edifice having become extinct, the property descended to a collateral branch of the family, who did not place much value upon it, and permitted the building to go to ruin. The Spanish writer whom we have already quoted says:—"This edifice, being used for various other purposes than those of habitation by its owners, combined with the want of means to keep it in repair, soon fell into ruin. From the two points of view, its antiquity and architectural style, it is a painful picture to contemplate in its present deplorable condition, and it is still more pitiful to witness its roofs demolished, walls calcined, its rich ceilings reduced to ashes, and its doors carbonised." Out of these ruins, the knocker which we illustrate was saved, as a specimen of artistic work of the fifteenth century. Although every effort is said to have been made to save the principal portions of the building from the flames, it was only possible to preserve the rear part, which possesses little of architectural interest. The principal hall has disappeared, with the famous ceiling, for which 14,000 dollars were offered in 1852, and the frieze of which contained the following inscription:—"What edifice should I raise which could not pass away with Time?" The above sentiment harmonises with that expressed in Gothic characters on the stones of the portal of the edifice, and which runs thus:—"Our possessions vanish, but our good works do not perish."

West St. Giles's Church, Edinburgh.—The architects of this new church, recently mentioned by us, are Messrs. Hardy & Wight.

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ST. SAVIOUR'S CHURCH, STRIESEN, DRESDEN.—Herr G. L. Möckel, Dresd[illegible]ct.

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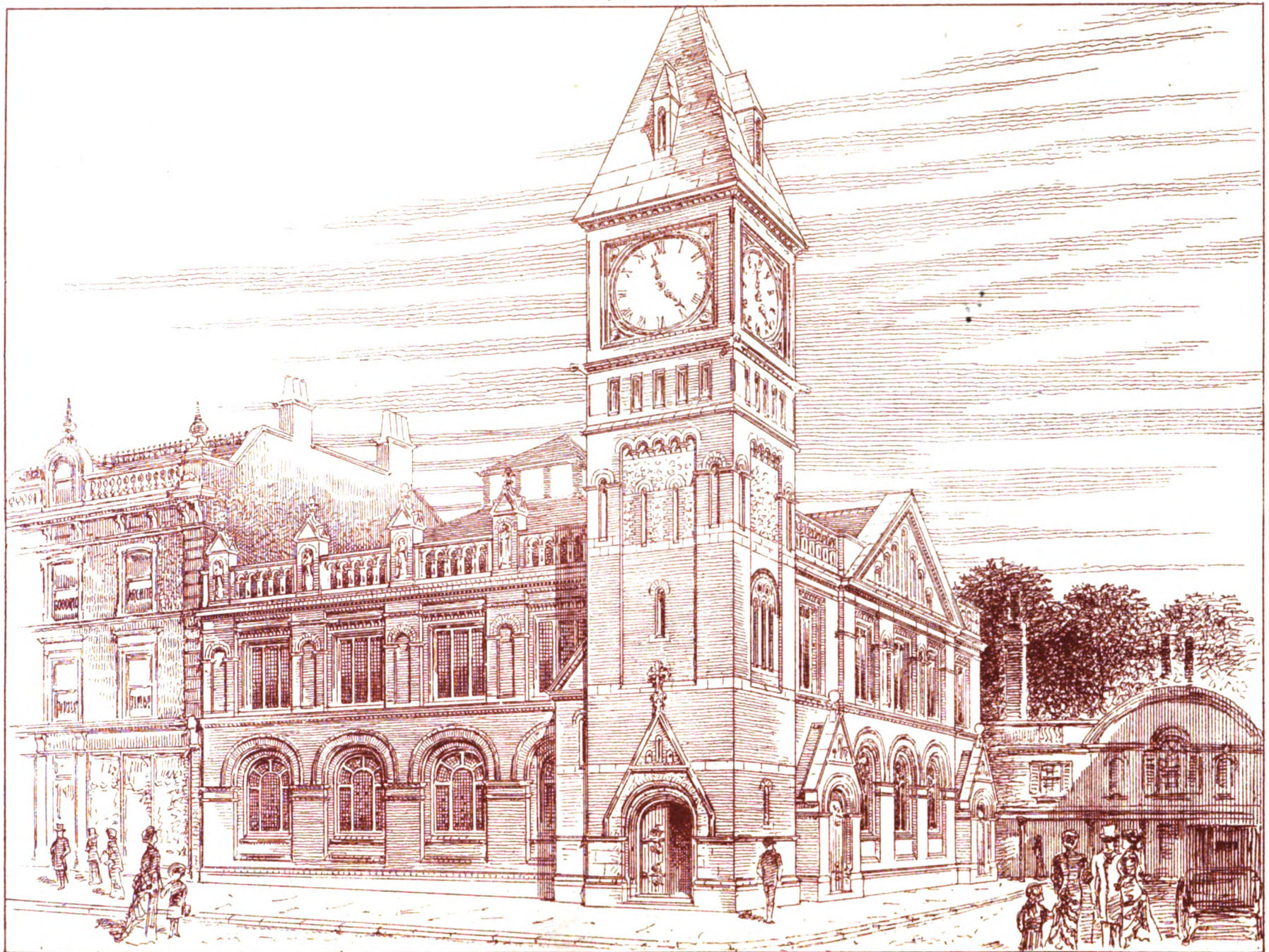

Whiteman & Bass, *Photo-Litho* 236 High Holborn.

CHAPEL ROYAL, BRIGHTON: AS ALTERED.—Mr. Blomfield, M.A., Architect.

Wyman & Sons, Printers, Gt Queen St.

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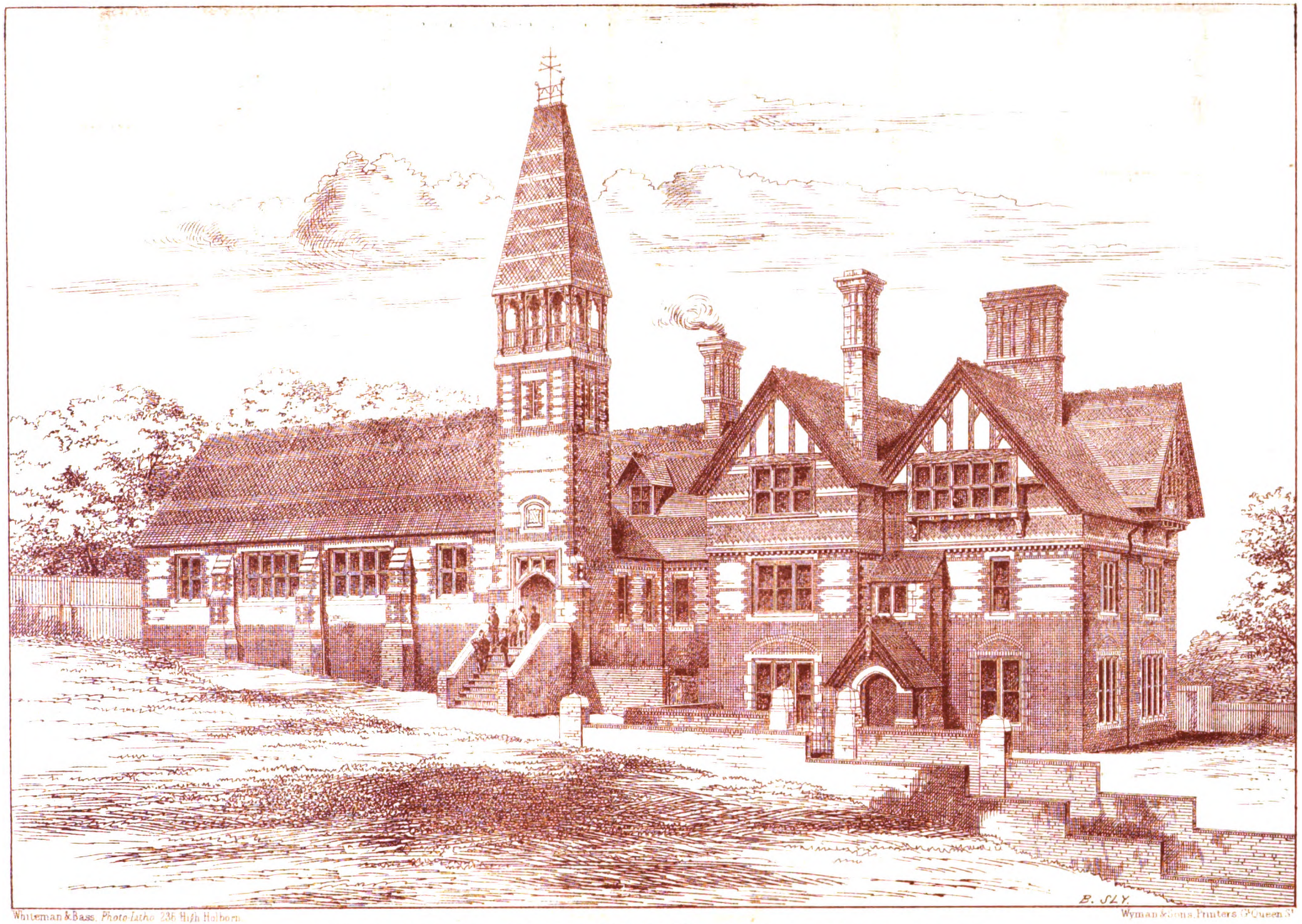

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HARVEY GRAMMAR SCHOOL, FOLKESTONE.—MR. ROBERT WHEELER, ARCHITECT

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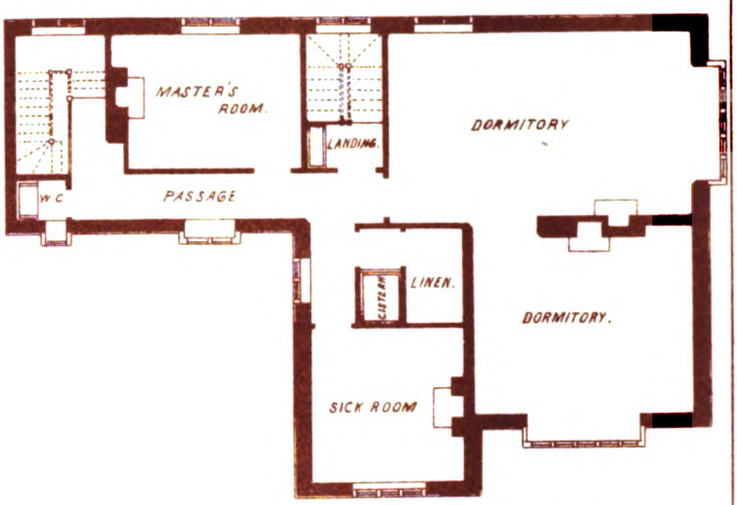
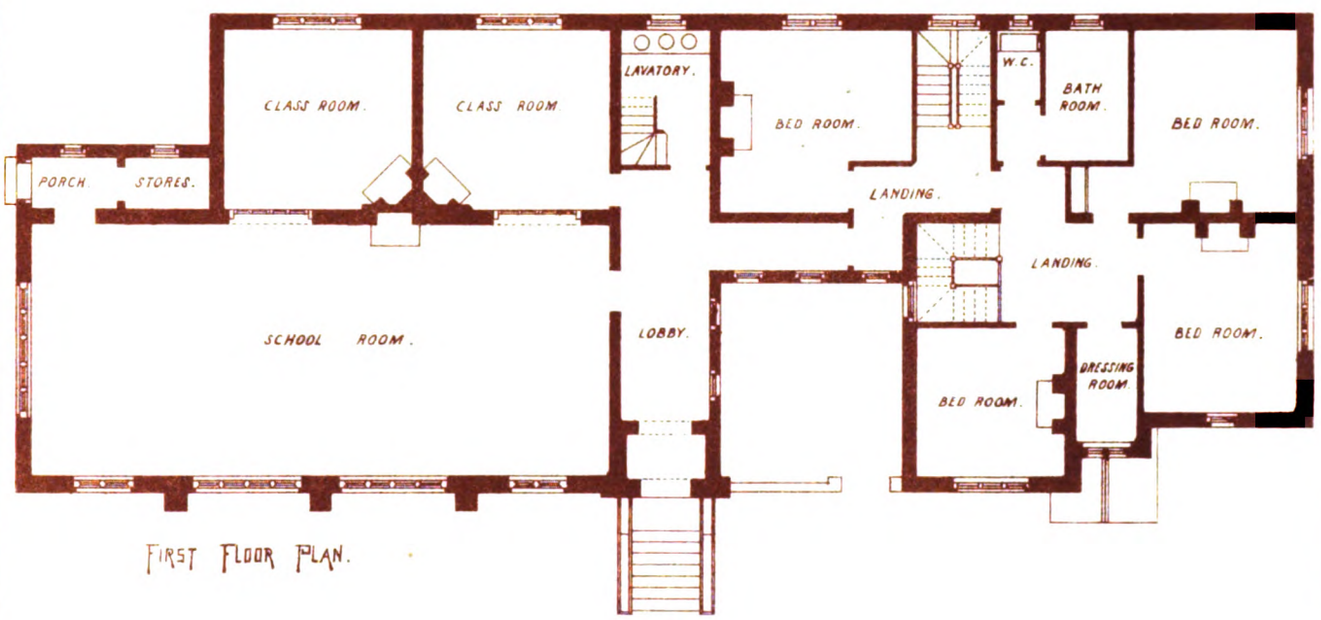
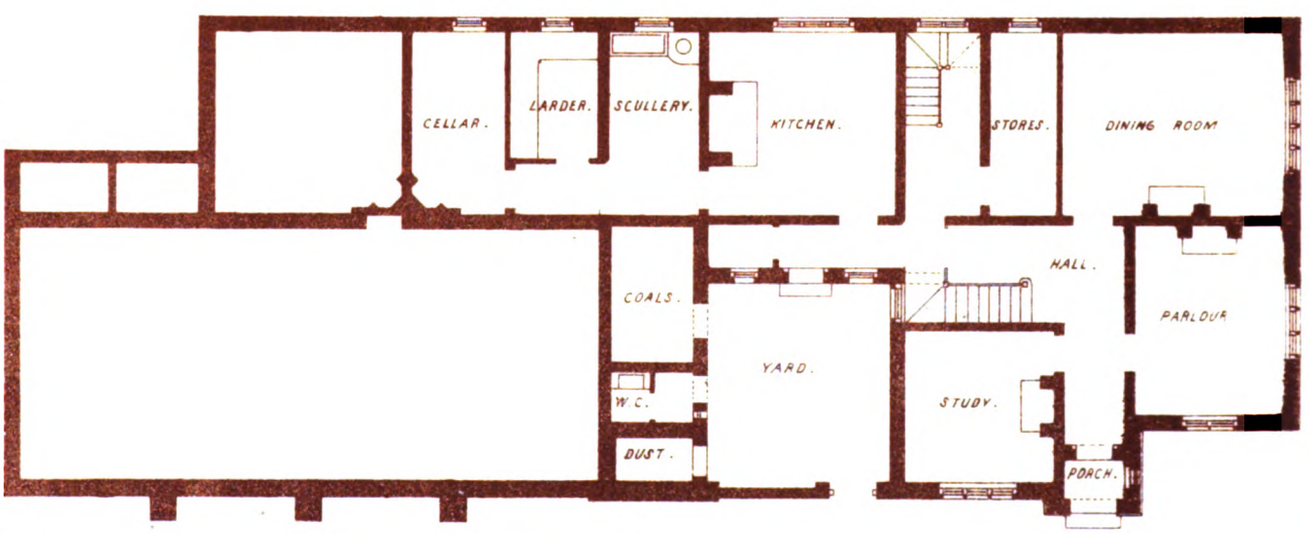
Harvey Grammar School. Folkestone.



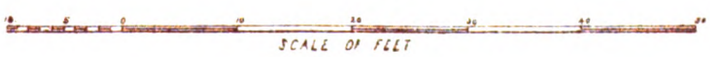
ATTIC PLAN.



FIRST FLOOR PLAN.



GROUND PLAN.



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SKETCHES IN ILLUSTRATION OF ARTICLE, "WHAT ARE WELL-SHAPED OBJECTS"?

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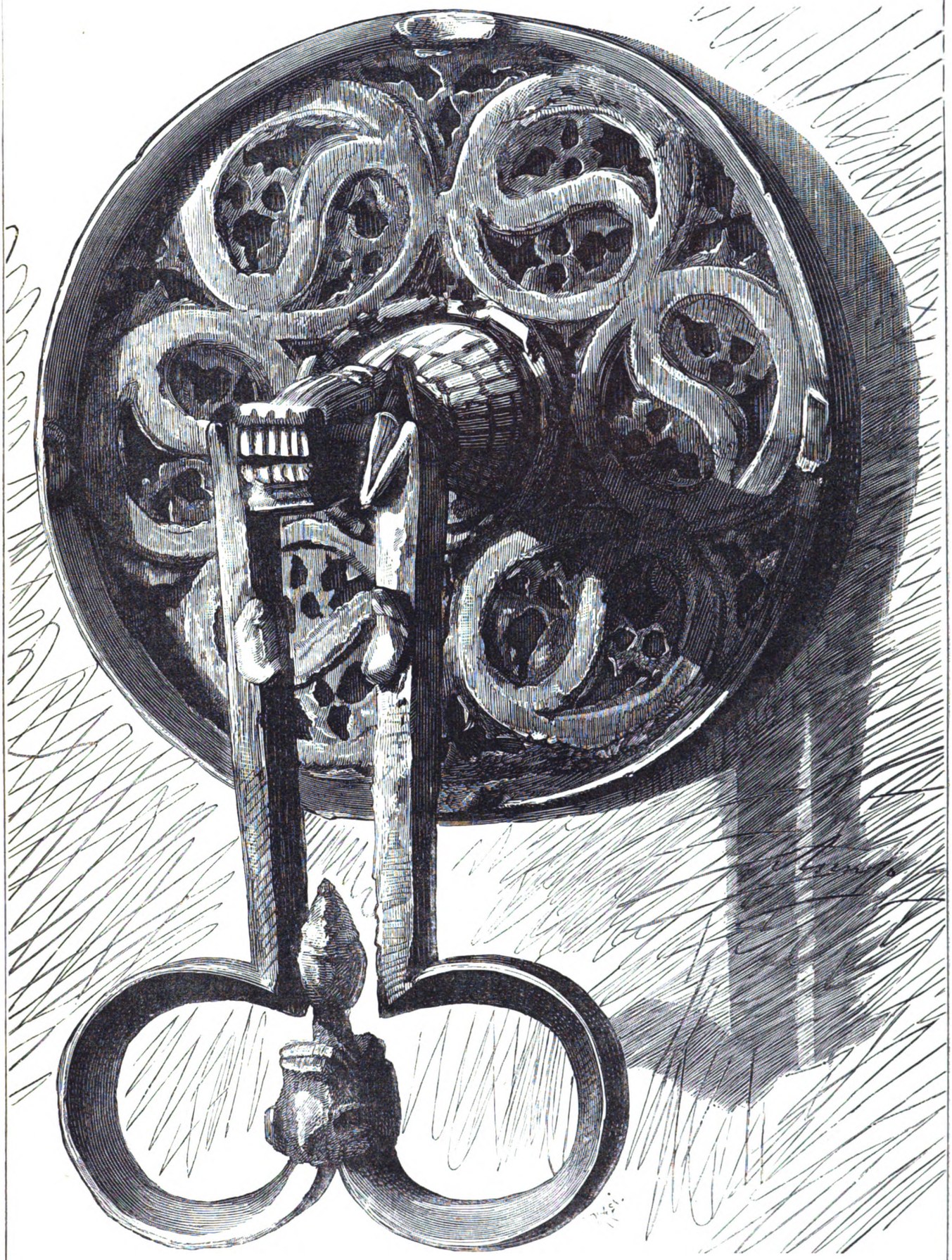

AN OLD KNOCKER: FROM THE RUINS OF THE PALACE OF MOSSEN SORELL, VALENCIA.

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WHAT ARE "WELL-SHAPED OBJECTS"?

In the course of a very good and sensible paper read at the recent Social Science Congress, in regard to the best means of bringing a love of art home to the people, it was mentioned, among other things, that one means of cultivating in the lower classes a taste for the artistic side of things was to familiarise them, in museums or through the medium of presents made to them for their own use, with "well-shaped objects." In the course of the discussion thereupon the question was asked by one speaker, what were "well-shaped objects," and whether the reformers of popular taste had made up their minds on that point. It is certainly "a question to be asked," and it occurred to us that, with the aid of a few sketches by way of illustration (the pencil speaks plainer in these matters than the pen), an attempt at answering such a question, or at least considering what its real point is, might be made, in a more systematic and logical way.

In the first place, let us say a word of warning in regard to the attempt which is now often made to give a direction to public taste by pointing out to people what objects they ought to admire. The endeavour to do this is not carried on only by those who address themselves to the lower classes. We have recently seen the opening of more than one artistic furniture depôt intended to meet the requirements and the purses of the upper twenty thousand, in which it was guaranteed that every article offered for sale would have passed the judgment and approval of a committee of artistic experts, and that purchasers might be assured that whatever they should buy from these galleries would be in good and true artistic taste. Happy purchasers! like the country-folk mentioned by the Latin poet:

> "O fortunati nimium sua si bona norint
> Agricolæ!"

too happy, if they only knew their own blessedness. To have good taste provided and purveyed for them, for so much cash down; to be assured beyond all doubt on the point, without so much as the trouble of thinking or cultivating their minds in any way! But we fear this is somewhat of an illusion when we come to look below the surface of it. In the first place, there is very little good done to people by merely laying out before them an assortment of things and saying, "These are in good taste,—these are artistic." Perceptions of the artistic are not much cultivated by this kind of paternal government in art. Of the demon of bad taste it may be said, as it was said of other demons of a worse nature,—"This kind goeth not out but by prayer and fasting," or, at all events, by thought and mental wrestling. We cannot exercise the demon till we come to grapple with him, to know what he is, what he means, why he is bad, and why his opposite is good. Artistic taste grows by observation partly, but by observation combined with thought; and the tendency of people who are too much governed in matters of this kind is to save themselves the trouble of thinking, and to accept what is set before them, asking no question for conscience sake. This would be bad, even if the judgment of the selectors and approvers were infallible. But the practical result is that in such cases a good deal of what is set before purchasers as artistic is in reality only selected according to the influence of a fashion of the day. Japanese things are in fashion; Queen Anne furniture is in fashion; and specimens of either class of work are offered and accepted as necessarily representing artistic style, without a thought of question or criticism on either side: whereas the fact is that some of the things thus selected may be, on abstract principles of art, in very bad taste; and that specimens of good and bad, refined and clumsy work, are often offered and accepted side by side, merely because they belong to the class of work nominally reckoned as artistic for the time.

Having in view the epithet "well-shaped," which suggested these remarks, we confine our considerations on this present occasion to the class of articles in which shape, and shape alone, goes for most: articles in which a high order of artistic expression is not attempted, but in regard to which the question is whether the shape and outline are at once agreeable to the eye and suitable for their purpose. Now, this last-named condition gives us in reality the key to a good deal of just reasoning upon the matter of taste in shape and general design. For unless an object is purely apart from suggestion of practical use, a great part of its tastefulness or non-tastefulness depends upon its suitability for its intended use, and upon the suitability of each part for its intended purpose. Here, therefore, we meet with something like a clue to guide us through the maze. We are not left entirely to make random shots as to what is artistic and tasteful and what is not. We have the consideration of the relation of the form to practical use, and of the relation of the several parts to their functions, to guide us; and also the relation of the design to the construction, and the question whether it is a true expression of the construction or not; and if we put one thought to these questions, and consider them apart from the dictates of fashion, we shall find, perhaps, that some things which it is the fashion to admire will by no means pass the test of abstract criticism.

Let us confine ourselves for the moment to the class of articles which may be included under the general term "utensils," as it is as well to have a limit in considering such a multifarious subject as shape. Can we define what are the requisites of such objects in regard to general design? Perhaps they may be expressed thus. In whatever material an object is constructed, it must be designed in a manner suitable to the practical nature of the material. Bronze must not look like clay, in regard to shape, nor iron like wood. If the object is one to be used by or held in the hand, the part to be grasped must be suitable in shape, comfortable to the hand, and so placed as to take the weight it has to carry in the best balanced manner. If it is to stand on the table, it must have a firm base; nothing rickety is ever good. It must look strong; it should rather look stronger than it really is than weaker, and to this end the principal lines and angles should generally be more or less emphasised, and such points as the junction of the handles or the feet with the body should be so designed as to appear stronger than the rest, and to look as if settled by design and not by accident. All these conditions being complied with, there remains the one quality which it is hardly possible to define, that of grace or beauty of general form; concerning which all that one can very well say in theory is, that there can hardly be the effect of grace to the eye or judgment unless there is a certain continuity of line and mutual balance of parts. One part must not be too heavy for another, nor must one portion appear of a markedly different character from the rest. There should be a unity of character and of intention running through all the lines of the object, as if it were the outcome of one spontaneous idea on the part of the designer; not as if put together piecemeal and arbitrarily.

Now we may, as has been already observed, arrive at a somewhat more definite idea in regard to the application of such maxims than we could attain by mere writing, by considering them in reference to a few actual examples of objects of the kind we have been referring to. We have collected on page 563 a few outlines of vases and other such like utensils, which will, at all events, serve the present purpose of illustration. Those figured 1 to 9 are examples of a class of work greatly prized at present, viz., *old* Japanese bronze work. The workmanship in all cases is beautiful; and every one of them has a character or *cachet* of the age and country which produced it, which renders each historically interesting. But let us see how they illustrate the best principles of taste in detail, what are the claims of each to rank as "well-shaped." No. 1, then, is almost as badly designed as anything could be. Its general outline is deficient in marked form and character, and in the upper portion a piece circular in plan is fixed awkwardly on to the octagonal body below, for no apparent reason but pure oddity. If the octagon were artistically modelled off into a circle, it would be a different thing; but the two parts are just stuck one upon the other as if they belonged to two different things accidentally put together. The base is sufficiently spreading to be firm, but the feet are very badly designed, for, instead of appearing the strongest, they appear the weakest part of the whole, being only so many thin ears of metal with little substance in them. It is clear, then, that the priests of the artistic gospel will not be safe in recommending anything because it is "old Japanese bronze," though we shrewdly suspect that many people would be quite ready to act upon that principle. No. 2 is much better designed in one sense, there is a graceful flow of line and a homogeneous character about it; but it is an example of the often curiously unpractical and illogical character of Japanese design in things of this kind that the vase actually has no base; it is rickety to the last degree, and, as we see in fig. 3, it actually looks much better and more purposelike when placed upside down; indeed, so far as outline is concerned, there might be a doubt whether it were not intended to stand this way. Now nothing, certainly, can be said to be well-shaped of which we are in doubt which way up it is meant to stand. What this vase wants is a spreading of the base in some such way as shown in fig. 4, and then it looks satisfactory and purposelike. The original form in fig. 2 looks very much as if the bottom had been knocked off it. Fig. 5 is a bronze jar of very peculiar and marked character. The large spreading rim was probably intended for some practical object. Now, though this vase, like Lady Jane, is "massive" rather than elegant, it is perfectly in keeping in its general form and proportion, and might be pronounced a very successful and tasteful object but for the handle. Here, again, Japanese illogicality of design is illustrated. The handle ought to be convenient to the hand; it ought to look as if meant to be grasped, and it ought, especially in the case of such a weighty-looking object as this, to appear especially strong at its junction with the body. But the Japanese artist has placed on the handle of his jar the only ornament in relief which is introduced,*—ornament unlike anything else on the jar, and which, besides being rough and uncomfortable to the hand, looks as if the handle had come from some other place and been stuck on to something it was not made for. The worst point of all is, that it looks merely stuck on; the ends of it just butt against the body of the vase, and instead of looking, as they should, strongest at that point, they look as if a blow would knock them off. At B, on the other side, is shown how the handle might be designed, so as to look like an integral part of the vase, and to look as if meant for the hand.

No. 6 is a very characteristic object, in which the artist seems to have aimed at carrying the same form throughout; he has the same leaf-like termination at the top, at the bottom, and on the belt which runs round the middle. This leaf-like form, though, however well suited to the top of the vase, is a weak one for the belt, which ought to have the appearance of binding the whole together, and still weaker for the foot, which ought to differ from the rim, inasmuch as its functions are so different. The vase has the further demerit of wanting spread and firmness at the base, and appearing, in fact, very rickety. A better thing might have been made out of it, retaining the character of the upper portion, by rendering the base more solid and spreading it more, as in fig. 7. Fig. 8, on the other hand, is a well-designed article throughout. It is heavy, but it is intended to have that character; the whole thing is simple and solid, the curves of the sides finely modelled, the handles very well introduced: the best point of all in it is the way in which the base is marked by cutting out the centre portion in an ornamental form, leaving the vase to rest on the portions at the angles; thus giving it greater stability, both real and apparent, and differentiating the foot from the rim, which otherwise would be too similar to one another. Fig 9 is still more praiseworthy, because, while equally consistent in design, it is more elegant in shape. Here the curves are fine and bold, the base spreading and firm; and it should be noticed how the handles follow the curve of the sides, with a feeling for purity of line more common in Greek than in Japanese work. Yet, exceedingly diverse as are the merits and faults of this group of Japanese bronzes, all sketched from the South Kensington Museum,—though some of them are very good, and some unquestionably very bad in design, yet we have no doubt that many purveyors of artistic objects for the improvement of public taste would offer these all in a lump as representing good taste, because they are all "old Japanese," and that nineteen purchasers out of twenty would accept them as such.

Fig. 10 is still Japanese, and is an example

* The body of the jar is covered with a diaper ornament in lacquer (not in relief), and of totally different character from that on the handles. Our remarks having to do with form only, we have not indicated the surface ornament in the examples, except where it affects the question of form in some way.

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of a style very popular at present, and certainly very piquant. But if we consider what is the meaning of this piquant quality which many people admire in work of this kind, we shall find that it really means that it is in opposition to what may almost be called natural canons of artistic design, and that probably the admiration for it arises merely from the fact that it is in opposition to the classic habitudes of design, and is therefore interesting as a change. People get tired of a correct art like the Greek, as people got tired of hearing Aristides called "the just," and they take to something that is all wrong for a change. It is a natural vagary of taste; but while admitting that it is pardonable to like ugly things for a change, do not let us try to make out that they are beautiful. As a matter of design, fig. 10 is really quite stupid in shape. The handles have no connexion with the rim, they are again merely stuck on; and the feet stick out from the spherical under-side of the bowl, as if they were wooden pegs put in as an afterthought; and the want of all spread at the base gives a bad support, and conveys the idea that the proper termination of the feet has been sawn off. In the actual example the feet appear to close in towards the base (though probably they are really straight), owing to the spread of the body of the vase above them: a disagreeable illusion which a Greek artist would have guarded against. A better design would be made by spreading the connexion of the feet over part of the under-surface of the vase, as in fig. 11, so as to take away that peg-like appearance we have complained of, and then by turning the extremities of the feet outwards, so as to give a more secure base. The handles also should be, as it were, tied into the rim moulding, so as to have a hold upon the body, instead of being merely stuck on the top of the rim. All these points are illustrative of the want of perception of the relation between design and construction which characterises so much Japanese work, in spite of its beauties of colour and sometimes agreeable piquancy of form.

A very simple example of an object which is thoroughly well-shaped is the fork shown in fig. 12. This is satisfactory simply because every part is shaped in accordance with its purpose and meaning. The handle is the right shape for the hand, the shank of the fork is designed so as to be strongest where strength is most required; the metal rim, which seems to bind the fork to the handle, gives emphatic lines just where they are required to suggest strength. This is an example of success arising from the entire absence of any self-conscious attempt to be ornamental. The reverse is shown in the spoon, fig. 13. Here the end of the handle has been cut up into a series of points with the idea of making it "ornamental," with no consideration of the practical use of the article; the result is only an absurdity, as every one feels at once that the handle must be uncomfortable for use. Fig. 14 is an extreme example of absurdity; the adoption of a coral branch for the handle of a spoon. Coral is a very pretty thing in its right place, but it is ridiculous as thus used, and makes the spoon a mere eccentric curiosity instead of an article for use. Fig. 15, the outline of a Persian brass kettle, affords a curious instance of a mistake arising from what leads to so many mistakes in design, the wish to be "original," in the sense of doing something that no one has done before. This has led the maker to turn up the rim which forms the base of his kettle, on each side, like a looped-up straw hat. He fancied he had done something pretty and piquant when he had done this. He has merely succeeded in making the kettle look absurdly insecure, and as if it must roll over with the least touch.

Figs. 16 and 17 present an instructive contrast. The first may be considered to be in the main a very well designed object, chiefly because of the harmonious progression of all the lines, the handle, it will be observed, growing tangentially from the curve of the bowl, instead of merely butting against it as in so many of the Japanese examples; and the base is sufficiently broad and heavy to look secure without interfering with the general character of lightness and elegance in the whole design. In fig. 17 the base is far too light for the scale and spread of the upper portion, which at once gives an unsatisfactory effect, and the upper and lower portion of the bowl are most inharmonious in line, and seem to have no relation to one another; the upper part looking almost as if it were a separate straight-sided cup fitted into the lower one. Another kind of discrepancy is shown in figs. 20 and 21. The first is the actual form of the object; and it will be seen that while it has a strong projecting moulding in the centre of its height, dividing the upper from the lower part of the cup, the base mould is only a simple flat rim ornamented with a leaf pattern. This is disproportionate. The conditions should have been reversed, as in fig. 21; a strong and plain moulding at the base, and the thinner and ornamented moulding as the subsidiary one, the "string-course," we may call it, above.*

Fig. 19 is an instructive example of the manner in which an object, admirably designed and very picturesque in the main, may be to some extent spoiled by want of attention to constructive expression. The main outline of this, which is a tea-urn, is most elegant, and a form specially suitable for metal. But in joining the handle, feet, and spout into it, the artist has shown a want of perception of the proper way to do this, and has weakened the whole appearance of the thing in consequence. The handle has been merely jammed into one of the angles on the surface of the urn. It ought to have been connected with and tied into the mouldings on the rim and the body, as shown in fig. 18. The spout is merely stuck into the middle of the ornamental chasing on the lower part of the urn, as if by accident, instead of having a proper insertion designed for it. The foot in the original design is the worst of all. It is a weak piece of curly-whirly work, with no proper foot, no connexion with the body of the urn, and no look of strength in itself. It should have been connected with the constructive lines of the base, as, for instance, in fig. 18, and it should have had the appearance of a foot or support,—a shank with an extended surface to form a base or foot, instead of looking like a mere ornamental curl that might occur anywhere in a design, and has no constructive expression at all.

We have purposely selected a good many of these examples from works of a class and date much thought of at present. We hope we have at least succeeded in indicating how poor a guide to taste is the mere assumption that this or that school of work is good and is to be accepted as artistic work, and in showing that the decision as to good or bad, "well-shaped" or "ill-shaped," in the design even of the commonest articles of use, is to be made on grounds of abstract criticism, and in reference to the manner in which the use and the construction of the object are expressed in its design, and not in reference to a mere aimless preference, "I like this," or "I don't like that"; still less in obedience to any dictates of a purveyor of "artistic" objects.

* No. 22 was inserted as an afterthought, and represents the outline of a perfectly plain glass tumbler in which, since these remarks were written, a mixture of water with another liquid was presented to us at a club of somewhat æsthetic tendencies. Now, here is an article which, without the slightest pretence of being "ornamental," is really well shaped, because its shape is exactly suited to its purpose. The lip is spread to be convenient for drinking from; the base is spread, not so much, but sufficiently to give stability, while the narrower proportion of the middle part admits of being easily grasped, and prevents any chance of the glass slipping through the fingers, as a straight-sided tumbler may do. Such an object is shaped in an artistic spirit,—a spirit which may be shown in the plainest as well as in the most elaborate design.

THE FEMALE SCHOOL OF ART.

The prize drawings by the students of the Female School of Art, which were on exhibition in Queen-square, Bloomsbury, last week, were in many cases distinguished for grace of design and delicacy of execution, and showed distinct signs of that careful and systematic training by which alone serious results can be attained. In the Female School of Art, drawing in outline and from the round, with a proper study of light and shade, is insisted upon before the students are entrusted with colours. Miss Gann, the Lady Superintendent, and her staff may be congratulated, as well as Miss Ethel Chapman Nisbet, on winning the national gold medal, for a group of chrysanthemums, in water-colours. Miss Nisbet also takes the Princess of Wales's scholarship. Miss Lydia Bacon King is successful in carrying off the Clothworkers' Company's scholarship of 20*l.* and the Queen's gold medal, for a chalk head of a *contadina*, drawn from the life. The Queen's Scholar (for the second year) is Miss Constance Wood, and the Gilchrist Scholars (first and second years respectively) are Miss Lilian Abraham and Miss Ottilie A. R. Bodē. The Baroness Burdett-Coutts's scholarship of 40*l.* has been won by Miss D. Crittenden (second year); a second scholarship of 20*l.* was granted to Miss Lilian Young; and her ladyship's prizes for designs for cameo locket are taken by Misses Edith Ellison, Emmeline Deane, and Maud Earl. Several scholarships have been presented to the school. Mrs. William Atkinson has presented 25*l.* a year, for ten years, in memory of her late husband; and a member of the committee, Mr. George Brightwen, of Stanmore, has also presented a scholarship of 10*l.* per annum, for ten years. It is satisfactory to note that Miss Florence Reason and Miss Mary Harding have been admitted from the Female School of Art in Queen-square as students of the Royal Academy schools. The Baroness Burdett-Coutts has offered the following prizes to the students for the coming year:—Prize of 5*l.*, for the best design for a cameo for a bracelet; prize of 5*l.*, for the best design for a painted fan; prize of 3*l.*, for the best designs for Buckinghamshire lace.

THE TEACHING OF DRAWING.

Professor Roscoe, speaking at Stoke-on-Trent, on the 20th inst., on the subject of technical education, made the following observations:—

It is often said that the French have a natural taste for art, and that it is hopeless for England to compete with her in this department of industry. This I do not believe. England has produced artists of every grade and kind equal to any which France can boast, and therefore the capability of the Englishman to receive and to excel in art-work is, I believe, certain. But he needs training, and that he has not yet had, either in pure or applied art, to anything approaching the extent to which it is supplied to the French student. Our system, or want of system, of teaching drawing in primary schools is execrably bad; the French system is excellently good. In the one case the boys learn nothing except to detest the whole business; in the other, children soon find that they benefit from the teaching. They then take an intelligent interest in the subject, and this expands into a decided taste, which grows with their growth and strengthens with their strength. In my opinion no subject whatever can be taught to young children which can exceed, if even it can compare, in importance with drawing. But then, of course, it must be properly taught. If properly taught, it not only trains the hand and eye, but may be made the most excellent means of exercising the child's observing faculties, of teaching it accuracy and patience, and of rewarding it when the difficulties are successfully surmounted in a tangible definite form by the drawing which it takes home. Moreover, this teaching of drawing is the proper commencement of technical instruction for every trade and for every class of industry, and for every position in those trades and industries. From highest to lowest the power of representing correctly on paper what has to be worked out in reality is a power which cannot be too highly prized, and yet it is one which, even amongst what is termed our educated classes, is rare enough. Now I maintain that our old-fashioned system of drawing from the flat leads to none of the above advantages; on the other hand, the time of the children is wasted, and not only so, but either their interest is never awakened or, what is worse, they are disgusted with the subject. The working of the Continental system has exactly the opposite effect. In place of drawing pictures of old tubs and besoms, broken-down cottages, or equally valueless objects, the French boy begins almost at once to draw from the round,—a simple cast of a leaf, for example. He then has some tool or simple piece of machinery placed on his desk. This he has first to sketch, then he accurately measures all the parts, and, noting these, he afterwards has to construct a sectional drawing to scale of the object. Problems of constantly increasing complexity are thus placed before him, and the objects which he has to draw are such as are of everyday use and of practical value, and the result is that the little French or German boy out of the street is able to draw, and draw accurately, in a way which is absolutely astounding to an Englishman conversant only with the work of the ordinary primary English school. I am perfectly well aware that we

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have in England schools where drawing is well taught, as well, perhaps, as anywhere else. But the exception only proves the rule.

SCOTLAND IN PAGAN TIMES: THE BRONZE AND STONE AGES.

THE RHIND LECTURES IN ARCHÆOLOGY.

Dr. Joseph Anderson commenced, on the 16th inst., in Edinburgh, his third course of Rhind Lectures, in connexion with the Society of Antiquaries of Scotland. In his first lecture he dealt with the sepulchral remains of the Bronze Age as found in cists and cemeteries.

The second lecture of the course was delivered on the 18th inst. The lecturer said that having obtained from the description in the previous lecture a general knowledge of the characteristics of the burials of the Bronze Age, as they were manifested in Scotland, they had now to proceed to the examination of a series of burials distinguished from those previously described by their association with those peculiar erections known in this country by the designation of stone circles, or circles of standing stones. He gave a detailed account of the group of burials discovered in 1860 by the late Dr. Bryce at Mauchrie Moor, Arran, and which were found to contain urns and implements or ornaments of bronze and flint among the fragments of human bones. In these burials the phenomena were of the same special character as those described in the previous lecture. They were associated with implements of bronze or urns decorated with that ornamentation of straight zig-zag lines which was characteristic of the age of bronze; but they differed from those already described, in respect that they were marked by the presence of a ring of standing stones encompassing the area in which the interments had been made. He went on to describe a series of interments in which this peculiar characteristic was especially conspicuous,—the group of burials found at Tuack, near Kintore, with its area enclosed by a circle of upright pillar-stones; the grave-ground at Crichie, where the circular space was cut off from the surrounding area by a trench passing round it, but leaving accesses on the north and south sides, and in which, among the other relics, was found a finely-made head of a stone hammer or battle-axe; the circular cemetery, surrounded by standing stones, at Rayne, Aberdeenshire; and those at Sunhoney, Ardoyne, Ardlair, Castle Fraser, and other similar groups. These were all burials chiefly after cremation, but occasionally of unburnt bodies, and the burnt and unburnt burials occurred in the same group, and with similar associations. The objects associated with the burials in the character of grave goods were small pins of bronze, portions of thin bronze blades, chips of flint, bracers of polished stone, and the head of a perforated stone hammer or battle-axe. From the frequency with which these burial circles were found to contain a plurality of interments, it was obvious that they were not the monuments of single individuals, but family or tribal burying-grounds. From the fact that they contained interments burnt and unburnt, it was obvious that they were in use when both these customs were practised, while the occurrence of bronze in association with the burnt interments assigned them to the age of bronze. In all these instances the circular stone-setting, whatever might be the precise form which it assumed, had been found to be the external sign by which the burial-ground was distinguished from the surrounding area. Like the cairn, it was the visible mark of the spot of earth to which the remains of the dead had been consigned, though of course it was impossible to say, and it was not necessary that it should be affirmed, that in every stone circle the evidences of interment would be found. The colossal size of their pillar stones, the magnitude of the area enclosed, the care and labour expended in trenching and fencing it, were features which gave to these singular constructions a peculiarly impressive character. This impressiveness was specially characteristic of such a circle as that of Stennis, in Orkney, which encloses an area of two and a half acres, and the chief features of which he described. He also noticed the standing stones of Callernish, in Lewis, a type of structure which was associated with a chambered cairn. He called attention to the occurrence of this small chambered cairn in association with a great stone circle, because the cairn appeared in a subordinate character,—because it was plainly the great stone-setting and not the small cairn which was the principal object. The cairn had given way to the circle, and the circle had risen to the dignity of the principal member of the composite structure. It thus became clear that the circular stone-setting, which first appeared as an adjunct to the stone-age cairns, acquired its dignity and importance through the degradation of the cairn structure which it encircled, and came at last to stand alone as the characteristic mark of bronze age burial.

Dr. Anderson's third lecture was given on the 20th inst., its subject being "The Culture and Civilisation of the Bronze Age in Scotland." As there was no example of a dwelling or a stronghold which could certainly be assigned to the bronze age in Scotland, the remaining materials from which conclusions might be drawn with regard to its culture and civilisation consisted chiefly of the arms, implements, and ornaments of the people which had been preserved in the soil, though not associated with burials. The circumstances in which they occurred were (1) in hoards or deposits of greater or less numbers of articles, often of different varieties of form and character; and (2) in single examples found casually in the soil. He described the principal deposits which had been found in Scotland, and, noticing the typical forms of each of the several varieties of objects which he had described in detail, he observed that the weapons differed widely in their form from those with which they were familiar as products of the iron age. They were, however, of the same class, though differing in form and material. With these groups of weapons and implements there were associated certain peculiar forms of personal ornaments, chiefly in bronze and gold. The lecturer gave examples to show the prevalence of the use of gold in Scotland, at a period when iron and silver did not appear among the industrial products of the people, and bronze was the only metal employed in the fabrication of their cutting tools and weapons. Summing up, in conclusion, the characteristics of this peculiar phase of culture and civilisation, as they found it manifesting itself in Scotland, the lecturer said its essential characteristic was that bronze was the only metal employed in the useful arts. Whether they were weapons or tools they had this characteristic in common, that they were always well made, substantial, and purpose-like. In addition to these serviceable qualities, they possessed the high merit of being well designed, graceful in outline, and finely proportioned, exhibiting even in the commonest articles a play of fancy in the subtle variations of their distinctive forms that was specially remarkable. As the metal of which they were composed was an alloy,—a compound of copper and tin in certain proportions, variable according to the purpose of the instrument,—it was evident that knowledge and skill were requisite for the successful working of the material. As the forms of the manufactured articles were given to them in the moulds in which they were cast, it was evident that the brain which designed and the hand which modelled these forms must have been specially conversant with the technicalities of delicate processes, and with the experience of dexterous and skilful workmanship implied in such manufactures. Although we knew nothing whatever of their household arrangements, or the manners and customs of their domestic life, seeing that not a trace of a dwelling or site of a settlement of the bronze age had yet been discovered in Scotland, yet we were not without evidence of an indirect nature to indicate that they could not have been wholly destitute of the comforts and conveniences of life.

The fourth lecture of the series was delivered on Monday last, Dr. Anderson taking for his subject "Stone Age Burials — The Horned Cairns." In the outset, the lecturer said that in 1865 and 1866 he excavated a series of sepulchral cairns in Caithness of singular interest and importance in a scientific point of view, inasmuch as they disclosed features in connexion with the construction of cairns that were previously unknown. On the crest of a considerable eminence overlooking the south end of the Loch of Yarhouse, on the estate of Thrumster, in Caithness, are two cairns of great magnitude within a short distance of each other. They are not circular, but elongated in form; they lie across the crest of the hill from east to west; they diminish in breadth and height from east to west, and they have at both ends curved, horn-like projections of their structure, falling gradually to the level of the ground, and quite grown over with turf and heather, although the body of the cairn is bare. The larger of those cairns, after it was excavated, was 240 ft. in length. The breadth of the base of the cairn at the spring of the horns at the eastern end was 66 ft., and at the western end 36 ft. The horns expanded in their curvature so as to make the line across their tips at the eastern end 92 ft., and at the western end 53 ft. The extreme height of the cairn at the east end did not exceed 12 ft., sloping gradually to less than 5 ft. at the west end. The removal of the loose stones from the upper part of the east or higher end of the cairn discloses the existence of a chamber, with a passage leading into it, the nature of which Dr. Anderson described in some detail, adding that the chamber to which the passage gave access was excessively small as compared with the gigantic size of the body of the cairn. It was evident from the examination which he had made of it that this great cairn was a cairn only in external appearance, and for the same reason that a broch was a cairn,—that was, because it was a ruin. Originally this great cairn, which, by the dilapidation of ages, had assumed the appearance of an oblong mass of loose stones, had been built upon a definite ground plan, with a double wall defining its external outlines. It was a construction with an external elevation in the architectural sense, of which they had portions remaining of the height of 4 ft. It was also a structure in the architectural sense of having an internal elevation,—an interior chamber covered by a roof partitioned into compartments, and provided with access by a lintelled passage and an external doorway. It was not built with mortar or cement of any kind; its stones were unsquared, and bore no mark of any tool; its roof was partly flat and partly arched by the overlapping of the stones, but in all these respects its constructional features were not different from those of the dry-built structures of the early Christian period or of the Iron Age of the Pagan time; but its singularity of form, and the absolute individuality of its architectural conception, precluded the possibility of assigning to it any relationship with them. In point of fact, they had hitherto met with no form of structure to which it was comparable.

THE ALTERATIONS AT HYDE PARK CORNER.

The tender of Messrs. Mowlem & Burt for carrying out the Hyde Park Corner scheme has been accepted, and the work of removing the Wellington Arch, preparatory to its re-erection lower down Constitution Hill, is, we regret to hear, to be commenced at once. There were three tenders sent in for the execution of the work, which includes widening the thoroughfares, namely,—Messrs. Mowlem & Burt, 31,000*l.*; Messrs. Hill & Higgs, 39,000*l.*; and Mr. Webster, 39,727*l.*

The only monumental entrance to London is thus to be destroyed, without, as we fully believe, any necessity. Is it even now too late to prevent this damaging act?

THE ST. LAWRENCE TUNNEL.

The contract for the projected tunnel under the St. Lawrence has been given to the engineer, Mr. Rouillard, of Montreal, who has undertaken to do the work for 3,905,000 dollars. The length of the tunnel is to be 16,000 ft., with a breath of 26 ft., and a height of 23 ft. The time within which the work is to be completed is three years. The gradients will be so steep that the line in the middle of the tunnel will be 176 ft. below the level of the entrances. Great attention is being attracted to this three-mile-long tunnel, which, of course, is to be illuminated by electricity.

Proposed New Bridge at Teddington.—It is proposed to erect an iron bridge over the Thames at Teddington, subject to the approval of the authorities. The members of the Teddington Local Board, together with the great majority of the ratepayers, are said to be in favour of the project, and a special meeting of the Board is about to be held to consider the matter.

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OBITUARY.

Mr. Lewis Pocock, F.S.A.—With great personal regret we have to record the death of this estimable gentleman, which took place at his residence, 70, Gower-street, on the 17th inst. The date of his birth was January 17th, 1808, so that he had nearly reached his 75th year. For many years he was one of the directors of the Argus Life Office, and in 1842 published a book on Life Assurance. He brought out some other works, notably "The Lord's Prayer," a poem by the late Dean Alford, and an edition of "The Pilgrim's Progress," published by Holloway, in which the Bibliographical chapter bears his own name. Mr. Pocock was treasurer of the Graphic Society, and worked very ardently in the cause of the Society for the Prevention of Cruelty to Animals. During many years of his life he was occupied with making a collection of Johnsoniana. This collection was begun when he was quite a young man, and grew to be of great interest and importance. It may be worth note that as long as thirty years ago he devoted much time and attention to the bringing out of a patent for electric lighting. He was before his time.

It will be inferred that Mr. Pocock was always a zealous worker in the cause of art. He will be chiefly remembered, however, in this respect from his long connexion with the Art-Union of London, of which he was one of the founders. He became one of the honorary secretaries soon after its foundation, and laboured assiduously and continuously in that capacity down to the day of his death, often working all night with his colleague in the earlier years of the Association, when the paid staff was small and the difficulties which beset the establishment of the Corporation were greater than would be supposed by those only now connected with it. Mr. Pocock leaves a considerable family, more than one of whom have already made their mark as artists. At a meeting of the Council of the Art-Union of London, held on Tuesday last, the following resolution was passed unanimously:—

"The Council of the Art-Union beg to express to Mrs. Lewis Pocock and the family their sincere sympathy under the heavy affliction which has overtaken them; as well as their sense of the great loss which the Society has experienced by the removal of one who, for forty-five years, devoted the most assiduous and uninterrupted attention, as one of the Honorary Secretaries, to the direction of its affairs, for which his refined taste and matured judgment eminently qualified him."

AMBIGUOUS SPECIFICATIONS.

Sir,—Some unknown friend having kindly sent me a Kentish paper, I scanned its columns in search of news, when my eye lighted on the report of the meeting of the Walmer Local Board, and I saw there had been a row over "the strict intent and meaning of a specification." Some knowing persons (they are to be found in most public bodies) complained of the way in which a well-known contractor had executed his contract for road-making, and stated, with more or less point and fervour, their ideas of road construction. One of these gentlemen, it is reported, argued "that the contractor ought to have put gratings down which he had not done," and added, "no other practical man would have undertaken that job without putting down a grating on each side of the road," in confirmation of which latter remark, he appealed to builders on the Board for their views of the proper performance of the work. And, as a clinching argument, he said the contractor "brought the new gratings there to lay down, and now they are back again in his yard."

The Clerk to the Board defended the contractor from the charge of responsibility, saying "that, having read the specification, he was of opinion that the contractor's responsibility was confined to the footpaths and channelling, and that, *though there was much ambiguity in the wording of the specification*, he thought there was nothing which required the contractor to raise the crossing right across the road." And, as regarded the "gratings" contention, "the specification simply required the contractor to take up gully-gratings, and build a new pit, *but there was nothing said about what was then to be done.*"

There could hardly be a better description of an ambiguous specification, hardly a better illustration of its results. The Board thought the contractor wrong; their Clerk pronounced him right; and the contractor himself had evidently been at one time in doubt. His name is, however, too well known, and his respectability is too well assured, for any to question his disposition to perform his work aright. Had he been wrong, the blame would fairly have rested with the specification which few read alike; but, having been right, blame as fairly rested with the specification, since it laid him under the suspicion of having been wrong. Ambiguity gives rise to obscurity, obscurity to uncertainty, uncertainty to different interpretations, and different interpretations give rise to possible errors and imputed breaches.

A clearly-worded specification would have prevented the hubbub. It would have set forth unmistakably what had to be done; and the contractor, actuated by his usual desire to work creditably, would have complied therewith. No specification is clear which does not thoroughly explain the nature of work, and contain full particulars of the mode of execution. Gratings were on the job, but their use was not specified, consequently they were removed. They might or might not have been necessary. If necessary, they should have been specified. Not being specified, their use would have seemed a work of supererogation, and that is just the kind of work for which Local Boards and Corporations never think of paying.

A specification cannot possibly be too clear or too simple. Speaking generally, clearness is almost unattainable without simplicity; and too many specifications are devoid of both. Often, when taking off quantities, the greatest annoyance has been caused by wholesale omissions and sweeping generalisations. Insufficient information, and a jumble of works, are enough to try the patience of a saint. Looking now on one page, then at another, now backward and now forward, for descriptions, undiscoverable perhaps, or contained only in vague and scattered allusions, and then conflictingly, a correct inference must be the result of chance.

Ambiguous specifications are due either to carelessness or want of practical knowledge. In either case they are to be condemned. In the former case, they are especially to be condemned. There may be an excuse for a want of practical knowledge; there is none for carelessness. Orderly arrangement and adequate description are naturally to be expected. The specification is as needful as the drawings, and if it be incomplete the architect's work is imperfect, and so, in all probability, will be the work of the builder. The incompleteness of a specification is a sure sign of an unstudied building. A well-prepared specification proves thought, and makes the architect master of his design. But if he do not himself understand it, he cannot expect others to understand it. They may guess at his meaning; but guesses, when money, appearance, and durability, are at stake, are not advisable. Obscure intentions cannot be embodied in lucid instructions. Nor can obscure thoughts. Want of knowledge may sometimes be concealed in generalities; but in specifications, when concealed, it is often revealed. The studious avoidance of practical details tells its tale; and when generalities soar, the result is not invariably happy.

Stereotyped specifications are likewise the cause of confusion. Stereotyped specifications are mostly ambiguous specifications. Specifications to be serviceable should be adapted to requirements; and, as the requirements of no two jobs are alike in every respect, the stereotyped specification will only apply in part. Cutting out and inserting in no way improve them. Every job requires its separate specification. The outline, or general arrangement, of specifications may be,—in fact, should be,—similar, so far as the test of practice stamps it with approval. But all the nice explanations of details required for each job should be strictly original, and introduced at the right places, that the estimator and the foreman may readily comprehend the architect's wish or intention.

The idea that an imperfect specification tends to the closer study of the drawings, and, consequently, to the better execution of the work, may or may not be correct. If correct, the architect should divide the commission with the builder, since the expense of the time spent in puzzling out the specification and the design has to be borne by the latter. It would seem much more reasonable to suppose that, as time is money, and economy a prominent feature in builders' business, when drawings conflict with the specification, and practical requirements conflict with either or both, the puzzle is solved by these practical requirements being settled off-hand by the practical judgment of the practical man. The solution might be anything but what the architect might desire, but, not having taken the trouble to specify his wish, he has to abide by the consequence. Hidden work is dumb.

With regard to ambiguous specifications arising from unpracticalness, some suggest,—to the architect the design, to the builder the construction. But while the union of art and practicalness is desirable, this particular union is not to be commended. Rival interests clash. To be of advantage, art and construction must be united in one,—the designer of the work. The sounder his knowledge of construction, the clearer will his specification be. Less time would be wasted, fewer disputes would arise, fewer mistakes would occur. If architects could but hear the sneers of foremen and workmen at some of their specifications, they would not feel particularly flattered, but might be led to think a specification deserving of more attention than it generally receives.

Ambiguous specifications are downright evils. They offer loopholes for evasions and furnish grounds for exactions. To them is doubtless attributable the great difference frequently seen in tendering. As read by some, certain works are suggested; as read by others, these works are overlooked. The shrewd, careful reader notes that certain works are necessary, but he does not provide for them, knowing to a certainty that others will not. Were he to provide for them the job would be lost, and if he lost the job he would for certain nothing gain; whereas, by taking it in its incompleteness he has at least the possibility of gain. The bareness of the possibility is a strong temptation to wrong. Thus it is that swindling occasionally begins with putting in the foundations and ends with scrubbing the floors. Where lies the fault? In the architect's office or the builder's? The truthful answer is,—in both.

Keenness of competition means lowness of price; lowness of price entails cutting of work; cutting of work is another name for theft, and theft by rights should send men to prison. When a builder takes work in the full consciousness of the specification's incompleteness, he burdens himself with the responsibility of the due performance of all things needful. However loose or vague a specification may be, it is pretty well sure to contain some such stipulations as these:—"The contractor shall provide for all works, and do all the several matters and things required for the thorough performance of the contract"; and "The contractor shall hand over the building clean and perfect throughout on completion." In submitting his tender, he announces his determination to execute the work in accordance with the specification, and since the specification requires thoroughness, honour asserts that thoroughness should be had. This, however, is no excuse for the architect. The work should be clearly specified in his office, then all would tender alike; fair prices should be obtained, and the evils of sharp practice should be banished. There will be a certain amount of sharp practice under any circumstances so long as men are in haste to get rich, but the fault and the blame would then rest with the evil-doer. If, when a specification is clear, or tolerably clear, the shifty contrive to disregard its plainness and wrest its obvious meaning, much worse must the case be with a specification that even the honest can barely understand. This proves the need of clearness. If the work of the ambiguous specification is honourably performed, the builder has to pay the penalty of the architect's negligence.

It is, of course, open to the builder to prefer a claim for extra work. Then come other evils. The claim is, perhaps, compromised. Omissions are made to set against extras; this may be just as between the architect and the builder; but is it just as between the architect and the proprietor? If the "extras" were necessary, and the "omissions" were likewise necessary, the house must originally and eventually have been a long way removed from the requisite completeness. If the claim is allowed, the builder receives justice. But how stands the case with the architect and the proprietor? It is then the latter who pays the penalty of his adviser's negligence. If, as sometimes happens, the claim is disputed, an angry controversy ensues; and, the architect being his own arbitrator, the builder goes to the wall. What [illegible] of justice between

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the architect and the builder? If, as sometimes happens, the claim is wholly ignored, the architect carries the point, the proprietor has his house,—but what becomes of justice between the three? Whatever works are necessary in the opinion of the architect, but not shown on his drawings, or set forth or implied in his specification, are justly deemed extras, justly claimed as extras, and should be justly paid as extras. To withhold payment for work executed is theft, as much as the wilful omission of contract work is theft. It is all very well to point to the clauses of an ambiguous specification, clauses wide enough to embrace everything under the sun, and show that the building is to be given up perfect. Ideas differ widely as to perfection. The man who has tendered from an ambiguous specification thinks his work perfection when he has executed soundly all necessary works. The author of the ambiguous specification may include in his idea of perfection many other works not actually necessary. This, therefore, should be an axiom in the composition of a specification:—Every essential work, and every work of opinion and taste, and all nice points of construction, should be clearly specified and explained; while all minor works, if not described at length, should be explicitly mentioned, or, at least, clearly implied.

Ambiguousness, the bane of ancient oracles, ought not to be the bane of modern specifications. Intended for practical men, they should be practical and to the point. Clearness and connexion, to be regularly maintained, call for a deal of attention, since each trade has to be described separately. The difficulty appears to be in describing fully those works connected with or dependent upon other work of the same trade or of other trades. To overcome the difficulty, greater length would appear necessary; but lengthy clearness is infinitely preferable to condensed uncertainty. Specifications, however, are not always read with care by masters in tendering for work, or studied by foremen in executing work, so that it is probable that greater length, although desirable for the sake of clearness, would not altogether be appreciated. While some complain of the vagueness of specifications, and others of their lack of particulars, not a few complain of their fulness, meagre though it be. The last are they who either dislike the trouble of wading for information, or have not the time to waste in such a task. Still it is possible to combine full directions and descriptions with clearness of language, connexion of works, and system of arrangement. A specification having this union must commend itself to all.

The specification is the Book of the House, a book of constant reference, and should, therefore, like most other books of reference, have a complete index. This index would not only make reference easy, but also secure connexion otherwise unattainable. The several points of allusion being readily found, a perfect description of every item of work would be obtained, and its connexion with the work of every other trade would be clearly presented. The specification requires little if any less study than the drawings. Rightly viewed, it is an integral part of the design. Till the specification has been written the design is imperfect. A specification's searching criticism will always bring defects to light. It is better for the architect to detect and remedy them than for the builder to do so when expense has been entailed.

In design of the first importance, in practice drawings are of secondary importance. In the workshop and on the job they become merely the pictorial illustrations of the specification. How necessary, then, that the specification should be thoroughly well considered and clearly expressed. OBSERVER.

Substitute for Gypsum.—A prize of 500*l.* was some years ago offered by the German Government for the invention of a composition for taking casts of works of art and other kindred purposes. This composition was to possess the advantages of gypsum, but was also to have sufficient power of resistance to bear periodical cleaning, or other treatment of an analogous character. No less than forty-one competitors entered the lists, but none of the proposals submitted were of a nature to satisfy the official and artistic commission charged with the examination of the various suggestions. The prize has, therefore, not been awarded.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.

SOME of the members of this Association made an excursion, on the 14th inst., to Halesowen and the neighbourhood, adopting a programme arranged by the honorary secretary (Mr. F. W. Franklin Cross). The Royal Manor of Halas was granted by King John, in the sixteenth year of his reign, to Peter, Bishop of Winchester, for the purpose of founding an abbey, which was first inhabited by monks of the order of White Canons, and which shared the fate of so many other monastic buildings at the dissolution, in the reign of Henry VIII. An idea of the importance of this religious establishment may be imagined from the fact that the site of the abbey church and other appendages within its boundary walls occupied eleven acres of land. The ruins are extremely meagre; the stone of the columns, pillars, and arches was used for many centuries to repair the roads in the neighbourhood. What remain, however, form a picturesque group, worthy alike of the attention of the artist and the antiquary, but consist of only a few examples of fine lancet-windows, with fragments of groining and moulded work. The Church of St. Mary and St. John the Evangelist is an ancient structure, it being claimed for it that portions of it were built prior to the Norman Conquest. In the town was born the poet Shenstone, and in this church reposes his dust. During the time of the Heptarchy, when the kingdom of Mercia comprised the Midland Counties, Kenulph, king of Mercia, died, leaving his son Kenelm heir to the kingdom. He was very young at his father's death, and, through the artifice of his sister Quendrade, who entertained the ambitious views of assuming the government of this the largest kingdom of the Heptarchy, he was deprived both of his crown and his life. At the eastern side of Clent Hills stands in all its solitude a monument of this dark and cruel deed, the Chapel of St. Kenelm, whither the members journeyed after leaving the church and abbey. The situation of the chapel is remarkably picturesque. It is built over a ravine, on the declivity of a hill. St. Kenelm's Well under the chancel marks the spot where the young prince was buried after being murdered. The greater part of the fabric is not older than Henry III.'s time; the tower is of about the time of Henry VIII.

THE MANCHESTER FINE ART AND INDUSTRIAL EXHIBITION.

THIS Exhibition, which is being held in the St. James's Hall, Oxford-street, Manchester, was opened on the 20th inst. by the Earl of Wilton. It is spoken of as the best exhibition which has been held in Manchester since the well-remembered "Art Treasures" Exhibition of 1857.

Among the exhibitors is the well-known firm of Gillow & Co., who have erected and furnished four rooms,—a dining-room in the Italian style, a drawing-room in the Adams style, a morning-room in the Flemish style, and a bedroom in the Queen Anne style, — the drawing-room containing all the furniture used for the boudoir of the Princess of Wales when she visited the Paris Exhibition in 1878. In the Italian dining-room one of the features is a reproduction in tapestry of Mr. J. O'Connor's cartoon of "Windsor Castle." One of the most important displays is that made by William Morris & Co., of Oxford-street, London. Here will be seen not so much in the way of furniture as of tapestries, silks, velvets, and other stuffs, figured from Mr. Morris's own designs, and a number of hand-woven carpets, also made from his designs. Mr. G. F. Armitage, of Altrincham, has furnished a room with the idea of showing at what a moderate cost a sitting-room can be tastefully fitted up, and the whole of the articles have been manufactured from his own designs. Messrs. Kendal, Milne, & Co., of Deansgate, Manchester, have erected a drawing-room of octagon shape, furnished in the style of the Renaissance, the chairs, tables, settees, &c., being of black wood with ebony carvings, and handsomely decorated. The speciality of their show is the Tynecastle tapestry for walls, which is made of flax and shows the grain. Over this hang some drawings which have been executed by Mr. Lockhart, R.S.A. Messrs. Doveston, Davey, Hull, & Co., of Manchester, have fitted up a reception-room and bedroom on the platform. The furniture in the bedroom is described as being in the Early English style, whilst that in the reception-room is of the fashion of the seventeenth and eighteenth centuries. Messrs. Procter & Co., of London, show a collection of objects of Indian art, including carved furniture, decorative pottery, enamelled and metal work, Indian fabrics, gold, silver, and enamelled jewelry, and Indian bangles, arms, and shields; they have enclosed their display by an architectural front designed in the Oriental style. Sir Humphrey de Trafford has loaned an Italian cabinet and a number of Florentine bronzes, which are exceedingly interesting. In the pottery department, Mr. E. H. Downs, of Manchester, has a good display of porcelain, Dresden china, and Hungarian work. Messrs. Doulton & Co., of Lambeth, have on view some excellent specimens of their now well-known and esteemed Doulton ware, Lambeth faïence, impasto, *pâte sur pâte*, and silicon ware, their latest development being the modelled silicon, which has the effect of bringing out the different clays made use of in producing the article. The whole of this work is done by hand. The Gateshead Glass Company have a good show of domestic glassware, and Messrs. Minton, of Stoke-upon-Trent, contribute a fine collection of majolica, pottery, porcelain, and ordinary artistic faïence. The Venice and Murano Glass Company make a contribution to the exhibition in the shape of Venetian glassware, mosaics, &c. Messrs. Wm. Cook & Co., of St. Ann's-street, Manchester, show at their stall the operation of engraving on glass. Messrs. Jones & Willis, of London and Birmingham, have a show of ecclesiastical brass and other work, including a reredos in carved oak and a variety of other woods, an eagle lectern, and a large embroidered altar-frontal. Messrs. Hart, Son, & Peard, of London, Messrs. Dutton & Powers, of Manchester, Messrs. Thomasson & Co., of Manchester and Birmingham, and Messrs. Thos. Brown & Sons, of Manchester, display ecclesiastical brass and embroidery work of a very rich character, and Messrs. Elliott, Alston, & Olney, of Manchester, contribute *repoussé* brass work, a number of inlaid fire-places, and a Sienna marble chimney-piece. Messrs. Leech Brothers and Hoyle, of Manchester, also make a display of chimney-pieces, fire-grates, &c. The exhibition contains some good wall-papers, sent by Messrs. Jeffrey, of London. Messrs. Heighway & Sons, of Manchester, are also contributors in this department. Some decorative wall-painting on tiles is exhibited by Messrs. W. B. Simpson & Co., of London. Messrs. Farmer & Brindley, of London, have sent specimens of marbles and other minerals suitable for architectural work. In the front hall, apart from the spacious room in which the exhibits we have already referred to are placed, will be found a collection of tapestry from the Royal Windsor Tapestry Works. They are sent as examples of the revived art of tapestry weaving which has been inaugurated at Windsor by the Duke of Albany. They are all hand-woven, and those which hang on the end wall have been made for Mr. Vanderbilt, the American millionaire. In the same room is some old embroidery which belonged to Dante Gabriel Rossetti, and which has been lent by Mrs. W. A. Turner, of Manchester. Messrs. Tassinari & Chattel, of Lyons, exhibit a rich collection of satins, silks, brocades, and velvets; and Messrs. William Woollams & Co., of London, take up one whole side of the room with a display of excellent wall papers. The suite of ante-rooms in front of the building is devoted to an exhibition of stained glass. Mr. William Morris, of London, shows a window, designed by E. Burne Jones, and the subject of which is Solomon giving instructions for the building of the Temple. In this department the other exhibitors are Mr. W. F. Dixon, of London, Messrs. Cox, Sons, Buckley, & Co., of London, and Mr. J. G. Sowerby, of Gateshead. In the three galleries upstairs there are a large number of oil paintings, water-colour drawings, engravings, etchings, autotypes, hand-painted plaques, embroidery, silks, brocades, &c., which are well worthy of inspection, and which will doubtless add much to the attractiveness of the exhibition.

Ayr.—At a special meeting of the Ayr Town Council, held on the 23rd inst., it was stated that the total cost of the new town-hall and municipal buildings amounted to 38,917*l.*, being 5,704*l.* more than the original estimates.

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THE LIME PROCESS OF COAL-GETTING.

The opening lecture in the Coal Mining Department of the Yorkshire College was delivered in the Philosophical Hall, Leeds, by Mr. A. Lupton, the subject of the discourse being "Coal-getting by the Lime Process, and other Flameless Substitutes for Gunpowder." Mr. Lupton having dealt with the processes for getting coal without the aid of explosives, said that the last method introduced was the lime process. It had been known for ages that quicklime had the potentiality of heat and power. When mixed with water, it developed considerable heat, and expanded in volume. It was not until recently that a practical method of using quicklime for coal-getting was discovered. In this process lime was applied in exactly the same way as gunpowder, only in a much larger quantity, 10 lb. of lime being used in a charge when one-third of a pound of gunpowder would suffice. After the holes were drilled, they were charged with the purest kind of lime, in the form of a cartridge, 4½ in. long by 2½ in. in diameter. The pressure was 1½ tons to the square inch, and the cartridges, as soon as made, were packed in an air-tight box. Seven cartridges were rammed into each hole, which was then stemmed with clay. When the holes were charged, a hand force-pump was connected by a flexible tube, with small tubes projecting from each hole, and fitting into grooves moulded on the sides of the cartridges. By this means a given quantity of water was pumped into each hole, equal in bulk to the lime. A tap at the end of each tube was closed, and in one or two minutes the chemical action of the lime and steam caused great heat, which converted the remaining water into steam. The pressure of this steam caused the coal to crack. In a short time the steam either escaped or condensed; still the lime continued to work and expand, and on examining the cartridges after they had broken down the coal, it was seen that they had enlarged the bore-holes. About half an hour after the charge had been watered, the sprags might be withdrawn, and the coal would come down. This process had been successfully tested in hundreds or thousands of cases in South Wales, Lancashire, Durham, Derbyshire, Yorkshire, Belgium, and elsewhere, and had been approved by many competent mining engineers. Compared with Grafton Jones's hydraulic wedge, the lime process had the advantage of cheapness, safety, and economy of labour. Calculating the cost compared with gunpowder, the balance of profit might be found on the side of the lime process.

RECLAMATION OF IRISH BOG.

In former volumes of the *Builder* we have shown how idle hands might be employed, and starving mouths filled, by the reclamation of waste lands. If ever there was a country affording scope for such enterprise, it is surely Ireland. Little has been done there in this direction, although Mr. Mitchell Henry, in a letter to the *Times*, shows that such work of reclamation can be profitably undertaken. The piece of land to which his figures relate consists of thirteen acres of deep bog, for the drainage of which the medal of the Royal Agricultural Society of Ireland was awarded. It forms part of a tract of several hundred acres, more or less reclaimed, of which the judges report that the bog was from 5 ft. to 10 ft. deep, and it is the worst piece of land that it has been attempted to improve. Except in the driest weather, cattle could not cross it, and it contained swallow holes or soft underminings of slush, which continued to discharge mud and water for many weeks. For shooting purposes it may be taken as worth annually 1s. an acre, and that was its only value, but now converted into cultivated land it is worth, after six years' cropping, 1*l.* an acre, and, with a trifling exception, it has repaid all the capital expended on it. These are striking results, especially as in the balance-sheet nothing has been estimated for the buildings or for superintendence, or for the proportion due by this bit of land to the cost of a large arterial drain, serving both as a canal to convey produce, and to cut off the mountain torrents. The margin of profit, however (Mr. Mitchell Henry goes on to say), is so large that a great reduction may be made, and yet establish the proposition that if capital and superintendence are forthcoming, land apparently most unfavourably situated can be reclaimed and made the homes of peasant proprietors, each with thirty or forty acres, at a profit to the State both pecuniarily and morally.

Mr. Mitchell Henry concludes his letter by dwelling on the disastrous results likely to accrue to Ireland from neglecting to carry out systematically, and on a national scale, a well-ordered scheme of land reclamation.

SURVEYORSHIP ITEMS.

Croydon.—The Croydon School Board have elected Mr. Robert Ridge, of 7, Katharine-street, Croydon, to be Surveyor to the Board in the place of Mr. Howard Martin, resigned.

Melksham.—Mr. David Mackenzie, of Glasgow, has been appointed land surveyor and inspector of nuisances and local surveyor to the Melksham Highway Board, the aggregate salaries amounting to 130*l.* per annum. There were eighteen candidates.

Mile-End.—Mr. J. Knight, formerly Surveyor to the Vestry of Mile-end Old-town, and latterly a member of that body, died on the 18th inst.

Poole.—After a residence in Poole of some four years, Mr. H. Miller, formerly of Bristol, has resigned his office of Borough Surveyor, being about to join a large firm of engineers in the North. At a meeting of the council on the 13th inst., the resignation of Mr. Miller was read and accepted, a unanimous expression of good wishes being given effect to. Then arose the question as to how the vacancy was to be filled. Mr. Conway proposed and it was seconded that the appointment be advertised. Mr. Curtis, proposed, and Mr. Hudson seconded, as an amendment, the appointment of Mr. John Elford, a former candidate, at a salary of 150*l.* a year. This was carried.

PUBLIC-HOUSE PROPERTY IN THE METROPOLIS.

EVIDENCES OF DECREASED VALUE.

Whatever may be the rate at which property generally in London is increasing in value, it does not appear just now to apply to public-house investments. Last week, at a sale of several properties of this description, which was held at the Masons' Hall Tavern, Basinghall-street, the prices realised fell far short of what was expected. In one instance, the offer of a well-situated City tavern was withdrawn, as the highest bid was some 30 per cent. less than the sum paid by the vendors. The Exeter Arms, Burleigh-street, Strand, described as commanding a trade of a most profitable character, derived from theatres, halls, markets, and other places of amusement and resort in the neighbourhood, with a long lease, was sold for 4,100*l.*, the auctioneer stating that the same property realised 6,000*l.* only a very short time since. Another instance was that of the City Wellington in Fleet-street, an old-established house. Though the value of the house, as situated in one of the busiest thoroughfares in London, was enlarged upon, the highest offer made was 1,820*l.*, and the auctioneer stated that only very recently the sum of 5,000*l.* was given for the property. As the price offered did not amount to half the reserve, the property was withdrawn. Possibly the spread of the Temperance movement, of which the "Blue Ribbon Army" is the latest phase, may have something to do with this falling-off in value.

ANCIENT LIGHTS.

LONDON TAVERNS CO. *v.* DONNINGTON.

This was a motion which came before Mr. Justice North (sitting as vacation judge) last week. It sought to restrain the defendant from erecting some buildings opposite the Albion Tavern, Aldersgate-street, so as to obstruct the windows of that tavern.

Hitherto, until recently, there had been some not very lofty buildings (including Shaftesbury House) on the opposite side of Aldersgate-street to the Albion, but these had now been pulled down, and in their place and on the site of them very extensive new buildings were being built by the defendant. There being some apprehension that these buildings might affect the plaintiffs' rights, Mr. Chatfeild Clarke, of Bishopsgate-street, wrote to the defendants, who then gave this undertaking:—"We are of opinion that the buildings can be erected in conformity with the drawings submitted to you, without injury to your clients; but in order that we may have the opportunity of discussing the matter fully, we undertake that no part of the proposed buildings shall be carried up beyond a height of an angle of 45° from the sill of the ground-floor windows of the Albion Tavern until we have an interview with you; we think it will take two months to erect the buildings to the height we have mentioned." That was on August 6th, and the next letter was written by Messrs. Taylor & Locke, the defendant's architects, on October 10th. In that letter they said:—"We feel satisfied that after the interview you will be of opinion that the Albion Tavern Company have no grounds for asking that the building should not be carried out on the plans submitted with our undertaking." Later on Mr. Chatfeild Clarke reported that the works were being rapidly pushed on, and the plaintiffs gave notice that in the event of the building being raised up beyond an angle of 45° from the sill of the ground-floor windows of the Albion Tavern, a mandatory injunction would be applied for. Notwithstanding this, the building had been proceeded with, and the buildings were now 8 ft. above the angle of 45°, and were 79 ft. high, the former buildings being only half the height.

His lordship granted an injunction over the first motion day in next sittings restraining the defendants from putting up the building any higher than it is at present.

CASES UNDER BUILDING BY-LAWS.

PARTY-WALLS: LAPSE OF TIME.

Thomas Casey, a builder, living at 88, Boleyn-road, Kingsland, was summoned by the Clerk to the Leyton Local Board of Health, Mr. Ralph Vincent, for contravening the 26th By-law of the said Board by neglecting to put up party-walls to the houses he erected on the Ley Spring Estate, Leytonstone.

William Dawson, the surveyor, deposed that the defendant simply erected a sort of party-wall in the front part of the house, so that any one on the road would imagine there was a party-wall right through, but, in point of fact, there was none at the back. He had given the defendant several notices to erect the wall in accordance with the By-laws, but that had not been done. At length the defendant positively refused to do the work: hence the proceedings.

The defendant said he received no notice whatever until after the roofs were covered, and it would be very hard to cause him to erect one now, as there were hundreds of houses built in the same way as his in Leyton and Leytonstone.

The Clerk said the latter statement of the defendant was not correct.

The Magistrate said the defendant must comply with the By-laws, and to enable him to do so the case was adjourned for a week.

Charles Sutton, a builder, of Bethnal-green, was summoned by Mr. Houghton, Clerk to the Walthamstow Local Board of Health, for erecting a wooden building on the Haile Park Estate, Walthamstow, without having given notice of the same, and deposited plans.

It could not be proved that the building had been erected within the past six months, and

The Magistrate accordingly dismissed the summons.

THE POMPEII FRESCO OF THE "JUDGMENT OF SOLOMON."

The recent disinterment of a wall-painting at Pompeii (now placed in the Naples Museum), representing the "Judgment of Solomon,"—an episode generally considered to have been unknown beyond the circle of Jewish tradition,—has been the cause of some controversy, owing to the apparent difficulty of accounting for such a scene being portrayed in a pagan city at so early a period. It seems, however, to have escaped notice that this is not the first occasion in which a Gentile artist appears to have selected this subject; for in 1880 the late M. de Longperier, at a meeting of the French Academy, described an engraved gem also presenting a picture of the scene. The small intaglio to which he referred forms part of the collection at Bucharest, to which city it was presented, with other antiquities, by M. C. Cohen, and M. de Longperier's remarks were illustrated by a cast.

The engraving contains six figures, one of which, of preponderating stature, is seated upon an *okladias*. He is robed in a long tunic, and holds in his hand a naked child, suspended head downward. Behind the seat a person of smaller proportions stands dressed in a short tunic. Facing the seated man are two females, one kneeling, the other with outstretched arms, as if in supplication, and close to them stands a helmeted soldier, with a buckler, and brandishing his sword. That the person of proportionately larger size is a king is evidenced, because his head is encircled by a diadem. The value of this relic depends necessarily almost entirely upon whether it was produced before the spread of Christianity had disseminated

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the story of Solomon's wisdom all over the East, or is merely the handiwork of some Christian or Gnostic artist. Upon this question no one could be more confidently relied upon to arrive at a correct conclusion than M. de Longperier; and he, after a most careful consideration, was of opinion that it was pre-Christian. For a complete appreciation of his reasons for this decision the reader must refer to the report of his paper; but a few of the principal ones may be mentioned. For instance, the workmanship is very Oriental in style, and in this respect the figure of Solomon bears a distinct resemblance to those figures familiar to us on Assyrian and Babylonian cylinders, and there is every reason to believe that the intaglio comes from some place adjacent to those countries, for the donator, M. Cohen, resided for a long time at Bagdad. However, the drawing of the women, especially the one in an attitude of supplication, is more like the style exhibited in Greek bas-reliefs or vase-painting. For this and various reasons, M. de Longperier assigns the stone to a somewhat late epoch, but still previously to any possibility of Gnostic or Christian influence. It is needless to point out that the Pompeian painting is confirmatory of M. de Longperier's opinions, whilst the Bucharest gem tends to show that it is quite probable that the history of "Solomon's Judgment" had, although doubtless with much-perverted details, spread as far as Italy before A.D. 79. JOSEPH OFFORD, M.S.B.A.

THE BOMBAY MARKETS.

SIR,—I shall be exceedingly obliged if you will insert the following explanation with reference to Mr. Russel-Aitken's letter in the *Times* of October 18th, in which he says I only designed the architectural details of the Bombay Markets, which statement gives rather a false impression.

The markets at Bombay cover some acres in extent, and were arranged, planned, and carried out,—as to the iron sheds,—by Mr. Aitken, the ornamental portions of the ironwork being from my designs.

But the whole of the stone entrance buildings, with the clock-tower and the façades facing the esplanade, were wholly designed and carried out by me under instructions received from Mr. Arthur Crawford, the Municipal Commissioner, originator of the markets, and after whom they were called, Mr. Aitken having nothing to do with them beyond a general supervision as Municipal Engineer. WM. EMERSON.

SEWER VENTILATION.

SIR,—In your issue of last week [p. 540] "Another Poor Buffer," in referring to the sewer into which his house-drains debouch, says:—"Every time there is a heavy rainfall the sewer-gas is driven into my house through the scientific (?) traps, which are oftener than otherwise dry."

In this case your correspondent would wish us to believe that *his drains* are all right, and the sewer alone is at fault. Now, if what he says is true about bad smells being "driven" into his house every time there is a heavy rainfall, it strikes me he had better get his own drains, &c., examined by a competent party before he again rushes into print exposing their bad condition. It will be time enough for him to blame the *sewers* after he has taken the beam out of the eye of his own drains and pipes.

It is quite customary for me to find that the real cause of bad smells often complained of is not "gas" from the common sewer, but foul odours from the complainer's own drains and pipes.

W. P. BUCHAN.

BIRMINGHAM.

Exhibition of China-Paintings.—An interesting exhibition of paintings on china, which has been annually promoted by Mr. R. W. Thrupp, of New-street, has reached its fourth year in the display now open to the public at Mr. Thrupp's gallery. This year prizes for the encouragement of the art have been given by several ladies. Nearly 450 exhibitors, some of them ladies and some of them gentlemen, some of them professionals and some amateurs, have sent in works from all parts of the country.

St. Mary's Garden.—On the 16th inst. a welcome addition to places of public recreation in Birmingham was made by the opening of St. Mary's Garden, which is situate in a densely-populated neighbourhood. The disused churchyard of St. Mary's has been transformed into a pleasant playground for the young of the neighbourhood, and makes an agreeable resort for older inhabitants. The garden covers two acres and a half of land, and the cost of laying it out has been about 1,500*l*. The principal entrance to the garden is from Whittal-street; there is another in Loveday-street, and two others in Weaman-row and St. Mary's-row. The work of planting the shrubs and flowers, and generally converting the ground into its present aspect, has been carried out by Mr. Alfred Rodway, curator of public parks, from the plans and designs prepared by the Borough Surveyor. The ground and the walks are paved with the Val de Travers Paving Company's limestone paving; and this part of the work has been carried out under the superintendence of Mr. J. Gadsby, the local manager of the company. In the centre of the garden, which is provided with several sheltering-sheds, there is a drinking-fountain, which is also close to the children's playground.

SEWAGE TREATMENT.

Aylesbury.—Representatives of the Corporation of London, the City Commissioners of Sewers, the Metropolitan Board of Works, and of many other bodies interested in the solution of the sewage problem, together with several engineers, chemists, and other men of science, visited Aylesbury on the 19th inst. to inspect the Native Guano Company's works, and the show of farm and garden produce grown with the "native guano" at Aylesbury. The "A B C" process (alum, blood, charcoal, and clay) has been now some years before the public, although its operations up to the present time have been confined to Aylesbury. The sewage of the town flows to the works through the ordinary pipes by means of gravitation. First of all a grating is fixed to prevent anything in the shape of rags passing through. Immediately beyond the grating the sewage is met by a side current of the "A B C mixture." After flowing a few feet a precipitating agent is added in the form of alum, which completes the materials necessary for purification. It next flows along a channel to a large tank at the end, and after passing round, it returns to another channel, having meantime deposited most of the impurities. After passing through two more tanks, the process of treatment is complete, and the effluent water, perfectly clear, flows through a channel into a tributary of the river. At certain intervals the sediment or residuum left at the bottom of the tanks is removed by means of a pumping-machine, and converted into powder or cakes, and sold for manurial purposes at the rate of 3*l*. 10s. a ton. Its fertilising effect was shown at the exhibition of farm and garden produce in a tent close by. Altogether there were 441 entries, the principal ones being made by farmers, cottagers, amateurs, and gentlemen's gardeners, and the exhibits included potatoes, mangels and swedes, cabbages, carrots, turnips, barley, oats, wheat, flowers, &c. The produce came from different parts of the country, but was all the result of the application of the sewage manure. The specimens were, we are told, almost without exception, of very fine quality and appearance. The Right Hon. the Lord Mayor, who was among the visitors, in the course of a speech after the luncheon which followed the inspection, referred to the pestilential consequences of the manner in which the sewage was now dealt with in the metropolis and around our coasts. He believed that in the end we should be compelled to adopt some system of precipitation of the solid matter, clearing the water which had been originally contaminated, and letting it again flow into our rivers pure and free.

Brentwood.—The Brentwood Parochial Sanitary Committee, having visited the sewage works at Ealing, Middlesex, have determined to adopt the lime process as there carried out, and have asked Mr. Jones, the Engineer to the Ealing Local Board, to advise them as to plans, &c.

Forfar.—Sewage farms so seldom show a balance on the right side that when it is reported it is worth recording. The financial statement of the Forfar Sewage Farm for the twelve months ending the 15th inst. shows an income of 42*l*. 19s. 7d., and an expenditure of 25*5l*. 2s. 4d., leaving a balance of 16*9l*. 17s. 3d., for the 27 acres to which the town's sewage is applied, and the 13 acres which are not irrigated. It is stated that the crop from the sewage land realised 13*l*. 8s. 5½d. per acre, while that from the other portion only fetched 3*l*. 17s. 3½d. per acre.

Stoke-upon-Trent.—At a meeting of the Stoke Town Council on the 19th inst., the Sanitary Committee recommended that the farm be let to Mr. T. Wibberley, of Stone, for three years, at 120*l*. a year. Mr. Bilton pointed out that after receiving this rent the net loss of the Corporation with respect to their sewage farm was 38*6l*. The recommendation was agreed to.

CHURCH-BUILDING NEWS.

Bidston.—A new chancel has been added to the parish church of Bidston, having been erected by subscription as a memorial of the Rev. C. A. Graham (who was the incumbent and afterwards the rector of the parish for upwards of thirty years) and of Mrs. Graham, his wife, both of whom died last year. The cost of the chancel has been about 400*l*. Mr. Grayson, of Liverpool, was the architect, and the contractors were Messrs. Morbury & Upton, of Liverpool, for the pulpit, chancel, seats, and reredos; and Mr. Isaac Griffiths, of Claughton Village, for the masonry work. The style of the work is in harmony with that of the rest of the building, the new chancel projecting about 10 ft. into the churchyard. The consecration took place on the 17th inst.

Brighton.—The re-opening services of Holy Trinity Church, Ship-street, Brighton (well remembered as the church where the Rev. F. W. Robertson once ministered), were held on the 19th inst., after alterations. A change for the better has been made in the gallery and its supports, which seemed to be so heavily constructed. A higher elevation by 5 ft. has been made to the centre ceiling, which now exhibits the open wood-work construction in place of the former plastering. Gas pendants, so arranged as to light the whole building, hang from the ceiling. Tobin's system of ventilation is introduced. The work of restoration has been in the hands of Mr. Somers Clarke, junior, and the expenditure will be something over 800*l*.

Birmingham.—St. Mark's Church, Birmingham, was re-opened on Sunday, the 22nd inst., after having been cleaned and enlarged. This is one of the early churches built by Sir Gilbert Scott, in the year 1841. A chancel, organ-chamber, and vestry have been added, and the church has been thoroughly cleaned and painted, the work having been superintended by Mr. Miggett, and carried out by Mr. Wilson, of Soho.——The chancel and nave of St. Nicolas's Church, Lower Tower-street, have been enriched by the insertion of two additional lights in the east window, and the erection of a stone pulpit. The pulpit, which is entirely of selected Bath stone, has been executed by Messrs. Jones & Willis, from the designs of Mr. John Cotton, architect, 15, Temple-row, Birmingham. The two lights inserted in the east window complete the subject of the Crucifixion commenced a year ago. The work has been executed by Messrs. R. W. Winfield & Co., successors to Camm Bros., of Smethwick, and under the personal direction of Mr. T. W. Camm, at a cost of 120*l*.

DISSENTING CHURCH-BUILDING NEWS.

Clevedon (Somerset).—The erection of a new Wesleyan chapel and manse has been commenced at this growing watering-place. The memorial stones were laid on the 28th ult. The buildings are Early English in design, and comprise a chapel to seat 500 persons, a school-room to accommodate 200 children, in addition to which all necessary and suitable class-rooms and vestries are provided. The main walls and buttresses are to be of Pennant stone, with Bath stone dressings, sills, plinths, and courses. The architect for the works, which are being executed by Mr. W. A. Green, of Clevedon, is Mr. Herbert J. Jones, of Bristol. The total cost, inclusive of lighting, heating, and erection of boundary-walls, will be about 4,000*l*.

London.—On the 19th inst. the foundation-stone of a new Welsh Wesleyan chapel, in City-road, was laid by Mr. David Jones. The chapel will probably be completed by May. It will cost about 9,000*l*. The architects are Messrs. Wilson, Son, & Aldwinckle, 7, East India-avenue.

Carnarvon.—On the 16th inst. the ceremony of placing two foundation-stones of an English Presbyterian chapel at Carnarvon was per-

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formed by Mr. Richard Davies, M.P., and Mrs. Hugh Pugh (Llysmeirion). The site is in Castle-square, at the corner of Chapel-street, and has cost 1,500*l.*, and the estimated cost of the building is 2,349*l.*, making a total of 3,849*l.* The style adopted is a thirteenth-century Gothic. The whole contract has been let to Mr. R. R. Williams, of Carnarvon, who has already made good progress with the work. Mr. Richard Owen, Breck-road, Liverpool, is the architect under whose superintendence the work will be carried out.

Seaforth.—On the 17th inst. the opening services of a new Congregational church, which has been erected on a piece of ground at the corner of Elm-road and Gladstone-road, were commenced. The new building is of grey brick, with Stourton stone dressings, and will seat about 400 persons. It is so arranged that it can be used as a Sunday-school, with seven separate class-rooms downstairs, an infants' class-room, small lecture-hall, &c. The architect is Mr. Thomas Cook, of St. George's-crescent, Liverpool, and the contractor is Mr. James Holmes, builder, of Seaforth.

VARIORUM.

The eighth volume of "Proceedings of the Association of Municipal and Sanitary Engineers and Surveyors" (E. & F. N. Spon) is edited by Mr. Thos. Cole, the secretary of the association, and contains reports of the proceedings at meetings at Eastbourne, Stockton-on-Tees, York, Sunderland, Goole, and London. ——The number of *L'Art* (134, New Bond-street) for October 22 (No. 408), includes several illustrations of the Chaldæan antiquities, concerning which we have given our readers some particulars on another page of our present issue. The same number of *L'Art* contains an illustration of a very delightful drawing by Mr. Burne Jones, the "Chant d'Amour."—— In the current *Quarterly* will be found a perspicuous and interesting paper on "Greek Sculpture," and which we recommend for reading. It is noticeable that in tracing the probable origin of Greek sculpture no reference is made by the writer to the Chaldæan relics now lodged in the Louvre as already pointed out. Another set of readers will find interest in a paper, also in the *Quarterly*, on "The Fish Supply of London."

Miscellanea.

A Mortuary for Fulham.—At the meeting of the Fulham District Board of Works on the 18th inst., the committee appointed to consider the question of erecting a public mortuary for the parish reported that they had made inquiries as to a site suitable for the erection of a public mortuary, and had been in negotiation with the Hammersmith Burial Board for the purchase of a piece of land on the south side of the superintendent's lodge, Margravine-road, Fulham, and that they had instructed the surveyor to prepare a plan of a proposed mortuary, which they submitted and recommended to the Board for adoption. Mr. Mussared moved the adoption of the report, and it was carried. Mr. Jones (the clerk) read a letter from the Hammersmith Burial Board offering to sell the said land for 873*l.* The land offered is nearly half an acre in extent. After some discussion the offer was accepted. It is proposed that a coroner's court and *post-mortem* room shall adjoin the mortuary.

Fire at a Builder's.—The extensive building works at Southampton of Messrs. Bull & Sons, the builders of the new Law Courts, were totally destroyed by fire last week. The fire is supposed to have broken out in a blacksmith's shop at the rear of the premises, which are situated on the banks of the river Itchen, at Northam. The offices containing the books, papers, &c., being detached from the main body of the works, were not injured. Messrs. Bull are insured. In addition to Messrs. Bull & Sons' valuable plant, machinery, stock of seasoned wood, &c., a large quantity of prepared carving and other work for the completion of the Law Courts and for the new Houses of Parliament which the firm are now erecting at Cape Town was destroyed. A heavy loss also falls on the workmen by the sacrifice of their tools, and many of them will, it is feared, be thrown out of employment for some time.

Ephesus.—We referred last week (p. 543, *ante*) to the proposed further excavations at Ephesus, and some three months ago (p. 138) we reported pretty fully what was said at the Mansion House meeting in aid of funds for defraying the cost of continued explorations. Mr. J. Russell Endean protests against further excavations, and gives the following reasons:—

"1. The manner in which the excavations have been made is more destructive of the ruins than the effect of time could possibly be, for, instead of unearthing the buried records and glories of the past and presenting them to the eye-witness as found, the *débris* of one part so removed seems heaped up upon another, or has been returned to the pits whence removed, or has been scattered and levelled over a wide area, thus removing or obliterating such landmarks as might otherwise have been still standing; or, again, tomb after tomb has been entered and rifled, only to be left with utter disregard of the object for which they were made, and so the relics and resting-places of the illustrious dead have been desecrated.

2. Because whatever has been found, instead of being preserved on the spot, has been removed many hundreds of miles away from the scenes where discovered; and it is intended by the society above named so to remove whatever may yet be found of any value."

He goes on to ask, "Is it not possible to excavate this city as Pompeii has been excavated, to insure that whatever comes to light worthy of preservation shall be preserved on the spot, and that a museum of Ephesian antiquities shall be erected in Ephesus, or in its immediate neighbourhood, so that when the visitor from any part of the world looks upon the scene he shall no longer be told, 'You will find all the beauties of Ephesus in the British Museum, London,' but rather he should be shown where he stands all that can be found of this once-glorious city?" He is sanguine enough to believe that diplomatic representations as to the exceeding value and interest of the remains discovered and to be discovered would suffice to secure adequate protection for them.

Sir John Soane's Museum.—The London correspondent of a Birmingham paper, writing of Lincoln's Inn-fields, speaks of Sir John Soane's Museum as being located on the north side of the square "for no other apparent reason than that the College of Surgeons has taken possession of the other side." We are aware that Sir John Soane's interesting and unique library and collection of antiquities and works of art are not visited by the public to the extent which they deserve, but we thought everybody knew that they are located where they are because they remain in what was Sir John Soane's residence. In the year 1833, Sir John Soane obtained an Act of Parliament (3 Will. IV., chap. 4), entitled "An Act for Settling and Preserving Sir John Soane's Museum, Library, and Works of Art, in Lincoln's Inn-fields, in the county of Middlesex, for the benefit of the public, and for establishing a sufficient endowment for the due maintenance of the same."

Monumental.—Mr. Frank Priestman, sculptor, Darlington, has been for some time occupied on a bust of the late Rev. Dr. Chadwick, R.C. bishop of Hexham and Newcastle, and has brought his work to a successful termination. Some of the admirers and friends of the late bishop suggested the work, and placed the commission in the hands of Mr. Priestman. Numerous photographs were supplied, and these, with occasional hints from clergymen intimate with the late bishop, were the only data supplied for the construction of the model. It is difficult with such materials to revive well-known features, but on the present occasion it seems that an excellent likeness has been produced.

Personal.—We are requested to state that Mr. W. R. Glasier and Mr. W. R. M. Glasier have retired from the firm of Messrs. Glasier & Sons, surveyors and land agents, of Charing-cross, and that Mr. G. H. Brougham Glasier has taken into partnership Mr. Henry J. Dowden, who for many years past has been with Messrs. Driver & Co., of Whitehall. The style of the firm will still be Glasier & Sons.

The Builders' Benevolent Institution.—We may remind our readers that the thirty-fifth anniversary dinner of this Institution will take place on Thursday next, November 2nd, at the Freemasons' Tavern,—the president, Mr. J. T. Chappell, in the chair. Efforts are being made to mark the occasion by a substantial addition of subscriptions and donations to the funds of the Institution.

The Midland, Western, and Metropolitan Canal Carrying Company.—We are glad to see that the attention which has lately been given to the subject of facilities for canal transport of merchandise (primarily in our own columns) appears to be bearing fruit. In support of our position that commerce, especially in heavy goods, is largely dependent for prosperity upon facilities of cheap transport, and that water-carriage is cheaper than railway carriage, we have adduced ample evidence. We have therefore, earnestly advocated the development of our canal and river traffic, both by the utilisation of existing waterways and by the formation of connecting-links between them, so as to provide means of water-carriage to and from all parts of the kingdom. The Midland, Western, and Metropolitan Carrying Company (Limited), whose prospectus appears in our advertising columns this week, covers a large part of this programme, and should, if judiciously managed, prove to be a remunerative undertaking. The company has been formed for the purpose of providing increased facilities for the carriage and distribution of merchandise between the ports of Bristol and London and the Western and Midland Counties, and generally for carrying on the business of carriers by river, canal, railway, and otherwise, and for the warehousing of goods. With this view it is proposed to utilise the facilities already afforded by the existing canals and waterways, and to provide warehouse accommodation in the centre of the city of Bristol and at other points convenient for collection and distribution. The company has acquired a lease, with the option of purchase, of the Wilts and Berks Canal of about 69 miles, from a junction with the Kennet and Avon Canal at Semington, near Bath, to the river Thames at Abingdon, near Oxford, with all the land, buildings, reservoirs, wharves, and works in connexion therewith. The company has also arranged for the purchase of a large block of buildings containing ample warehouse accommodation, occupying a most central position in the city of Bristol, with a frontage of 396 ft. to the floating harbour, in close proximity to the establishments of the principal merchants and importers, and to the railway-stations. The matter of comparative cost of transit by railway and canal has been been very fully reported upon to the Wolverhampton Chamber of Commerce by Mr. Francis R. Conder, C.E. (who is the consulting engineer to the company). The following figures derived from his report show a saving of 64·7 per cent. in favour of canals, viz.:—

	Railway.	Canal.
Maintenance of Way	6·5	0
Do. Works	3·5	1·15
Repairs of Rolling Stock	9·5	3
Traction	8	4
Traffic Expenses	15	3
General Charges	7·5	7·5
Interest on Capital	50	16·65
	100	35·3

Mr. Conder has also reported upon the properties to be acquired by the company.

"Art in Costume."—In the Brighton County Court, on the 20th inst., a claim was made in the case of Coffin *v.* Taylor, for making a dress. The defendant pleaded that the plaintiff spoiled the dress. The plaintiff (indignantly), "I did make the dress properly, but the lady has no natural figure whatever. She said she was suffering from liver complaint, and could not be squeezed, and how could I make her look like Venus when it was all wadding?" At the request of the Judge the defendant retired and put on the dress, and his Honour then gave a verdict for the defendant.

A Lecture on Egypt was given last week by Mr. H. H. Bridgman, architect, to the members of the Hawley-road Young Men's Society, Kentish-town. Interesting descriptions were given of Alexandria and Cairo, of the Pyramids of Ghizeh and Memphis, the tombs of the sacred bulls and tomb sculptures, the Sphinx, old Cairo, Heliopolis, the museum at Boulak, and other places of interest visited by the lecturer in Lower Egypt.

New Law Courts.—We are asked to mention that Messrs. W. M. Pepper & Co. were selected by the late Mr. Street to do the ornamental lead-glazing for the refreshment-room, and that they have supplied the glazing for the whole of the courts and many of the corridors.

The P[illegible] Alice Memorial Hospital, East[illegible]ime of the clerk of works at [illegible]ted in our last) should hav[illegible] W. Geach.

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Putney New Bridge. — The contract for the construction of the new bridge and the extensive approach and improvement works connected therewith has been placed in the hands of Mr. John Waddell, of 4, Victoria-street. The *Engineer* of the 21st inst. gives some of the detail drawings. We extract a few lines from the specification accompanyingthem :—

Spans, &c.—The granite bridge shall consist of five arches, each with level springings 9 in. above Trinity datum. The five arches shall be proportioned thus :—Central arch : span, 144 ft. ; versine, 19 ft. 3 in. ; central headway, 20 ft. above Trinity datum ; radius of voussoir intrados, 144 ft. The two arches adjoining the central arch : spans, 129 ft. ; versines, 16 ft. 3 in. ; central headways above Trinity datum, 17 ft. ; intrados radii, 136 ft. 6 in. The abutment arches : spans, 112 ft. ; versines, 13 ft. ; central headways above Trinity datum, 13 ft. 9 in. ; intrados radii, 127 ft. The whole of these arches throughout the length of the bridge shall measure between their exterior faces, in the width of the bridge, a uniform width of 47 ft.

Piers.—At their springings the thickness of the two central piers shall be 19 ft., and of the two outer piers, 18 ft. The upper surface of the bridge shall, between the parapets, be divided into a carriageway 26 ft. wide, and two footways each 9 ft. wide. The summit level of the bridge roadway midway over the central arch shall, when completed, be 38 ft. 6 in. above Ordnance datum, from whence uniform gradients of 1 in 45 shall incline north and south to points upon the bridge, midway in the 112 ft. spans.

High-street, Putney, and Windsor-street Approaches : Gradients.—The main Putney approach-road to the bridge shall have a uniform gradient of 1 in 35 from the point midway in the Surrey arch aforesaid, terminating at a point in High-street, Putney, about 204 ft. distant from the river face of the Surrey abutment.

Mantegna's Altar-piece of St. Zeno at Verona.—In an article headed "Mantegna at the Museum of Tours," the *Times* of October 21st, says the Museum of Tours, saving that it possesses one treasure of the first order, would, perhaps, be most serviceable as suggesting what is to be avoided in forming an artistic collection. No more than one swallow makes summer does one masterpiece in the midst of a mass of hopeless mediocrity constitute a museum. The one attraction of the museum, and which draws so many lovers of art to make a pilgrimage to the fine old capital of Touraine, is the portion of the predella of Mantegna's altar-piece of St. Zeno at Verona, one panel,—the Crucifixion,—being in the Louvre, the remaining two,—the Agony in the Garden and the Resurrection,—unfortunately separated from their companion picture, being at Tours. How they came there was this : when the altar-piece was sent to Paris by Buonaparte, the smaller panels of the predella were removed,—one was retained at the Louvre, and two were sent to Tours, in 1806. The formation of provincial museums had then been recently undertaken in France, and distributions of pictures, of what was considered of inferior interest, were made in 1803 and 1806. At the overthrow of the Imperial power the three larger panels were restored to the Church of St. Zeno, but, through the ignorance or neglect of the Italian Commissioners, the predella was left behind.

The Earnings of Building-Trade Operatives.—Mr. George Potter contributes another letter to controversy, already noticed by us (p. 517, *ante*), as to the poverty of the working classes. In the course of it he says,—"The London working men are divided into many trades, and they vary greatly both in regard to wages, condition, and habits. The building trade is one of the largest and most important. It comprises masons, bricklayers, carpenters, joiners, plasterers, painters, slaters, and plumbers. These men are not employed regularly. Frosty and wet weather stops the masons, the bricklayers, the carpenters, and the slaters, while the painters' work is mostly confined to the summer and autumn months. Considerable loss of time is therefore experienced by many of these workmen during the year. At the present time the wage of the operatives in the building trades is 9d. per hour, they working fifty-one hours a week, which amounts to 1*l.* 18s. 3d. It must, however, be remembered that the men are not paid for loss of time in bad weather or when out of work owing to slackness of trade. I should say from experience and careful observation that a very large number of workmen employed in the building trades are out of work ten or twelve weeks in the year. This will reduce their average wages to about 30s. per week."

The Prevention of Waste.—This was the subject of an interesting lecture given by Dr. Siemens, president of the British Association, to the students of the Coventry Science Classes on the 20th. Speaking of the waste of mechanical energy, he said that twenty years ago 10 lb. of coal was consumed for every horse-power of effect yielded, which had been by scientific method and mechanical skill reduced to 2 lb. In like manner, in smelting works the amount of coal required to produce a ton of iron had been reduced from seven or eight tons to a fifth of the quantity, whilst a ton of steel was produced with three tons instead of fourteen. Those were instances showing how much waste could be prevented by the proper direction of working machinery, and the development of processes. At the bottom of it there must always be science. No improvement that was not the outcome of first scientific principles could be trusted. If an improvement was merely the result of rule of thumb or rough observation of the working of machines and their effects, it generally led to very partial and doubtful results, applicable only to one particular instance, whereas it was always by the application and thorough comprehension of those first principles in science that the revolutionary inventions of modern times had been brought about. The point to which science and the arts should be directed chiefly, was the prevention of waste, and in doing so they would vastly increase not only the national resources, but individual well-being. An old proverb, "Waste not, want not," had been in our mouths for hundreds of years, but only now were we beginning to realise it scientifically.

Bakehouses in Bethnal-Green.—Dr. Bate, Medical Officer of Health for Bethnal-green, has issued a report giving the result of a thorough inspection of the whole of the bakehouses in that parish, 112 in number. There are 41 bakers who carry on their business in underground cellars. The walls and roofs required lime-washing in 58, and the troughs and utensils were unclean in 22. In 57 instances he found refuse flour swept under the troughs, the refuse being, he says, usually sold for feeding pigs. There were 35 bakehouses badly ventilated and 41 badly lighted. In 14 cases the sink-traps in the bakehouses were defective and the bell-traps were little better than none at all. The traps in the yards next the bakehouses were also defective in 32 instances; in 12 the water-closets were badly placed, but in only one was the closet actually within the bakehouse, though in another case it was in the flour-loft; and the closets were either foul, dilapidated, or ill-ventilated in 61 cases. Dr. Bate is decidedly of opinion that the condition of the bakehouses in Bethnal-green is worse than when he last visited them in 1878. The Bakehouse Regulation Act of 1863 ought never to have been repealed. It should have been amended, and the registration of all bakehouses made compulsory, power being given to the vestries to refuse to register unfit premises.

Completion of the South Shields Corporation Tramways.—Mr. James Gowans, contractor, of Edinburgh, commenced the work of laying down the above tramway at the Pier Promenade, on Monday, July 24th, and finished it at Tyne Docks on Saturday, October 21st, this being the exact time allowed for in his contract, viz., twelve weeks. The length of the tramways laid down, taken as a single line, is three miles and a half. The gauge is 3 ft. 6 in., and the system is that known as "Gowans's." The works have been carried out under the direction of Mr. Matthew Hall, borough engineer.

Vienna.—According to the *Neue Freie Presse* the magistracy of Vienna have, after an exhaustive discussion during three meetings, at which the project of Ob. Ing. Berger, chief of the Stadtbauamt, found general approbation, unanimously decided for the arching in of the Wienfluss in connexion with a Stadtbahn, and for the execution of the project within three years, and recommends the Gemeinderath also to accept the scheme. Berger calculates to obtain from the sale of the ground reclaimed by the execution of the project a surplus of three million florins, after defraying all expenses.

The Boulak Museum.—M. Maspero, the well-known Egyptologist and Curator of the Boulak Museum, returned to Cairo on the 6th of October. He has made an examination of the contents of the museum, and it is satisfactory to learn from the *Times* that he finds everything absolutely as it was left by him.

TENDERS

For the completion of "Homeward," Auckland-road, Upper Norwood, for Mrs. Forbes Watson. Mr. C. J. C. Pawley, architect, 26, Moorgate-street. Quantities by Mr. C. L. Cadney, York Buildings, Adelphi :—

W. Henley	£2,862	0	0
J. & C. Bowyer	2,542	0	0
J. Stuart Hollidge (too late)	2,297	0	0
J. Holloway	2,270	0	0
B. E. Nightingale	2,253	0	0
Turtle & Appleton	2,250	0	0
T. Smith & Sons	2,197	0	0
J. O. Richardson (accepted)	2,141	0	0

For the Marlowe-road drainage :—

W. Crockett, St. Pancras	£603	10	0
A. Steer, South Norwood	599	2	6
T. Taylor & Co., Pimlico	561	17	0
T. Mowlem & Co., Westminster	470	4	6
H. S. Pollard, Bow	469	5	0
W. Carter, Anerley	460	9	6
T. E. Baxter, Fulham	456	11	1
W. & J. Woodham, Sydenham	444	0	0
Davis & Attwood, Bromley	431	9	11
T. Bell, Wood-green	425	2	6
J. Bentley, Chiselhurst	422	10	0
E. & W. Iles, South Wimbledon	414	3	10
J. Dooley, Tottenham	400	5	0
Bottoms Brothers, Battersea	383	0	0
G. B. Marshall, Brighton	381	6	8
T. Taylor, Beckenham	366	0	0

For relief offices for the Guardians of the Poor, Lewisham. Mr. H. Bonner, architect :—

Holloway	£1,083	0	0
Banks	1,053	0	0
Teggar	1,046	0	0
Selby	1,034	0	0
Birch	1,025	0	0
Jerrord	983	0	0
Higgs	925	0	0
Stewart	897	0	0
Stayner	895	0	0
Cawson & Son (accepted)	890	0	0

For the erection of a manager's house at Gomshall, Surrey, for Messrs. Gilligan & Son. Mr. W. Ravenscroft, Reading, architect. Quantities supplied by Messrs. Cooper & Sons, surveyors, Maidenhead and Reading :—

J. H. Margetts, Reading (accepted)	£519	0	0

For alterations and additions to No. 84, Broad-street, Reading, for Mr. Joseph Noad. Mr. W. Ravenscroft, architect :—

J. Bottrill, Reading (accepted)	£200	0	0

For house at Enfield, for Mr. W. H. Fairbairn. Mr. J. T. Bressey, architect, 70 and 71, Bishopsgate-street :—

Eastbrook, Dalston	£1,765	0	0
North Brothers, Stratford	1,650	0	0

For general repairs of seven houses, Commercial-road, Peckham. Mr. Shelton Reilly, architect :—

Cawley	£335	16	0
Shrives	269	0	0
H. R. Ockenden	247	0	0
J. P. Kiely	245	0	0

For proposed new road on the Brook House Estate, Brentford, for Mr. Stephen Walker. Messrs. Smithies & Gladman, surveyors :—

H. Spicer, Brentford	£350	0	0

For sewerage works at Hoylake and West Kirby, for the Wirral Rural Sanitary Authority :—

W. Wilson, New Brighton	£895	12	6
J. Hall, Liverpool	891	7	0
T. Hamond, Rhyl	851	9	2
E. Taylor, Hoylake	746	6	6
J. Nuttall, Manchester	677	5	2
W. Winnard, Wigan	663	9	0
Fawkes Brothers, Birkdale	635	18	9
W. Thomas, New Ferry	603	3	1
J. Taylor, Widnes	580	0	0
T. & J. Harrison, West Kirby	475	0	0
Holme & King, Liverpool (accepted)	466	10	0

For the erection of new shop and dwelling-house, St. Botolph's-street, Colchester. Mr. J. F. Goodey, architect :—

J. Ward	£1,390	0	0
H. Everitt & Son	1,384	0	0
Saunders & Son, Dedham	1,334	0	0
Eade	1,280	0	0
G. Dobson	1,239	0	0
C. H. Oldridge	1,213	0	0
F. Dupont	1,195	0	0
A. Chambers (accepted)	1,143	0	0

For alterations and additions to the Grange, East Haybourne, Didcot, for Mr. Pilcher. Mr. James H. Money, architect. Quantities supplied by Messrs. R. L. Curtis & Sons :—

E. Pether (accepted)	£450	0	0

For a group of three superior cottages with shops, for Mr. Pilcher, at East Haybourne, Didcot :—

E. Pether	£650	0	0

For the erection of a village hall for the Loughton Lopping Trust, Essex. Mr. Edmond Egan, architect, Loughton. Quantities by the architect :—

J. Ashpital, Loughton	£3,359	0	0
W. J. Cuthbert, Loughton	3,038	3	6
J. Bentley, Waltham Abbey	2,974	0	0
H. Wells, Woodford	2,882	0	0
W. E. Cook, Loughton	2,855	0	0
J. Egan, Buckhurst Hill (accepted)	2,736	16	0

Accepted for new kitchen offices, additions, and alterations, and new system of drainage to two villas, Bonniefield, Southside-road, Inverness, for Miss Helen Gellion. Mr. A. R. Henderson, architect :—

T. Macdonald, Dirleton-place (mason).
A. Anderson (carpenter, plasterer, painter, and glazier).
A. Matheson (slater).
A. Thomson & Sons (plumbers).

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For repairs to Goldsmiths' and Jewellers' Almshouses, Manor-road, Hackney. Mr. W. P. Griffith, architect:—

Cubitt	£120	0	0
Martin	114	0	0
Dearing	113	15	0
Grover	108	10	0

For drainage works and outfall, Broadstairs. Mr. R. J. H. Saunders, engineer, 27, Wallbrook, London:—

Pollard, London	£15,348	0	0
Kellett & Bentley, London	15,187	1	1
Rigby, Croydon	14,646	0	0
Marshall, Brighton	14,572	5	0
Nicholson, London	13,752	18	9
Mowlem, London	13,735	4	9
Paramor & Son, Margate	13,223	0	0
Beadle Brothers, London	13,361	6	11
Iles, Wimbledon	11,827	7	10
Horne, Ramsgate	11,559	0	10
Matthews, Dover	10,234	18	1
Denne, Walmer	9,819	9	0

For additions to the National Schools, West-street, Ewell, Surrey, for the Rev. Sir. George L. Glyn. Mr. Herbert D. Appleton, 264, Wool Exchange, architect. Quantities by Mr. F. T. W. Miller, of Guildhall-chambers:—

J. W. Hobbs	£1,298	0	0
Birch, Tompsett, & Kingham	1,280	0	0
W. Crockett	1,255	0	0
Priestly & Gurney	1,250	0	0
W. Mudie	1,248	0	0
Jones & Co.	1,240	0	0
Le Gassick & Co.	1,175	0	0
W. J. Beale	1,172	0	0
R. Ward	1,145	0	0
J. B. Potter	1,135	0	0
P. Peters	1,130	0	0
Deacon & Co.	1,120	0	0
W. Shurmur	1,098	0	0
J. Holloway	1,095	0	0
J. Longley	1,085	0	0
W. Pearson	1,085	0	0
Loe & Sons	1,065	0	0
Dawson & Son	1,035	0	0
F. Higgs	1,018	0	0
G. Hards	999	0	0
W. C. Hards, Ewell, Surrey	993	0	0

For the erection of two houses at Lower Norwood Messrs. Ernest George & Peto, architects. Quantities by Messrs. Stoner & Son:—

Steddar	£2,595	0	0
Bugg	2,530	0	0
Bower	2,499	0	0
Mason	2,447	0	0
Perkins	2,432	0	0
Nash	2,400	0	0
Eyears & Sampson (accepted)	2,397	0	0

For a group of six water-closets for ladies at the Abbey Park, Leicester. Mr. J. Gordon, borough surveyor:—

J. Hutchinson & Son, Leicester	£165	0	0
T. Duxbury & Son, Leicester	152	0	0
J. O. Jewsbury, Leicester (accepted)	131	0	0
Nicholas Elliott, Leicester	130	0	0

For one double set of earth closets for ladies, and one double set of earth closets, with urinals, for gentlemen, at the Cemetery, Leicester. Mr. J. Gordon, borough surveyor:—

J. Hutchinson & Son, Leicester	£240	0	0
T. Duxbury & Son, Leicester	225	0	0
Nicholas Elliott, Leicester	191	10	0
J. O. Jewsbury, Leicester (accepted)	189	0	0

For five houses in the Coolfinn-road, Victoria Docks, for the Rev. J. Roe. Mr. E. P. Loftus Brock, architect:—

Mattock	£1,877	0	0
Brass	1,680	0	0
Perry	1,250	0	0
Reed	1,215	0	0
Brown & Roberts	1,176	0	0

For erecting a detached villa, Shepherd's Hill-road, Highgate, for Mr. H. Kenneth. Mr. E. J. Paine, of 11, Great James-street, Bedford-row, architect:—
J. S. King (accepted).

For the rebuilding a mansion called Beaulieu, at or near St. Leonards, for Captain W. Hankey. Mr. A. J. Pilkington, architect, 35, Essex-street, Strand. Quantities by Mr. Pether:—

William Brass	£9,983	0	0
Dove Brothers	9,975	0	0
Patman & Fotheringham	9,573	0	0
T. Rider & Son	9,488	0	0

For alterations and additions to the North Hallsville Schools, Canning Town, for the West Ham School Board. Mr. J. T. Newman, 2, Fen-court, Fenchurch-street, architect. Quantities supplied by Messrs. R. L. Curtis & Sons:—

T. M. Miller	£2,700	0	0
T. Higgs	2,380	0	0
D. C. Jones & Co.	2,340	0	0
Taylor & Grist	2,338	0	0
J. Morter	2,273	0	0
H. R. Swain	2,234	0	0
W. E. Lynde	2,220	0	0
W. Gregar	2,180	0	0
C. Cox	2,174	0	0
North Brothers	2,150	0	0
A. Reed	2,147	0	0
B. E. Nightingale	2,117	0	0
M. Gentry	2,070	0	0
Hearle & Son (accepted)	2,012	0	0

For alterations and additions to house, Victoria Dock-road. Mr. J. Boreham, architect:—

G. Gregar	£665	0	0
J. Sawyer	542	0	0
J. Morter	527	0	0
W. Shurmur	522	0	0
J. Johnson	489	0	0
W. Roberts	442	0	0

For the erection of a Weslevan chapel at Arkingarthdale, Richmond, North Yorkshire. Messrs. Leeming & Leeming, architects. Quantities supplied:—

Mason's Work.
J. Smith, Arkindale (at per schedule).
Carpenter and Joiner's Work.

Thomas Suley, Halifax	£603	0	0

Plumber, Glazier, and Heating Apparatus.

John Naylor, Halifax	120	0	0

Painter's Work.

Jonas Binns, King Cross, Halifax	75	0	0

Plasterer's Work.

John Binns, Castleford	34	8	0

Slater's Work (unlet).

TO CORRESPONDENTS.

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The Builder.

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*Ionian Antiquities.**

THE publication by the Society of Dilettanti of the Fourth Part of the Antiquities of Ionia is not likely to be the conclusion of the distinguished services which this private association of amateurs has rendered to the arts since its institution in 1743; but it may be regarded as the completion of one section of the work which it set itself by a standing expression of regard for antique ideals,—for "Grecian taste and Roman spirit." Certainly there has been something of Roman pertinacity in the steadiness with which, through all the variations of national fashion and taste, the principle which the Society originated has been kept in view and acted on, that opportunities were to be made the most of, while it was yet time, to seek out and rescue illustrations of the arts of Greece from the very soil of Greece itself. The results are seen in the publications which they assisted and promoted, from those of Stuart & Revett to Mr. Cockerell's splendid work on the "Architecture of Ægina and Bassæ," as well as those which were more exclusively their own; Mr. Penrose's palmary work on the Parthenon, "an acquisition for all time," and the successive volumes of the "Unedited Antiquities of Attica" and the several parts of the "Antiquities of Ionia," which in the part now before us in some degree by corrections of what went before, and no less importantly by additions of the highest interest, combines at last into a completed work,—a thesaurus of all the aids and materials for the study of Ionic architecture, especially throughout the period of its greatest perfection. It may, indeed, be said that this last part is by far the most valuable of the four, but it will be well that either in the architect's office or his library the series should range together.

The monuments illustrated in thirty elaborate and beautiful engravings and eighteen woodcuts are three Ionic temples of Asia Minor,—that of Athene Polias, at Priene; of Dionysus, at Teos; and of Apollo Smintheus, in the Troad. The authentic materials for these representations of works of ancient architectural genius were obtained by excavations conducted through a course of several years by Mr. Popplewell Pullan, at the expense of the Society. The temple of Apollo Smintheus had never been examined before; the other two had been explored, so far as was possible without the means of moving the vast masses of the confused ruins, and only with the effect of suggesting the more thorough examination which has been so fully justified. It is not too much to say that by the certified restoration of the temple of Priene, as exhibited in the admirably engraved perspective view which is the frontispiece of the work, there is recovered for the world the design of a building which is entitled to range with the limited series that are in the very first line for elevation, dignity, and grace.

Besides Mr. Pullan's reports on the circumstances of the excavations, the letter-press by members of the society comprises an introduction by Mr. Fergusson, on the origin of the Grecian orders of architecture, and notes on the architectural fragments and sculptures which were presented by the society to the British Museum. Interesting notes on the sculptures recovered, which have found the same appropriate home, are by Mr. C. T. Newton, who also summarises what is known of the history of the various sites, and interprets the significance of coins and inscriptions. The contribution of Mr. Watkiss Lloyd is a memoir "on the proportions of the Ionic temples of Priene, Teos and the Smintheum," which we apprehend may best be studied in combination with his appendix to the Bassæ and Ægina of Mr. Cockerell. Mr. Penrose brings to bear on the problem of the exact height of the Priene column, the power of analysis which stood him in such good stead in his study of the work of Ictinus on the Athenian acropolis. Uncertainty as to this dimension,—so important an element in the expressive proportions of the order,—seems to have been a main and not insufficient motive for the renewed and complete examination of the ruin. It will be seen that in the engraving of a former volume no dimension is inserted, and a height was assigned by conjecture, and that to all appearance not a happy one. Yet the views of the ruins appeared to indicate that they lay much as they had been cast at some unknown date by one of those earthquakes which we know to have occasionally brought ruin upon entire cities in Asia Minor. More difficulty, however, was encountered than had been expected. The ruins were found to be jumbled in an extraordinary manner, and not to have remained through the ages by any means unmeddled with. It thus appeared that all the slabs of the frieze which there can be no doubt were sculptured, were missing, and the drums of the columns, numerous as they were, lay out of all order amidst and about the mound, and in no case could be taken up with any confidence that juxtaposition on the ground agreed with original sequence as erected. In such case there was nothing for it but to secure accurate measurements of all the frusta remaining,—their heights and upper and lower diameters,—in the hope, which was justified by result, that they would give up to study at home what it was hopeless to attempt to recover from them as if proffered to measurement spontaneously on the ground. To those who appreciate as a treat and a luxury what so many approach only with self-distrust and under compulsion, the elucidation of a problem by the resources of mathematical ingenuity, we commend Mr. Penrose's appendix. It will be obvious how the interference of the element of entasis frustrated any deduction from the comparison of upper and lower diameters of the column and a uniform intermediate rate of diminution as discoverable from the better preserved frustra. The key of the question was, in fact, the independent determination of the special entasis. A height for the shaft was in this manner ultimately obtained and was further certified by coincidence with a proportion of diameters to height which is favoured by authorities, and still more importantly by beauty of effect. A restoration of the temple was attempted by Messrs. Olivier Rayet and Albert Thomas, in their learned work, "Milet et le Golfe Latmique," of which the second *livraison* appeared in 1880. They had the advantage of working upon the ruins as uncovered by the Dilettanti Society, but were content to adhere to the stunted height of the column, which has already been found unsatisfactory as adopted in an earlier part of the "Antiquities of Ionia." The comparison of the elevation as they give it with that which is presented on the authority of Mr. Penrose's conclusions will probably leave doubt with few as to which we may adopt with full confidence of having the Greek architect on our side.

The temples of Priene and Teos are both hexastyle, and differ very little in dimensions, their breadths approaching as nearly as 69·60 and 72·33. Again, the free intercolumn at Priene is given as 5·810, and the corresponding interval at Teos is 5·950, but the greater diameter of the Priene column gives a relatively closer spacing, and with the superiority given by its majestic height it realises a dignity of effect which distances all comparison. The uniformity which is sometimes imputed to Greek temples is due, in fact, to the defective sensibility of the same nature as that which Dr. Johnson exemplified when he said, "He who has seen one green field has seen all green fields." Agreement in broad distinctions obscures, to a novice, those all important differences which render it incomprehensible to others how one racehorse can be mistaken for another, one musical air for another, or how a new acquaintance blunders between different members of a family; nay, how a traveller can be so unobservant as to think all Chinamen alike. Temple resembles temple as the physiognomy of one brother corresponds with that of another,—resembles it so, and not otherwise, that is, reserve being

* Part IV., published by the Society of Dilettanti.

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made of very sufficient indications to the eyes of familiars of most contrasted temper and disposition.

The free intercolumn of the Smintheum is again as near to the average of the others as 5·895, but differenced in this case by less open spacing than at Teos, the lower diameter of the column being 3·870 to compare with 3·380, and less close than at Priene. This temple is octastyle, and might be called pseudo-dipteral, but that it does not seek an advantage by putting forward a false pretence. The ambulatory is spaced of width sufficient to admit of a double row of columns all round, but no such second row was introduced, as usually in the pseudo-dipteral arrangement, even on the fronts. In this temple, therefore, we have a unique example of an ambulatory that was too broad to be spanned by marble beams, and must have been roofed throughout by aid of timber.

The Priene temple was raised on only two steps below the proper stylobate,—that at Teos had five, while the Smintheum was raised 10 ft. all round above the general platform by ranges of ten steps. The capitals of the columns of all three have differences of refinement and character dependent on delicate modifications of the same elementary members, and all are destitute of the enriched necking of the Erechtheum columns; but the bases have remarkable differences. The Teos column has a proper Attic base only set on a plinth, which the Athenian architects disallowed. The bases of the Smintheum are without a plinth, but vary from the Attic by the interpolation of a second scotia between the upper and lower torus. In general structure the base of Priene may be said to agree with this, except for the omission of the lower torus. It is probable, however, that Priene presents us with the more original type of base of the Ionic of Asia Minor, and that the addition of a lower torus was a later innovation. This later type assuredly commends itself preferably to our sympathies, though there can be no question that the Priene temple is, on the whole, and in general study and execution of details, the far superior work. The value or the objectionableness of this form of base may be studied by observation of Mr. Cockerell's reproduction of it in the portico of the church in Regent-street. We trace in it an endeavour to endow with gracefulness an original type, of which a cruder form has been preserved in the archaic base of the Samian temple. The date of the design of the temple at Priene, which may have preceded by some decades the completion, may probably fall within the half-century following 360 B.C., as the dedication of it by Alexander the Great is recorded in a beautifully-executed inscription, which may be seen on the original marble in the British Museum. The dates of the other temples are uncertain, but quite as likely to be earlier than later. Any attempt, therefore, would be frustrated to link them in a sequence of regular evolution of style. The Priene base may be as easily a survival as an intentional revival of an archaic type which had been variously modified, and taken different directions of development in various sites and among the numberless monuments of imprortance that have perished. From this point of view we may, perhaps, fairly speculate as to the course of the development, without attempting to localise the introduction of each successive change, or to make any inference beyond general order of succession. Tentatively, then, we may assume two primary centres of development, a Western and an Eastern, for the composition of the mouldings which are in question. For the West we claim the primary type of a scotia interposed between an upper and lower torus of varied proportion, as already adapted for the capital of the pillar of the Lion Gate of Mycenæ long before some man of genius discerned that the combination was more fitted for a base. In the East we may start from the base of the Samian column, a torus grooved with horizontal channels, and superposed upon what may be called a very high but very shallow scotia, which likewise receives horizontal channels in its hollow, as the torus on its swelling profile. To this the Priene base, late as it is historically, comes next in order. The channelled torus, here as at Samos, is united to the apophyge of the shaft by an annulet, but the sub-base is now made available for more decided contrast; the numerous channels are superseded by a pair of bolder scotias, divided and bounded by double annulets, and resting on a plain square plinth. The refinement of the profile of this base may be appreciated in the enlarged outline given at plate xi. of the work before us. And yet it may be doubted whether it is truly an artistic improvement upon even the Samian type. Enhanced hollows separated by slender projections introduce a weakening and frittered effect precisely where there is demanded an expression of adequately responsible solidity. The Athenian architect knew how to avail himself of all the suggestions of enrichment and embellishment which such designs afforded, and yet to preserve unimpaired all the suggestions of structural propriety. In all the bases of the Ionic columns of the Erechtheum, the annulet below the apophyge is suppressed,—it is admitted in the little temple of Nike Apteros,—and in all we have the true Attic type of the paired torus with a bold intermediate scotia. On the eastern and western fronts the upper torus is grooved with horizontal channels divided by narrow fillets; on the eastern base by a further variation it is embraced by a plaited guilloche. The lower torus is in every case left plain. This, however, is not the case with the bases of the antæ, and its extension along the wall of the so-called caryatid portico,—the "Stoa of the Maidens" of the inscription. The lower torus in these cases contrasts with the upper by convex in place of concave treatment, by exhibiting annulets in section instead of channels. In the less ornate order of the beautiful little Ionic temple on the Ilyssus, we have the plain Attic base which is adopted at Teos, where, however, it is set upon the square plinth. At the Smintheum the architect approached so far to Attic practice as to substitute a torus for the omitted plinth, while he favoured that of his own side of the Ægean, so far as to adopt, though in simplified form, the double scotia, and, it must be said, almost forfeits, in consequence, all the advantage of his judicious innovations.

This temple, there can be no doubt, was the successor, and probably occupied the site of that which was served by Chryses,—that is, by the priests he poetically represented,—who, in the first book of the "Iliad," calls down the vengeance of his god,—whom he appeals to as Smintheus,—upon the sacrilegious Greeks who have robbed him of his daughter. It is quite true that Homer settles Chryses and his temple much nearer to the seashore; it served his manifest convenience to do so, and students of Homer did not need even the excavations of Dr. Schliemann, or the geognostical survey of the Troad by Professor Virschow, to be aware how elastic was the poet's conscientiousness with respect to space or to time either when a poetic purpose was to be attended to at any sacrifice. We ourselves seem to have wandered away in a digression from a general consideration of the book which supplies our theme. Let us, to find our way back, take ship with Ulysses and his chorus of young men on their return to the camp after appeasing the angry divinity by reparation at the Smintheum :—

"So soon as the daughter of dawn appear'd rose-finger'd Eos,
Immediately launching were they to return to the camp of Achaians;
And the Far-darter Apollo sent forward a gale in their favour,
And they stepp'd the mast and the white sails above expanded,
And full fairly blew the wind in the sail; and the wave on both sides,
Purple about the gunnel, made loud sound, the vessel going;
And she ran to meet the waves, so speeding on her passage;
And when they had reach'd the spacious camp of the Achaians,
On to the mainland did they haul the sable vessel,
Up on the sands very high, and extended the long props beneath her,
And went themselves dispersing about the tents and the navy."

(A literal and lineal translation.)

The introduction, by Mr. Fergusson, treats in detail of the origin of the Doric and Ionian orders, and with his well-known perspicacity and vigour he traces the obligations of each, to Egypt on the one hand, and to Assyria on the other, the fine skill with which the Greek developed from foreign materials and concurrently two styles of distinctly-marked characteristics which yet were participant in certain leading principles that stamped them as cognate and truly national, and made them equally available for sacred national architecture. It was from the dignified architecture of Egypt that the Greek learned the value of extended colonnades and a rectangular plan, of the enhanced verticality of the fluted column. It was even from Egypt that the Greek ultimately took the hint for the relief of the hard outlines of lithic construction by embellishments founded upon floral forms and luxuriant vegetation. But whatever the Greek borrowed he thoroughly assimilated; he made it thereafter far more Greek than barbarian, and this he did partly by direct transformation, and partly by subtle elaboration. So it was that he superinduced upon his Egyptian borrowings the refinements of entasis of the shaft and geometrical development of the flutings, and in appropriating the Oriental entablature of which Mr. Fergusson engraves an example, while he retained for his Ionic order the triple fascia of the architrave, he either suppressed the expression of rafter ends above it entirely, as in the Attic examples, or moved them up a stage, reduced to an ornamental modillion course above the sculptured frieze. In the representations of archaic Doric architecture on the vases, we see that it retains the erect cornice of the Egyptian pylons, but in the very earliest monumental remains this position and profile, appropriate for a rainless climate, is corrected, and the cornice, turned forward to a right-angle, becomes a proper drip-moulding and protection for the face of the wall. In one particular, and for once, we hesitate to follow our so learned and so experienced guide; Mr. Fergusson, after pointing out the taste and skill with which the Ionic Greeks adopted the general proportions and modified the voluted capitals of such columns as those of Persepolis, has the further remark,—"The Greeks never, unfortunately, adopted the Persepolitan bell-shaped base, which is one of the most pleasing features of the style; perhaps they thought it too lofty, being about one diameter in height." Such a motive would in itself assuredly be sound as affecting an architectural member of which recumbency and not erectness is the appropriate expression, but we believe there was a sounder motive still. If we follow the practice of the Greek architects of the best ages, we shall find that in their base mouldings they uniformly avoided a profile which conveys the impression of the pressure of shaft or pedestal being carried down to rest upon an edge at its last attenuation. If the Greek had made use of the Persepolitan base at all, it would have been to turn it upside down and employ it as a capital, in which position the taper leaflets which clothe it would, moreover, be reminiscent of the natural direction of growth. Indeed, the capital of the Tower of the Winds at Athens exhibits the precise equivalent of such a transposition. The Roman architects, or it may be the Greek architects, in degraded Roman times changed all this. When their more noble predecessors made a change from an established precedent, it went often to the extent of an entire reversal, but ever with the direct motive and result of superseding an incongruity and substituting an expression of consistency and truth. Less gifted practitioners in those days, as it has happened not unfrequently later, resorted to random reversal of traditional models as the method of compassing stimulant novelty, as a modern critic in desperation of an original idea betakes himself to paradox, denounces the drawing of Raffaelle or the dramatic instinct of Shakspeare, as the barren of conversational power can always find something to say by a flat contradiction of any one who unguardedly ministers an occasion to them. There is no more certain conviction of an architectural profile as of the lowered style,—or, let us say, practice,—of the Roman as contrasted with the pure Greek period, than the termination of a base moulding by a concave instead of a convex profile; the final curvature of the Greek is either that of the independent torus or of a similar profile blending continuously with a scotia more or less pronounced above it, or the somewhat less decided *cyma reversa*.

It is in the greater variety, more complex combination of mouldings and the liberal admission of profiles of double curvature, that the Ionic style contrasts with the austerer Doric, rather than in an advance in refinement upon those which the Doric employed. The editors of this volume merit gratitude for the number of plates that they have devoted to large-sized profiles of mouldings which were accurately taken by the assistance of the cymagraph. They are all of great delicacy and elegance, and not least those which belonged to bases and cornices of merely secondary pedestals within and about the temple. The importance of reproducing these graceful details upon a sufficient scale may be appreciated by com-

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paring the plates before us with the small representations of the same mouldings,—that is, of a few of them, which appear in the reductions of Messrs. Rayet & Thomas. A note of Mr. Fergusson reflects on these gentlemen, not perhaps, unnaturally, as having "shown haste to anticipate the publication by the Dilettanti Society of the results of the excavations made at their expense at Priene"; they may plead on their part that allowance must be made for zeal, even though it be zeal which outruns discretion. But the truth is that when elegance, accuracy, completeness, and finish are in question there has been no anticipation whatever of what constitute the distinctions of the beautiful work which it is our pleasure to commend to an appreciative reception by the profession. There is yet one more service which the profession may not unnaturally look for at the hands of a society to which it already owes so much; but the suggestion of this will be most appropriately conveyed in the first instance direct to the Society of Dilettanti itself.

THE ART OF THE ARABS.*

We may continue our glance at the art of the Arabs, with a notice of their domestic architecture and the industrial arts of the people who have occupied the land of the Pharaohs for the last 1,200 years, and who have left so deep a mark on the Egypt of to-day.

The history of Egypt is a long series of constant invasions, conquest, and revolutions. Cairo, as the capital, has naturally suffered severely in these changes; the city, however, still retains, in addition to many of its ancient mosques, some few admirable specimens of the domestic architecture of its past and brilliant days. Ravaged as Cairo has so often been, no uninjured relic of the former homes of the caliphs and sultans has been handed down to our time, except the gate of the palace of Sultan Beybar and a few interesting remains of private dwellings, amply sufficient, however, to show that the splendour displayed by the Arabs was not confined to the decoration of their mosques. The endeavour at improvement, and the scarcely less destructive influence of fashion, have in many cases aided the work of war, and swept away many of the relics of the past, substituting for them the incongruities of European taste and Turkish vulgarity, but there fortunately exist in Cairo some few houses which retain the character, now as lamentably deficient in the modern buildings of the East as in those of the West.

The old houses of Cairo are invariably solidly built, the ground-floor of stone, the upper stories of brick. In plan, every means were adopted to ensure that entire secrecy of private life which constitutes so essentially the character of the Egyptian Mahometan; and exteriorly, as we have previously remarked, the utmost simplicity was aimed at, with a view to discouraging possible attack from marauders, or from exciting in any way the cupidity of a too exacting royalty. The entrance to the house is in many cases a marvel of military architecture, with massive doors and intricate vestibule. Above the gate of the house of the Sultan Beybar, one of the few remaining relics of the past domestic architecture, can still be seen a frowning machicolated *moucharabyeh*. Once, however, the interior is reached, the scene changes. The *salamlik*, or *mandarah*, the reception-rooms, are as lavishly decorated as the exterior is grim. Tiles, fountains, divans, rich hangings, and gildings meet the eye in every direction; the walls opposite the door agreeably covered with a series of architecturally-treated shelves, on which are arranged various vases and utensils, rare china, and other *bric-à-brac*. From top to bottom the other walls are covered with tiles, usually Persian; the windows filled with delicate grating of bronze work, the woodwork intricately carved and inlaid, the ceilings ablaze with arabesques and gold, contrasting delicately with the rich blue of the tiles. Of furniture little or none, the divan supplying all needs. Not the least important feature, as taking a conspicuous part in the decorations of the room, deserves mention the *moucharabyeh*,† or projecting covered balcony, a sort of oriel window (suggested, perhaps, by its Egyptian counterpart) completely caged in by delicate lattice-work. A further element of the interior decoration deserves mention, the windows,—usually about 2ft. broad and 3 ft. high,—filled with stained glass of conventional design. The large rooms are generally very high, in order to ensure coolness, and ventilation is obtained by large open garret windows, constructed so as to catch the breezes, and send a draught through the house. The ceilings of the room are in every case of richly-decorated woodwork, the rafters painted; below the ceiling stretches a long frieze, generally containing a verse from the Koran.

Decorated in this manner, the walls of a Mussulman's house are very different to those of our West. Amply supplied with quaintly-conceived, yet handy, cupboards and shelves, the wall-spaces richly covered with tiles or carving, and divans stretching along one whole side of the room, to serve in day-time as a sofa, at night as a bed, the only furniture necessary to move into such a place is a few carpets, a few cushions, a table, an inlaid piece of work suggesting more a stool than that sturdy article of furniture, a few odds and ends, and simple cooking-utensils. The bath, in the present day as in the past, takes a great place in the best houses, often supplied with two or three bath-rooms, each with a stove and retiring-room. As for the portion of the house reserved to the females, the strict privacy in this respect which the Mahometan religion enjoins, has from all time led to a very distinct separation of the women's quarters from those visited by the stranger.

As builders, the Arabs have never greatly excelled, they at all times have relied, as we have more than once repeated, on Christian assistance, which, originally afforded by the Byzantine workmen, is continued to this day by the Christian Copts. In our time Mehemet Ali employed Greek workmen as the most capable. Plans, such as we understand them, we have ample evidence, were unknown to the Arab architects of the past.* A general idea of the plan is given by tracing it on the ground with some dry plaster, but beyond this the whole scheme is carried out by the architect as the work progresses and in accordance with the requirements of his client.

The masonry is usually that known to the Greeks as *emplecton*, a facing of regular stonework, with a centre of rubble. The courses present alternately a square stone and a parallelogram. From a very early period the joggle-joint, so peculiar to Arab architecture, appears to have been used, apparently with a view to obtaining greater strength. In spite of the weakness of this mode of construction being soon recognised, and discharging arches having therefore to be used, the decorative character of the joggle over-ruled all other considerations. It will be sometimes found even imitated by incised lines on the marble lintel of a doorway, apparently out of that sheer fancy which seems so largely to have directed the Arab artists in their creations.

Some interest attaches to these experiments of the Arab architects from the fact that this may perhaps have led in a measure to the introduction of the ogive or pointed arch, first met with as an acknowledged architectural feature in the mosque of Touloun (ninth century). It is not our intention to enter here into the vexed question of the pointed arch. But in the above-named mosque the pointed arch will be found used as a leading motive. One interesting feature Prisse d'Avennes has drawn attention to. The Oriental pointed arch will be found to have its vertex formed of a keystone; this is rarely the case in the Gothic pointed arch, the vertex of which is formed by two voussoirs meeting directly in the centre. As tending to show that the Europeans may not perhaps have borrowed from the East the pointed arch, this detail is worthy of note.

As we have so far allowed ourselves to digress with the pointed arch, the dome forms a scarcely less characteristic feature of Arab architecture, and the peculiarities of the construction of which, in the hands of the Mussulman, have not uningeniously been explained by the suggestions of the observation of the vegetable forms of nature on which the Arabs were thrown from the restrictions of their religion. The German authority, Salzmann, has suggested the common water-melon as affording, in its horizontal section, the exact hemisphere of the Arab dome; the vertical section of the same fruit giving other forms to be met with in Arab art. The honeycomb pattern (further asserts Salzmann) was perhaps suggested by the interior of the melon cleared of its seeds.

As wood-workers, the Arabs have at all times excelled. Egypt, rich in rare marbles, has from antiquity been deficient in forests. This want of wood has, however, in no way hampered the inventive skill of the Arab wood-workers. Their intricate, incised, and inlaid patterns of ivory and mother-o'-pearl, their complicated joinery, necessitated by a dry climate, are only the more wonderful when it is seen how primitive are the tools and methods in use. In the mosques, the pulpit, and doors are invariably most complicated works, while in the interiors of the older houses no small portion of the lavish decoration are the creations of the carpenter and carver. In the *moucharabyehs*, so conspicuous a feature of the Arab house, all the skill of the wood-workers' art was displayed. A perfect cage of lattice-work, there will sometimes be as many as 1,200 separate pieces of delicately-turned woodwork in one square yard. This characteristic art is, however, now dead in Egypt. It still flourishes on the coast of the Red Sea, so Prisse d'Avennes tells us, but European influences are driving out the picturesque *moucharabyeh*. Fortunately, in the native quarter and older parts of Cairo, they will still remain for many a generation to come, to give their peculiarity to the City of the Caliphs.

As stucco-workers the Arabs have always excelled; wonderful, indeed, are their intricate arabesques, which we see carried to the wildest extreme in the Alhambra; there, however, let it not be forgotten the ornaments are almost in every case pressed out repetitions, while in the earlier and purer art such decorations are each the work of hand. The traditions of their art the Arab plaster-workers have retained almost to this day; the plasterers most in esteem in France coming from the southern provinces, where the Saracenic traditions have left deeply their trace. Intricate as may appear the arabesques used by the Mussulman artists, their composition is, as has been shown by more than one authority, purely geometrical, and when analysed will be found most simple. This simplicity especially marks the work of the earlier days; in the ornamentation of the purest period, the ground is usually coloured red, blue, or green, the projections remaining white, or when decorated, a line of yellow on a red, blue, or green ground. As to white and gold, they will chiefly be found in ceiling decoration. Analysis proves these colours to be, the blue, ultramarine; the green sometimes vertdegris, but most often ultramarine and yellow, of vegetable origin; the red, vermilion, or sulphuret of mercury. What skilful use the Arab artists made of these simple yet effective colours, all in any way familiar with Eastern art know well, but the most successful triumphs of their decorative talent are, it cannot too often be repeated, not to be found in the Alhambra, but scattered over Cairo and Bagdad in the few remaining early mosques of the purer period, in which will be seen in all its power the marked simplicity and breadth of decoration which forms one of the characteristic features of the best Arab art.

As an important element of effective decoration the Arabs have at all times largely employed mosaic,—an art, it can be understood, they acquired from the Byzantines; but here again their own peculiar originality soon marked out characteristic differences. The work known as *opus Alexandrinum*, such as still is to be found in the Mediæval churches of Italy and in our own Westminster Abbey, has at all times been largely used until very recent days in the mosques; the South Kensington Museum possessing a series of curious specimens of the work taken from a seventeenth-century Cairene mosque. In addition to the *opus Alexandrinum* used for floor work, the walls were decorated, as in Byzantine art, with mosaics of vitrified paste or *smalto*, less costly and more effective than

* See *ante*, pp. 202, 231, 297, 326, 389, 452, and 486.

† The word *moucharabyeh* is derived from *charaba*, to drink, it being the custom to place vases containing water to cool in the draught of the latticed window.

* Sir Geo. Birdwood, in a recent letter to the *Athenæum* (Sept. 23), has drawn attention to the fact that in India the native architects to this day use no plans, the morrow's work being usually discussed with the builder and the workmen at the close of each day's work. Certainly the evidence of an Arab writer of the twelfth century, Abdul Latif, may be brought forward to show the antiquity of this custom. "When a palace or other edifice has to be built," he writes, "the architect to whom the execution of the building has been confided is called in. He visits the spot, plans it out in his mind, according to the nature of the building required, after which he successively undertakes the different portions, and terminates them one after another, so that each may be used and occupied as it is completed."

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the mosaic of coloured marbles, a matter of no small consideration with the Arabs. As for tiles used for decorative purposes, they may be said to constitute one of the most important features of Arab architecture. Early found to possess, at a far less outlay of time and expense, all the effective qualities of mosaic work, tile work developed exceptional beauty in the hands of the Arabs and Persians. The oldest tiles, those of pure Arab style, decorated with Koufic characters,—for later on the Persians monopolised this branch of art,—are small (about 4 in. square), the ornaments in slight relief. They are of excessive rarity, their manufacture having ceased at an early period. Andalusia, in Spain, at one time, it would seem, produced large quantities of tiles. In the best period the decorations will be found to be large and grouped on a number of tiles; the designs, it will be noticed, are only continual modifications of a general motive, and this may be observed through centuries. Our decorators, ever painfully in search of so-called original, and too often only eccentric, designs, would do well to learn from their Eastern brethren something of this admirable method of producing their artistic results.

In the extraordinary splendour of the sumptuary arts of the East, no small influence may be traced to the lavish magnificence of the Caliphs and Sultan. To the treasures of the palace of the Caliph Mostanser and of Saladin we have previously referred, and the traditions of this splendour have to this day been retained by successive Eastern rulers. The East, indeed, is the land of the sumptuary arts. The rich woven fabrics, the gorgeous embroideries in which the wealthy revelled in the East, composed alike the costume and surroundings of the church and court of the West. To this day in the sacristies of more than one Northern cathedral the vestments will be found to consist of rare specimens of the skill of the Eastern looms in the Dark Ages, when for such luxuries we were dependent on the East. Egypt during centuries was the Flanders of the Middle Ages, and the looms of Damietta were busy in the production of rich fabrics, the smallest fragments of which we now treasure at their weight in gold. In later centuries the Italians were to imitate the Eastern patterns; not a little of the splendour of the Renaissance and even earlier Italian stuffs being largely imitated from Eastern examples. It is, however, worthy of note that the workmen who produced in the now almost dead cities of the Delta the rare and costly fabrics which clothed the Caliphs of Egypt and Persia, the emperors at Byzantium and the popes and princes and high Church dignitaries of the West were Christian Copts who have at all times exercised a powerful influence on Arab art. Little is known of these busy Egyptian looms, but that they were active as early as the eighth century, and generation after generation continued to produce their delicate fabrics, which the merchants of Venice, of Pisa, and of Genoa scattered over Europe.

A branch of the same industry, that of carpet-weaving, is also one in which the Arabs have long excelled, but no single specimen of the art in the Middle Ages has been spared. From the Arab writers we learn of the splendour of the carpets used by the Sultans of the tenth and eleventh centuries, while the rare specimens we possess of the fifteenth, sixteenth, and seventeenth centuries, often woven with gold and of the most delicate colours, only serve to show how degenerate has become the modern art of the Arab carpet-weaver.

How profusely and lavishly the Mussulmans used draperies for all purposes is shown by the luxury of their tents, described by the old writers. The description of Arabi Pasha's tent, captured in our recent victory at Tel-el-Kebir, still fresh in our minds, singularly proves how abiding are the traditions of Eastern military splendour.

Hangings of the most costly nature, we have the evidence of the Arab writers, were largely used in the past to cover the room during winter-time, while their divans to this day afford the Oriental the excuse for the utmost expenditure of luxurious beauty.

As glass-workers, the Easterns have peculiarly excelled, and the rare Mediæval lamps,—one of which, purporting to have belonged to Saladin, is justly considered one of the treasures of the South Kensington Museum,—hanging to this day in some of the older mosques in Cairo show how delicate was the art of the glass-worker and enameller in the Middle Ages.* With the fourteenth and fifteenth centuries, when the art had arrived at its highest perfection, Venice succeeded, through a study of Eastern examples, in establishing her fame for glass, and now in Cairo, a once famous and prosperous branch of industry has completely died out.

Among the other sumptuary arts of the Arabs stands conspicuous their skill as damascene-workers. From an early period they appear to have possessed vases of latten covered with finely-engraved patterns and suggestive inscriptions. The oldest specimens of damascene work,—originally work from Damascus, "*Lavoro alla Damaschina*," the Italians term it,—do not appear to carry us further back than the commencement of the eleventh century, to which belongs the quaint griffin carried by the Crusaders to Pisa, where it now forms one of the treasures of the interesting museum established in the Campo Santo of the famous cathedral. With the twelfth and thirteenth centuries the art would seem to have reached its fullest development, the name of the artist being often found engraved in connexion with the invariable inscription glorifying the possessor. Here, again, Italy was indebted to the East for its skill in damascene work, an art which still feebly exists in Spain and in Cairo; but the days when the Arab warriors lavished on their arms the utmost resources of the damascener's skill are gone, and only in museums can we study the brilliant past of a once prosperous branch of the industrial arts.

Before leaving the subject of the sumptuary arts, a word is due to the skill and beauty displayed by the Arabs in the art of caligraphy. Their Korâns,—not alone to know which by heart, but to have copied every word, is a duty enjoined on every good Mussulman,—are among the choicest creations of the art of the past. The exquisite delicacy of the missals produced contemporaneously in the quiet of our Northern cloisters, is scarcely surpassed by the beauty of some of the old Persian and Arabic manuscripts still in existence. The art is one which, though its past is its most glorious period, has been allowed to decline but slowly, and the delicate manuscripts of Persia, of even the seventeenth century,—such as, if we mistake not, that which forms one of the treasures of the Soane Museum,—are scarcely less beautiful works than the earlier productions of the Arab scribes, in the practice of whose art Sultans themselves have been proud to indulge and excel.

Refined, in fact, in all their existence in the past, the Orientals of to-day are but the creatures of a long train of traditions. Their respect for their past is almost dead; modern influences they worship, and the civilisation of our West, so largely built up on original Eastern foundations, is slowly working its destructive influences on the creations of the past. The East, once the home of the arts, is now indifferent to their existence, and it is now practically left to us Europeans to rescue from neglect and from ruin what still remains in the East of a once brilliant and gorgeous civilisation to which we owe so many elements of our own refinement and culture.

* The Museum of Chartres possesses a glass cup sent by Haroun al Raschid to Charlemagne (eighth century), a delicate work of art, decorated with an inscription wishing its owner "Glory eternal, long and healthy life, and perfect happiness."

THE ANTIQUITY OF THE EGYPTIAN VAULT.

It must be admitted, we think, that, until very recently, in all perhaps but speculative or political quarters, any mention of Egypt has been usually connected in the public mind with inevitable vistas of museum-guarded mummies, mysterious hieroglyphics, vague Biblical memories, and even vaguer notions of the period when all these age-dried antiquities formed the active factors of a living civilisation. Of late, however, we have all found ourselves taking a very different interest in the land of the Nile, and while, but a very short time since, the news that reached us from Egypt announced from time to time the wonderful discoveries of fortunate antiquaries, little heed has of late been paid, notwithstanding articles in our own pages and elsewhere, to the distant generations of Pharaohs so long dead and buried. But now that the clang of war, with its thrilling incidents of the moment, has ceased to resound in Egypt, once more the conquests of the antiquary will be resumed, and, let us hope, under conditions even more favourable to their prosecution.

Egypt and the civilisation of its distant past will always command with the cultivated world a special share of interest from the peculiar position it holds as the precursor of that Classic civilisation on which we have so largely built up our modern complicated existence. There is, indeed, much of our wisdom, our life, and our art that through Rome and Greece can be traced back to the banks of the Nile. We are all aware how largely our architecture is derived from that of our Classic forerunners, who themselves, again, acquired so much of their learning from the Egyptians.

From the stores of his wide professional erudition M. César Daly has recently endeavoured, in the pages of his *Revue Générale de l'Architecture*, to prove an interesting theory of his concerning the great antiquity of the Egyptian vault, the origin and history of which, as the eminent writer truly observes, are singularly involved in obscurity. To the proof of his statement that the vault will be found not alone in the architecture of the Egyptians of the historic days, but in that of pre-historic ages, M. César Daly, with his usual familiar facility of expression and agreeably displayed learning, brings the result of an extensive professional observation. Coming from such an authority, M. Daly's views respecting the antiquity of the vault may be regarded as a distinct acquisition to the literature of architecture.

Research into the origin of a great people is so constantly, as the writer remarks, met by the evidences of exterior influences, that the difficulty is considerable in tracing any single point to its apparent origin. If, however, a continuous and uninterrupted evolution,—one social, political, religious, æsthetic, and technical,—ever did exist, we shall find it in Egypt. Isolated as the country was, eminent authorities have none the less urged on philological grounds that Egypt was originally occupied by a band of Asiatic emigrants; but, should this view be correct, the civilisation they introduced must have been singularly imperfect, for not a trace of its existence is to be found in the arts of Egypt.

The geographical character of Egypt, a narrow valley of verdure, stretching between two vast deserts and watered by the Nile, has of late been made too familiar to render necessary any lengthy details. The Mediterranean, we have evidence, formerly reached as far south as Cairo, the vast tract of the Delta having been formed by the alluvial deposits of centuries; the deposit in the present day being as active as ever. The excavation of many Egyptian edifices has shown that the soil has risen round their base since their construction,—at Thebes, M. Daly says, as much as 16 ft. The Nile, in addition to thus having created the very soil of the country ("Egypt," said Herodotus, "is a gift of the Nile"), has served from all time as the great highway; the rafts of branches and reeds still used on the river resembling unquestionably those used in the most distant days. Along this silent highway has passed all the traffic of Egypt during thousands of years.

Wood, suitable for building purposes, is, and always has been, rare in Egypt, while the quarries have at all times been numerous. As the inhabitants acquired the knowledge of the use of tools, they commenced to utilise the stone, while at the same time they used bricks. The existence, however, of this comparatively advanced state of civilisation pre-supposes a much earlier stage, prior to this period, before the invention of the tools requisite to work the palm, the sycamore, and the acacia,—the chief wood of the country,—or the limestone, the granite, and still harder porphyry.

How, asks M. Daly, were the Egyptians lodged, say 10,000 years ago? A period as distant as this is positively needful, he urges; the oldest specimens of Egyptian architecture and sculpture showing clearly the evidences of a long previous technical and æsthetic experience, so slow, too, when unaided, is the early progress of a nation. It is outside the question to speak of the caves that formed man's first shelter; on the same ground, the tent, that early formed the home of the wandering Egyptian, is too foreign to the development of architecture,—and especially of the vault,—to require attention.

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What was the first form of fixed habitation that the prehistoric Egyptian built for himself? The materials at his disposal were not many; scattered about he found stones; in the river, reeds; on the banks, mud. With these simple materials the primitive Egyptian built a hut just as does to this very day his scarcely less fortunate descendant the *fellah*. A square hole dug in the ground surrounded by four walls of mud and reeds, a roof of cane covered again with branches and grass, amply sufficient in a climate where it never rains, but where the dews are abundant,—such is the hut of the modern *fellah*. Though it might be imagined that it would have been preferable to build the walls of stones, yet such a system has never prevailed, even to this day, the mud walls being probably found to resist better the night dews and the heat. At the present moment unbaked bricks are preferred by the *fellaheen* to stone, except where mud is not to be obtained.

Primitive as is this system of building,—requiring no other tools but, perhaps, a piece of stone or the horn of some animal,—it is M. Daly's opinion that the prehistoric Egyptian must have adopted an even more simple method of making for himself a shelter. "He formed a heap of sand of about the desired size of his hut, he then threw over this a layer of Nile mud; the mud, once dry, he simply dug out by an aperture,—eventually the door,—the sand which had served as a mould, and his house was made, without stone, without scaffold, or without reeds." With a circular base the form of this shell would necessarily be that of a blunted cone, which, affording but very small interior space, experience would soon dictate an ovoid or beehive shape. When, however, such a habitation had to be enlarged, from the inability of the constructor to cover anything but very narrow space, the plan would have to be lengthened and the hut given something of the form of an up-turned drain-tile. This view of the progressive advance in the form of the vault, M. Daly urges is supported by the ovoid curve found in the old brick vaults still existing at Thebes and elsewhere. Such a hut,—to be found to this day in Egypt,—is essentially one of the primitive forms of the human habitation.

"The oldest house in Egypt offers, therefore," says M. Daly, "the rough appearance, in the first place, of a dome, and, later on, of a vault. This conclusion will surprise some architects accustomed to consider these forms as the work of the maturity of architectural skill, and not as being the first-born productions of its genius. Here the dome precedes the vault as it does the isolated arch; absolutely the inverse of the generally accepted idea, that the arch preceded the vault, and the vault the dome, a view the result rather of abstract and scientific than historic research.* The voussoired arch is, in fact, simpler in conception and execution than the architecturally-constructed vault, and this, again, than the dome. The error, it is M. Daly's opinion, arises from the theoricians having somewhat too philosophically argued from the idea to the fact, instead of from the fact to the idea, as also from an imperfect distinction having been drawn between the *form* and its *execution*. Hence the *moulded* forms of the dome, the vault, and the arch have been entirely lost sight of. A study of facts would, he argues, have certainly avoided such confusion. A knowledge, even superficial, of the savage hut in the different parts of the world would have sufficed to show that we find, in a rough state, it is true, in the rudimentary efforts of primitive peoples,—anterior to the creation among them of a style of architecture proper,—almost all the regular forms which have served successively as the basis on which the *styles* have been constituted."

While mud is still largely used in Egypt as a building material, M. Daly states that it has long since ceased to be employed to form such moulded vaults as he describes being made in the past. Mud is still used for many purposes, to form, for instance (modelled into various rude architectural shapes), the tomb of the *fellah*; but excellent reasons explain the discontinuance of its use for the moulded vault. In the first place, such a form of roof could alone be used to cover a very narrow space, for it easly cracks; while a vault of unbaked bricks possesses an elasticity permitting of its use over large spaces. With the invention of the unbaked brick,*—easier to transport than wet mud,—the principle of rude architectural construction must have soon replaced the primitive method of the sand mould. To this day the house of the *fellah*, with its vaulted roof of unbaked bricks, will be seen in every village side by side with the primitive hut simply covered with branches, reeds, and grass. "The two systems of houses," writes M. Daly, "the flat roof and the vaulted, are at this very moment still to be found existing together, as they did doubtless thousands of years ago, with the sole difference that the invention of bricks has introduced into the execution of the vault a greater correctness of form and a science of construction unknown to the first inhabitants of Egypt. The form of the vault is more often in the present day semicircular, and the processes of execution have ceased to be as rude as in the past.†

It would not appear, however, according to M. Daly, that even after the invention of the more scientific mode of constructing the vault, the Egyptians ceased to employ the older method; it would seem, indeed, that they regarded the architectural vault with "a pronounced æsthetic aversion." They used it, it is true, but the priests avoided its introduction into the temple, the rich employed it only rarely in their dwellings. It was abandoned to the hut, the storehouse, and the tomb. The use of the vault, in fact, after the discovery of the process of its architectural construction appears by no means to have received the welcome with which one would suppose such a progress would be hailed. This curious feature of the objection of the Egyptians to the use of the vault, and yet their introduction of it into their architecture, is to be alone explained, it is M. Daly's opinion, by a proper understanding of the influences under which the æsthetic genius of Egypt was formed. This, of course, is a subtle question, which M. Cesar Daly reserves to a future occasion to fully discuss.

We add a translation of a portion of the article touching "The Invention of Bricks":—The invention of bricks may have had various origins,—that is to say, it may have been occasioned by different causes, in different places, or even in the same country. It is incontestably due to a want, and any want for which it provides may have given rise to the invention, or may have contributed to it. I may cite one of these possible origins,—that is, the greater facility of transport of brick as compared with soft and heavy clay. Another origin may, perhaps, be discerned in the necessity under which the early inexperienced builders laboured of rapidly repairing vaulting which was cracked or threatened to fall. A small crack could be filled up with a handful of mud, but the wider this crack became the greater the importance to remedying it promptly, and the soft mud would be ill adapted to repair it. Not being supported from below as it was during the construction of the dome, the mud of which it was composed tended to fall into the interior of the hut by its own weight, and softness combined; while, on the other hand, dry tompions, cemented together only by mud, did not present the same disadvantages. Thence, perhaps, arose the custom of keeping tompions of dry clay, as is done upon our vessels of war, where tompions are prepared beforehand to fill up the shot-holes made in the hull.

There can be no doubt that forethought is a quality which appertains more especially to civilised peoples than to those bordering upon barbarism; but the frequent accidents occasioned by the ineptitude of the early Egyptian builders, and their entire ignorance of the forces set in motion by the construction of vaulting which led to repeated failures in construction, must in the long run have awakened in them the sentiment of precaution. In any case, it is possible, and even probable, that the Egyptians, who were good observers, and not stupid, as historical records show us, if, as I say, the Egyptians took the precaution of preparing beforehand tompions of clay: these could not fail to take the form of bricks by reason of their being more readily handled, moved, and stored. If this suggestion be true, the most ancient bricks would be of small dimensions. Cracks, for instance, from 6 in. to 8 in. wide, would be too large for mud without any support upon the inside of the dome, but if the mud were strengthened by dry bricks the whole became sufficiently strong. In the case of a settlement, or the fall of a portion of a vault from 6 in. to 8 in. wide, it would be necessary to employ two of these bricks; three or four for a larger opening: experience of the juxta-position of bricks with plastic joints would lead naturally to the idea of a vault of brickwork. The oldest bricks measured by me (at Sakkara) confirm this impression of the antiquity of small bricks. Those belonging to the second or third dynasty, of which I have a specimen, are 0·135m. × 0·07m. × 0·10m., or $5\frac{3}{10}$ in. × $2\frac{7}{10}$ in. × $3\frac{94}{100}$ in., or very nearly 4 in.

THE FLOODS AT BATH AND BRISTOL.

Even a hasty journey through the district between Bath and Bristol last week would have been sufficient to prove that the accounts which the daily papers gave us, from local sources, of the devastation caused in this district by the extraordinary rainfall of the early part of the week were in no respect exaggerated. Indeed the published accounts fell short of conveying any adequate idea of the reality. Those whose chance it was to pass along the Great Western Railway through Bath on Wednesday, the 25th, will not readily forget the scene that presented itself in bird's-eye view from the railway embankment and viaducts. In crossing the outskirts of the town from the London side, before reaching the station, we seemed to be passing over a colony of "lake dwellings." Squares and streets of houses rose from the midst of an expanse of water, amid which was seen, here and there, a boat going from house to house, or, in the shallower portions, a tradesman's horse and cart slowly feeling the way for fordable points. Melancholy as the scene appeared from here, it was nothing to the state of things as seen from the viaduct on the Bristol side of the station. Here the Avon takes a sweep round, running under a viaduct from the south to the north side of the railway line, this being at about the lowest ground of the town. The river is lined with houses, between which and the water runs a small paved quay, about 10 ft. or 12 ft. wide; and the surface of the river is ordinarily 4 ft. or 5 ft. below the level of this quay. On the 25th, it was 10 ft. or 12 ft. above the quay, and from the railway viaduct the extraordinary sight was presented of a swelling torrent of water pouring along at the height of the first floor of the houses, the walls of which formed the visible margin of the stream, which must have been running with a velocity of seven or eight miles an hour. This was towards the close of the afternoon; in the morning of the same day it had, we believe, been higher. The Great Western Station at Bath was high enough to be out of reach of the flood; but there was no exit from the station except by the high-level bridge crossing to the hotel at the other side of the road; and during the day there was considerable apprehension of this being carried away by the timber and other *débris* brought down by the current. How the houses could stand for an hour against such a rush and weight of water it is difficult to understand; a visit to the spot two days after, however, showed that little damage had been done to the walls. Along the before-mentioned quay, railings, and the kerb-stones in which they were set, had been twisted out of place, but the solid walls of the houses showed little result from the action of the water, and their comparatively uninjured appearance certainly speaks well for stone as a building material, at all events for resisting forces of this kind, as compared with

* The form of the arch, M. Daly urges, may have been originated with that of the dome, for the door of the beehive hut may have been arched; the isolated arch, on the contrary,—as we see it in the Roman triumphal arch,—must have appeared only late in the architectural evolution, being probably posterior to the invention of the brick. M. Daly states from his experience in Egypt that he has never met with the isolated arch, except, perhaps, at Assassif. As to modern Egypt, arches will be found in the façades of those *fellahs'* houses which are covered with a cylindrical vault, a vault which, however, is closed at each extremity by a straight wall, in one of which will be found the entrance to the house. Historically, remarks M. Daly, it seems to me that the form of the arch is as old as that of the dome and the vault, but that its isolated construction by voussoirs is later than theirs.

* M. Daly has a theory,—which, it is true, he puts forward only as an hypothesis,—that the brick originated in the plug of dried mud prepared to fill up any cracks that might present themselves in the mud roof or walls of the primitive hut, and this view the writer supports by the evidence of the very small size of the bricks found at Sakkara. The use of stone for building purposes is only mentioned in the time of the second Pharaoh of the third dynasty (in a passage from Eusebius quoted by Brugsch); and yet the first Pharaoh of the first dynasty, we have evidence, founded great cities (Memphis, for instance), which could scarcely have been erected simply with wood, small stones, mud, and reeds.

† The sketch given by M. Daly of a view of a group of houses at Edfou, some covered with vaulted roofs, others covered with branches, is very interesting, as showing the extraordinary tenacity of antique traditions among a community still unaffected by modern influences.

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brick. One reason, no doubt, is that stone walls, to be impervious to damp, and to make at all decently-habitable dwellings, must be of a certain thickness much beyond that which is supposed to be necessary for brick walls in the same class of house. The houses which were thus obliged to measure their strength against the rush of water were among the poorer habitations of the city, and Bath stone is not among the strongest of building stones, yet their shells had stood nearly unhurt. What would have been the fate of a set of ordinary speculating builders' brick houses under similar circumstances? They would have been bodily swept away.

The scene from the railway after leaving Bath was not less extraordinary to those who knew the usual aspect of the landscape. The swollen river, relieved from its partial confinement amid the houses, spread out over the country far beyond the usual line of its banks, which was completely obliterated; the whole of the land between the railway and the low hills opposite being occupied, for part of the route, by a waste of moving water. On arrival at Bristol, we were told that the same state of things we had witnessed at Bath might have been seen in the low-lying portions of Bristol at the same time. As far as one could judge from an after-inspection, after the water had partially abated, it does not appear that the flood had prevailed here in quite such extraordinary proportions as in Bath. The Avon where it passes Bristol is a tidal river, and has superfluous space in its channel, except at a very high tide, for taking away a good deal of water; and there is not so large a proportion of low-lying ground covered with houses. The major part of the damage in Bristol was in the region known as Baptist Mills, in the neighbourhood of the lower end of Stapleton-road, and the overflow was chiefly from the Froome, a tributary of the Avon, which runs through this portion of the town. A good deal of the low land here is open ground, building land, and rope-walks, &c.; and over this the water was lying in lakes the next day, while the Froome was running "full bore" between its banks, and evidently much above its usual height; but the damage that had been done did not present very marked external evidence to the eye of a visitor. The difference between the power of brick and stone walls to resist the force of water, to which we have already alluded, was however, illustrated in this part of Bristol, where in one or two places brick parapet walls of considerable thickness (much thicker than the ordinary speculating builder's house wall) had given way and fallen flat at once on the waters rising above the ground-level on the other side of them. This point has its practical significance at present in reference to the possibility of barring out the high tide-waters of the Thames from the streets and houses of the Lambeth district and elsewhere. The experience at Bath and Bristol seems to show that a good stone wall of coursed masonry will resist a considerable water pressure for some hours at least, where a brick one will not.

Although the visible damage to buildings was not so great either in Bath or Bristol as might have been expected, the amount of loss to the inhabitants of the districts inundated has unquestionably been immense, and it is to be feared that many of the dwellings inundated cannot for a long time be inhabited without serious risk to health. The wealthier population in both towns are bestirring themselves to give relief to the sufferers, and considerable sums had already, when these remarks were written, been collected for this purpose. The point which ought to be considered, however, is whether any preventive measures can be taken to lessen the danger and loss in the case of future floods. This is rather a difficult question. It is about forty-five years since a flood of the same magnitude swept down the valley of the Avon, as we learned from a dweller on the bank of the river at Bath, who had been there since the last flood, and was able to fix the date approximately, and remembered it as having risen, if anything, rather higher than the recent one. If there is no reason to expect that there will be another such visitation for half a century, it must be admitted that it is hardly in accordance with true economy to go to any great expense in changing the sites of dwellings, and providing extra outlet for the river channel, to meet an event of which we can only say that it may possibly happen again at some distant period. The reasoning is the same as that which we go upon in calculating the required dimensions of sewers, in regard to which it has long been pretty well agreed among engineers that it is not worth while to construct sewers on the scale necessary to ensure the rapid removal of the rainfall from an exceptionally violent thunderstorm. And in regard to the upper part of the Avon, nothing could be done except what would involve engineering operations on a very large scale, and the complete transformation of the river channel. It may, however, be advisable that the local authorities at Bath and Bristol should direct some municipal legislation against the erection of houses in places which are known to be liable to floods in bad seasons; and while allowing the present dwellings to run out their life, to prevent speculators from rebuilding in the same dangerous locality. This is hardly a case of *caveat emptor*, or not simply that; the owners of the property will, no doubt, suffer loss, but they have carelessly and thoughtlessly led to almost the entire ruin of the unfortunate tenants, mostly of the poor and uneducated class, who have entrusted their all to houses which those who built them knew to be in a hazardous and unhealthy situation. And if it is rational to legislate against the building of houses for human habitation on unhealthy or insecure foundations of rubbish, or with inadequate materials, it should seem equally rational to place some legislative restriction on the building of houses where they are liable to be flooded. This seems to apply, as far as we can see, more especially to the Bristol case, where the houses which have been drowned out were mostly of a very jerry description, and palpably built as cheaply as possible, and without regard to possibilities of effective drainage even under ordinary circumstances, and leaving the ravages of floods out of the question. And in the case of the Bristol flood, the difficulty appears also to be more within management, for it would be possible for the Corporation to embank the Froome so as to enlarge its capacity of channel considerably, and also to provide an extra outlet for storm waters without any ruinous expenditure. The scale is smaller than in dealing with the Avon itself, and the mischief and its remedy more within compass. Another thing which might very well be done would be to raise some of the lowest-lying portions or hollows of Stapleton-road, the principal road leading down to the district inundated, which was flooded deeply in one place, and in which, the shops and dwellings being of a better class, the pecuniary loss of individual owners or tenants was much more serious than in the case probably of any individual instances in the poorer portion. The raising of the roadway would be followed by the raising of the shops and houses as soon as their rebuilding became necessary; and though the occupiers of the better class of property call for no more sympathy than their poorer neighbours, the loss of property is a much more serious thing to make up to them in their case. There was one additional danger and inconvenience to which the inhabitants of Bath were subjected, and which brought even those who were out of the reach of the water within the unpleasant consequences of the flood; this was, that the city was suddenly deprived of gas by the drowning of the fires at the gas-works. This is an evil against the recurrence of which the local gas company ought to be able to provide, and, we hope, will provide.

It would be, of course, possible to embank the Avon artificially so as to allow for a great rush of water from the higher lands without the present disastrous overflow and devastation; providing, of course, extra artificial drrinage for the low lying ground; and perhaps it is a subject which ought to be taken into consideration by Government, under proper professional advice. We surmise, however, that it would be an open question whether the expense of making and keeping up such an artificial embankment would not be a heavier drain on the public purse, or on the resources of the Avon watershed district (in whichever way the expenditure were met) than the loss caused by a flood such as the present, which might not happen for an even longer period than has elapsed since the last one. A satisfactory answer to the question, however, could only be given on the basis of statistics as to the more frequent damage arising from the flooding of the district from insufficient surface drainage in years of no more than ordinary winter rainfall; which may be considerable, and such as, in conjunction with such extraordinary floods as the recent one, to justify a large expenditure on economic grounds. The subject should be looked into.

THE FRENCH GALLERY.

It cannot be said that the present Winter Exhibition at Mr. Wallis's gallery contains any very remarkable painting, though there are some interesting specimens of the work of artists whose names are known there, and one or two by unfamiliar names which are of interest. Madame Henriette Browne's "Alsace, 1870" (153), is the largest and one of the best works there. This is a half-length, the size of life, of the figure of a lady of the red-cross sisterhood, apparently soliciting contributions for the wounded, as she has before her on a table a bowl full of miscellaneous coins, to which the action of her hands appears to draw attention. If the title is intended to indicate any special illustration of the case of the annexed province named, we fail to see where the meaning comes in. The picture is, in fact, a life-size study of a figure, of which the face is remarkably well painted, but the work as a whole has not the power of effect nor the interest and character which mark this artist's finest work. Professor Müller's "Guardian of the Sacred Well" (60), on the opposite wall, is a capitally-painted picture, rather deficient in subject, two figures relieved against a piece of wall with crumbling details of architectural ornament, which wall, with the hot sunlight upon it, forms perhaps the best part of the painting. "In the Fields, Brittany" (15), by M. Julien Duprè, is a work of more character and originality; it represents a couple of rustics, a young woman and young man, carrying between them a load of hay, the youth in the rear stretching up his head to get a look at his companion over the intervening pile of hay: the artist has attempted to convey strongly the idea of the effort of weight-carrying, in the manner of the girl's walk, which is uncouth, but characteristic. The faces are expressive and powerfully painted, and the picture has the special interest that it shows some variation from the usual type of "field labour" pictures, in which so many French painters have followed the lead of Jules Breton. Mr. W. H. Bartlett's "Mussel Gatherers, Venice" (22), has the same kind of interest; it is individual and distinctive, though the subject is slight enough, being merely one or two lads, naked except for bathing-drawers, wading about in the water for the shell-fish. The figure of the nearest boy is excellently drawn and painted, in a style at once broad and realistic. The water and the low background are very slightly treated. There is no sort of "composition" in the picture, which is ugly, but clever. Mr. Dicksee's "Hermione" (146) is expressionless enough for a statue, but if, as may be presumed, the work is intended as an illustration of Shakspeare's heroine personating the statue, the artist has forgotten that she is specially described in the play as showing in her countenance the effects of the ravages of time, during the many years in which she had been supposed to be dead.

Among the small *genre* pictures which often form the most interesting items of this collection are two very pretty specimens by M. Duverger, "Dolly's Dressmaker" (11) and a still better one of the same size, in which the same little girl is shown as "A Partial Critic" (18) of her own portrait. Herr Seiler's two works, "A Freischütz Bargain" (56) and "Arguing out the Point" (62), form an effective contrast, and exhibit the same delicate finish and power of depicting character in low life and in high life respectively; the figure of the gentleman listening to the argument in the latter painting is very good. "Rent Day in Germany" (42), by Herr Oehmicher, displays some humour and good execution. Two of the best-painted things in the room are the two heads by Herr de Blaas, "Ripe for Mischief" (47) and "From the Sunny South" (72); the first the head of a dirty and mischievous boy, the latter that of a girl whose full colour and plump rounded features agree well with the title of the painting. Mr. Webb's "A Genuine Aldine" is a very agreeable scene in a nondescript bibliopole's shop, where a cloaked figure is bargaining for a rare book; it has the particular merit of being arranged with a view to that effectiveness of grouping and lighting which is notably wanting in some of the *genre* pictures of the more realistic school; and the

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same may be said of Mr. Mowbray's "The Aquafortists" (56), though there seems no reason for the exceedingly melancholy expressions of the man who is applying the acid to the plate. A "Flemish Bird-stuffer" (76) by M. Lagye, is a clever and careful study of Mediæval costume and of the effect of light through semi-transparent glass.

The landscapes by Herr Heffner do not keep up to the remarkable excellence of some specimens of his art which have been exhibited here of late, though it is only in comparison with some of his own previous efforts that they could be regarded with any disappointment. "Smiling Spring" (7) is, however, a very admirable landscape, in which the artist has realised the peculiar character of spring landscape with great success. Herr Windmaier, whose small and delicately-painted scenes, in which he repeats himself a good deal, have always been among the pleasures of this exhibition, is represented this year by a work on a larger scale than is usual with him, "The Rising Moon, Lake Starnberg" (104),—a very highly-finished attempt to realise moonlight effect. The artist has avoided the mistake so commonly made in moonlight scenes, of putting too much detail nto his landscape, and thus destroying the mystery of moonlight; and the sky is fine, though perhaps a little artificial in effect. It is, however, seldom indeed that one sees a moonlight painting which really gives the actual effect of moonlight; the effect here is just a trifle "stagey," but it comes nearer than the average of moonlights even by able artists. Nothing in landscape-painting seems easier than to convey the general effect of moonlight,—up to a certain point; nothing more difficult than to pass that point, and achieve reality of effect. Munthe, the unequalled painter of snow scenes, is not represented; there is a snow scene by Herr Gegerfelt, in which the snow seems to be scattered not only over the ground, but over the sky as well, which is as solid as the rest of the scene, suggesting the idea that the painting might be seen either way up with nearly similar results. Mr. F. W. Hulme's scene at "Bettws-y-Coed" (14) is a good-sized picture, reminding one of a past era in the art, a solidly-painted landscape in Academic style, very satisfactory in its way, but deficient in variety of local colour. Among the best landscapes are three very small but full and powerfully-painted studies by Herr Fink, "An Autumn Evening," "Noonday Rest," and "Study from Nature" (106, 115, and 162); these are admirable little works, painted in a truly artistic spirit.

THE WINTER EXHIBITION OF CABINET PICTURES IN OIL.

DUDLEY GALLERY.

As in the French exhibition, so in this, the most noticeable work is a life-size study of a woman, in this case "A Peasant Girl" (166), by Mr. G. Clausen, and certainly one of the best works by this artist that we have seen. The face is a very interesting one, the general figure that of a robust young woman in perfect health, the flesh finely painted, the hands well drawn. The figure, rather more than half-length, faces the spectator, leaning on a long staff. This is a piece of thoroughly sound and unpretentious painting. Among other paintings of the *genre* class, on a smaller scale, "A Cornish Lad" (79), by Mr. Jansen, is a powerful little work, in which the figure, not without character, passes, however, as part of a study of what used to be called "chiaroscuro," from which the figure emerges as the salient point. Contrast in artistic method is represented in its greatest force in comparing this with Mr. Val. Prinsep's "Wood Gatherer" (254), in which the face of a peasant girl (one presumes) gathering wood is painted in the neatest and most precise and finished manner. After looking at some others of the "rough" school, this strikes one as hard and prosaic,—it is not poetic, at all events; but there is no doubt that the "rough" element is too prominent in some of the painting here, as in Mr. Hugh Carter's "Net-mending" (96), where the modelling of the features is altogether omitted. Mr. Howard Helmick's study, "The Contented Mind" (239), which is sketchy throughout and therefore in keeping, is one of the best pieces of humour in the gallery, and very effectively treated altogether; it represents the contentment of a man in a scantily-furnished room cooking a herring before the fire on the end of a fork; though not highly finished, the whole is handled in a truly artistic spirit. Mr. Watson Nicol's "finished sketch" of an Irish lout in his cabin is very clever, but somewhat vulgar. Among things which are clever, and quite the reverse of vulgar, are two small works by Mr. David Bates, on the screen, "Returning from the Moor," and "Heather Gatherers" (403, 420), slight combinations of figures and landscape showing real poetic feeling. Mr. Hamilton Macallum, in "A Summer Half-Holiday" (80), shows a slightly painted, but fresh and breezy, sea-shore scene, with a number of boys bathing and splashing in and out of the water; more might have been made of the figures, but the whole is a large sketch rather than a finished picture. Mr. James Hayllar's two heads, "A Connoisseur" and "Patchwork" (197, 213), are clever, and Miss Maria Brooks's "La Tricoteuse" (87); and Miss Bertha Newcombe has realised a pretty effect in her little painting called "The White Calves" (321), in which the animals and their girl-keeper are ranged in a kind of frieze fashion, with a stone wall for a background. Mr. Mullins's terra-cotta head, "A simple Child," and Miss Barlow's small studies of animals in the same material, on the centre table, should be looked at.

Among landscapes there are two by Mr. Joseph Knight, 74 and 85, which are very good, the latter, "With Verdure clad," the best. Studies of foreground, or in which foreground predominates, are rather numerous, such as Mr. F. Walton's "Ankle-deep in English Grass" (49); Mr. Parsons's "A Thames Garden" (65), a study of water-plants and rushes; Mr. H. E. Bowman's "A Deserted Garden" (93), a small work highly finished in detail; Mr. Walter Wallis's "Cutting Old Friends" (219), the old friends being a bed of cabbages. On a larger scale are Mr. Hemy's two sea-pieces, "Rowing for the Port" and "The Morning Catch" (161, 176), and a fine little landscape by Mr. de Breanski, "Marsh to Walgrave" (337), a rainy river landscape overhung by sweeping clouds, which might have had a better place in the hanging. Mr. F. Dillon's "Festival of the Cherry Blossoms, Osaka, Japan" (122), is a brightly-painted and rather highly-elaborated open-air scene, of considerable interest in more than one respect. There are some clever little bits of still-life painting, such as that by Mr. Handel Lucas (48), and "Memories of Schooldays" by Mr. E. Holliday (57); and M. Fantin shows his splendid gifts as a painter of flowers to perfection in such works as "Autumn Flowers" (181) and "Fleurs de Poirier et Cerise" (415).

GOUNOD'S "REDEMPTION" AT THE ALBERT HALL.

THE first performance in London of Gounod's oratorio attracted to the Albert Hall on Wednesday evening one of the largest audiences that has ever been assembled there; and whatever opinion may ultimately be formed of the position of the composition in modern music, it was certainly a very impressive spectacle to see such an immense concourse of people listening with rapt attention to a work of such serious intent, in which there is not from beginning to end a bar written for mere display or effect. The "Redemption," indeed, must be judged of from a standpoint of its own; it is not so much an oratorio as a religious service, in which a great musician and a devout Catholic has brought all the resources of his musical genius to the expression of his religious creed. It is this strong prevalence of devotional feeling in the work which leads to it assuming the character which some listeners have found rather monotonous and musically deficient in effect,—not altogether without reason. The religious feeling of the composer has apparently led him to reject in great measure the ordinary resources of melodic expression in the solo voice parts, as if he thought the mere enunciation of the sentences in musical tones sufficient to impress the hearer; so far, that is to say, as the voice parts are concerned. The musical expression and colouring in these portions are supplied by the orchestral accompaniments, which are throughout of the fullest, richest, and most finished description. Those who are acquainted with the modern theory of operatic music as developed by Wagner will recognise that in such a treatment there is somewhat of the application of the same theory to oratorio music, though without the noisy and tumultuous effects into which Wagner is too often betrayed. Everything is well balanced and in due proportion to the expression of the whole.

The oratorio is divided into three main sections:—"Calvary," "From the Resurrection to the Ascension," and "The Pentecost"; and these again are subdivided into what may be termed short scenes, such as "Mary at the Foot of the Cross," "The Two Thieves," "The Holy Women at the Sepulchre," &c. There is nothing like what is usually called an "air" for any of the solo voices, and only one instance of extended choral writing, in the concluding chorus. One of the most prominent and beautiful features of the composition is the melody for the orchestra (it is never heard in the voice parts) which, in the language of modern musical criticism, would be called "the Redemption theme," and which springs up continually whenever the mission of the Saviour is referred to, always with fresh beauty, and reaches its climax at the close of the second part, where, after the short and striking chorus, "Unfold, ye Portals everlasting," this theme is given out in jubilant strains by the whole orchestra, with an effect which is quite ethereal, and must be heard to be realised. The thoughtful spirit in which the composer has viewed his subject is shown, among other things, by the passage entitled the "March to Calvary," which sounds startling until we perceive that the object here is to indicate the temporary triumph of the Pagan spirit. Among other salient points in the work may be mentioned the pathetic chorus, "O my Vineyard," the chorale, "For us the Christ," with the beautiful change of feeling at the words, "Faith unswerving, holy Hope," the chorus, "Lovely appear over the mountains," and the final chorus, which commences with a melody sung by the male voices of the chorus (somewhat resembling in character the composer's well-known song, "Nazareth"), and afterwards repeated in harmonised form by the whole chorus.

The work was very ably performed by the Albert Hall Choral Society, conducted by Mr. Barnby; the chorus parts present little difficulty, it is true, the intricate work being all for the band, which was quite equal to its task. The solo singers, Madame Albani, Madame Fassett, Miss Edith Santley, Mr. Pyatt, Mr. Lloyd, and Mr. Santley, sang the music with the feeling of true artists, making no attempt at display where none was called for. We go a little out of our way to devote a few words to it, believing that a good many of our readers who were unable to be present would be interested in hearing something about a production which, though it has its limitations from a musical point of view, we are inclined to think will lay hold of the public mind in this country, and prove an important contribution to our list of sacred music on a great scale.

AN ELECTRIC TRICYCLE.

RECENTLY inquiries appeared in our correspondence columns as to whether a tricycle could be lighted by electricity. We now learn that the improvements in the storage of electric energy and in electro-motors have so far advanced that tricycles can not only be lighted, but also propelled solely by electricity, as was seen from the tricycle ridden last week by Professor Ayrton in the City. The Faure accumulators, in which the energy was stored for the lighting and driving, were placed on the footboard of the tricycle, and the motion was produced by one of Professor Ayrton and Perry's newly-patented electro-motors placed under the seat of the rider. Using one of these specially-made tricycle electro-motors, and the newest type of the Faure accumulators, the total dead weight to be added to a tricycle to light and propel it electrically is only 1½ cwt., or little more than that of one additional person. In the tricycle ridden by Professor Ayrton the ordinary foot-treadles were entirely absent, so that there could be no question as to electricity being the sole propelling agency; but with ordinary electric tricycles it may be desirable to leave the treadles, so that while electric propulsion alone is used on the level, the rider can, on going up a steep hill, supplement it by using the treadles, instead of, as at present with the ordinary non-electric tricycle, having to get out and ignominiously push his tricycle up the hill before him.

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THE INFERIOR OR ADULTERATED CEMENT QUESTION IN GERMANY.

The latest phase of the discussion which has for some time been going on in Germany with respect to the question of inferior or adulterated cement is represented by a statement published and circulated in the name of a committee representing the Association of German Cement Manufacturers. This publication is in the nature of a reply to the opinions put forward by Dr. Michaelis, of Berlin, in reference to the alleged improvement of Portland cement, by the addition of a certain quantity of blast furnace slag or cinder. This gentleman, in an article he wrote in one of the technical periodicals, had contended that "an addition of suitable pozzolana to cement increases the cementing power or quality of the latter," but he admitted that a favourable result was dependent on such delicate conditions as to the particular nature of the cement employed, and as to the character and quantity of the material to be mixed with it, that in practice any such addition could hardly fail to be highly dangerous unless the admixture were made under the eye of the purchaser and user of the article. Dr. Michaelis, the critics remark, in testing whether a cement is adulterated, would be willing to allow the question to be asked whether the material mixed with it has been added for the sake of making a profit. The writers proceed to say,—"Of course he knows as well as any cement manufacturers that a wagon-load of pulverised furnace slag, weighing five tons, can be obtained at the works, in Rhineland, for 16s., and this quantity of material when mixed with cement represents, at the cement works, a price of 300s.; and further, that furnace slag in other districts, or the various other materials which may be employed in its place, could be bought and sold at similar prices. And yet, as a matter of fact, in no such mixtures can Dr. Michaelis discover any evidence of an attempt at making improper profit. In fact, he can find no adulteration. He does not regard as adulterations any admixtures that do not degrade the quality of the article, but which leave it, in this respect, either unaffected or perhaps improved." The Association of German Cement Manufacturers have, on their part, passed a resolution against additions of every kind. Dr. Michaelis, on the other hand, claims an exceptional position for his pozzolanas, and especially for furnace slag; but, without any explanation, he has abandoned chalk and limestone. His critics proceed to say that "if we examine his theoretical observations respecting the effects of pozzolana additions, all we can find under the numerous reservations with which he puts forward his statements is the well-known fact that certain cements which are not entirely free from defects may, to a certain extent, be corrected by the addition of certain finely-ground materials in limited quantities. Such an expedient, however, no one has ever regarded as anything but a makeshift, applicable in cases where we have to deal with the peculiarities inherent in certain kinds of raw materials employed in the manufacture of cement. In such circumstances the Association of German Cement Manufacturers permits the additions of suitable correctives to the extent of two per cent., because with such a small percentage, the charge of making fraudulent additions purely for the sake of profit cannot possibly be maintained. It is a fact that blast-furnace refuse is, by many German firms, now habitually added to their cement in enormous quantities, amounting often to as much as 40 or 50 per cent., and each of these firms uses several wagon-loads of such refuse every day in the manufacture. When, therefore, Herr Michaelis proposes to establish a wholesale business based on the addition of pozzolana, he ought, at least, to furnish evidence showing that the article he produces is an improvement upon, or, at any rate, not a debasement of, the quality of the genuine material; but this proof he has failed to give. So far, is fact, is he from doing so that the numerous restrictions he imposes on the use of the foreign materials show clearly enough that he is himself conscious how extremely dangerous is the employment of such additions, and that, therefore, under the temptation of large profits, these additions are likely to be made on so large and constantly increasing a scale, that the result in the end cannot fail to be most pernicious. Dr. Michaelis has published some tables showing the results of his systematic experiments in testing the tensile strength of his mixed cement; but they teach us nothing to the purpose, for he does not, in these experiments, deal with samples of the mixed cements manufactured by help of furnace-slag, and now brought in enormous quantities into the market. Instead of this, we are furnished with figures representing the strength only of small samples, prepared with scientific accuracy by Dr. Michaelis himself in his own laboratory for the purpose of being experimented upon; Dr. Michaelis, moreover, fails to state the degree of fineness of the cements and of the materials he added to form the compounds tested in his experiments,—data which are very necessary for forming a judgment on the value of his tests. However, his numbers as they stand simply go to show that really good Portland cement is only deteriorated by the addition of furnace-slag; and it is further clear from Dr. Michaelis's own tables that this deterioration makes itself felt in the long run. Let us now ask in what the alleged improvement of these cements consists so far as cement-users are concerned. It is, in the first place, admitted that such cements are inferior as regards the initial strengths. Are consumers to wait one or two years before they can ascertain whether the materials added were the right ones, or whether they were employed in the right proportions? As regards the twenty-five per cent. superiority which Dr. Michaelis claims for them in practical use, he overlooks the fact that, so far as the purchaser is concerned, this advantage has no existence at all, because he pays for the mixed cement the full price of the genuine and pure cement. In addition to the above objections to the figures in Herr Michaelis's experimental tables, we must add that his tests were made in the shelter of rooms, and therefore prove nothing as to how the mixed cements would withstand the influence of changes of temperature; and, moreover, that the tensile strengths alone do not settle the question how a mixed cement will turn out when used for ornamental work, for *béton*, artificial stone-work, and so on."

The motives which have guided the Association in its resolution against the addition of foreign materials to cements do not touch the question how far such additions change the quality of cements. "Our motives are based on the principle that it is contrary to justice, that it is dishonourable to abuse the name 'Portland cement' by applying it to every arbitrary compound. We have in view the consequences which must arise in practice from a system of manufacture which opens wide the doors to fraud. The Association, of course, has neither the right nor the power to prevent the practice of mixing up other materials with cement. The Association is well aware that such admixtures can be made without needing any special cement manufactories for this purpose; but the Association is also of opinion that the mechanical addition of foreign ingredients should be left to the purchasers and users of cement themselves. Further, the Association holds that purchasers will, in most cases, do well if, instead of adding slag, chalk, or limestone, they would employ pure Portland cement, and, when they do make any additions to it, should confine themselves to sand. By its resolution the Association only wishes to urge on those firms who persist in making additions to their cement, the duty of avoiding the use of the term "Portland cement," as it can only serve the purpose of deception when they sell their mixtures of slag, chalk, limestone, tarrace, or what not, as genuine Portland cement."

A LUXEMBURG STATUE.

The authorities of the city of Luxemburg, the capital of the Grand Duchy of Luxemburg, decided some time back to erect an equestrian statue in honour of William II., the Dutch King and Grand Duke of Luxemburg, who in 1841 voluntarily granted the population of the little State the blessings of Constitutional Government. Up to a comparatively recent period the city was enclosed in strong fortifications, but these have now been done away with, since it was determined that the Duchy should be made neutral territory. Side by side with the removal of the ramparts and forts of the old fortress, the city has been undergoing great architectural improvement and embellishment, the adornment of the numerous open squares or places with artistic monuments being part of the scheme. For the statue of William II., who may be remembered by readers of English history as having served under Wellington in the Peninsula, the Luxemburg authorities did not open a general competition, but decided to invite the following five sculptors to send in designs:—M. Ch. van der Stappen, of Brussels; M. A. Mercié and M. A. Cain, of Paris; Herr Hundrieser, of Berlin; and M. Ch. Pètre, of Nancy, the last of whom is the sculptor of the fine bronze statue of the Princess Amalie of Saxe-Weimar, wife of Prince Henry, the deceased Stadtholder of Luxemburg, which is already erected in the city. The five models of these artists have been for some time on exhibition in the Town-hall of Luxemburg, and, according to the unanimous verdict of the critics, are all remarkably fine works of art. The jury to whom was entrusted the task of selecting one of these designs for execution consisted of the following gentlemen:—M. Eyschen, of Luxemburg, Minister of Justice, as representative of the Grand Ducal Government, chairman; M. Tony Dutreux, Deputy, vice-chairman; M. Canelier, and M. L. Gérôme, both sculptors, and members of the Institute, Paris; M. Auguste Marc, editor of *L'Illustration*, Paris; M. E. Portals, director of the Academy of Fine Arts, Brussels; and Professor Schaper, sculptor, Berlin. On the 25th ult. this jury met to adjucate on the designs, and by a unanimous vote selected the model of M. A. Mercié, of Paris, for the first prize, and recommended that with certain changes they indicated this design should be carried out.

THE TELEPHONE AND UNDERGROUND CABLES.

An interesting series of experiments has recently been carried out with the telephone through the subterranean telegraph cable between the two cities of Cologne and Elberfeld in Germany. The experiments were conducted at the instance and by the *employés* of the well-known firm of Messrs. Felten & Guillaume. For a long time it was found impossible to use underground lines for telephonic purposes owing to the disturbances occasioned by the phenomena of induction. Many attempts had been made to overcome this difficulty, but in no case had the success been complete. By theoretical considerations the firm above mentioned had arrived at a contrivance by which they believed all the obstacles hitherto experienced from the induction currents would be overcome, and they obtained permission from the German Imperial Post-office to put their ideas to the test upon the Cologne and Elberfeld cable, which is 52 kilomètres, or about 32 English miles in length. The result has been completely to prove the correctness of the theory upon which Messrs. Felten & Guillaume proceeded. Hitherto, owing to the sensitiveness of the telephone, it had been found difficult to speak on one wire when another wire was at the same time being used. Moreover, the sound conveyed by a given wire could also be heard through others. By help of a new contrivance invented by the firm above mentioned it was found, throughout the experiments between Cologne and Elberfeld, that the obstacles arising from induction entirely disappeared. A conversation could be carried on upon one wire while other wires in the same cable were being used for telephonic or telegraphic purposes. The experiments have conclusively proved that, by help of the new system, a subterranean cable may be employed at the same time both for telegraphing and speaking, and thus it has been shown that towns at great distances from each other may be brought into telephonic communication.

OBITUARY.

Mr. Sibley.—The death of Mr. R. L. Sibley, of Great Ormond-street, is announced. Mr. Sibley was District Surveyor of Clerkenwell, to which district he was appointed by the Justices in 1849, and to this district the Metropolitan Board recently added a portion of Islington parish. The gross value of the district was returned last year at 460*l*. Mr. Sibley was a Fellow of the Royal Institute of British Architects, and sixty-three years of age.

Mr. J. W. Holland.—The death is announced of Mr. James William Holland, architect, Newmarket. He was employed in conjunction with Mr. Clark in designing race-stands at Newmarket, Alexandra Park, and elsewhere, and also designed and completed Falmouth House for Mr. Fred. Archer.

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THE GENIUS OF SIR CHRISTOPHER WREN.

HAVING expressed an opinion of Wren's steeples that some may not be inclined to agree with, I beg to add a few remarks in further illustration and support of it.

These structures are beautiful as elements wrought, along with others of their kind and the grand unifying form of St. Paul's, into the texture of the general aspect of the City; and valuable for their picturesque and elevating effect upon it; and, with the enchantments of distance and association, must be touching objects to the citizens, more especially those who have gazed upon them from infancy. Such objects breaking the skyline of a city are to it what lofty trees, rising above the underwood, are to the country, and are felt by all to be equally life-giving. The spirit of poetry dwells among them no less than in the woods, and its voice in some degree

> "Re-measures
> Whatever tones and melancholy pleasures
> The things of nature utter."

Wren's steeples, though comparatively juvenile, being some of them scarcely two centuries old, are not without historic interest; having looked out upon the human tide that owned the sway of the "Good Queen Anne," and overshadowed the homes and haunts of the Addisons and Steeles, and the scenes of our old acquaintances, Sir Roger de Coverley and Will Honeycomb, cannot be uninteresting to any who think or feel.

But this is by no means a proof of their being of a very high and unapproachable order of merit. Only one of them, that of St. Mary-le-Bow, can be considered a successful example of the application of the Italo-Classic elements to that species of structure. This is graceful in outline, and a truly charming and artistic composition. But the remarkable falling off of the rest in point of merit, which none will deny, and for which falling-off of funds will not account,—a fact, to which I called attention in the *Builder* just thirty years ago,*—justifies the suspicion that Bow steeple was more the outcome of geometry than of artistic genius; for had it been the fruit of inventive power in himself, that power would certainly have shown itself again in the others, which, judged by his own standard in St. Mary-le-Bow's, are found wanting. By this standard chiefly I would now test them, on something like the principle of trial by jury.

The great diversity of Wren's steeples is often the subject of praise. But it arises in some measure, I fancy, from their great inequality in point of merit; and, in that well-known published family group of them, in which Bow steeple always strikes by its graceful proportions and poetic air, though there is a strong family likeness running through them, some are very poor relations indeed.

Perhaps the best, after Bow steeple, is St. Bride's, which, though graceful in outline, is certainly a monotonous and puerile composition, too much reminiscent of certain corresponding erections of the Chinese. The most admired after St. Bride's, I believe, are those of St. James's, Garlick-hill, St. Vedast's, Christ Church, and St. Botolph's.

The proportion which exists between the lantern and tower of St. James's, Garlick-hill, is condemned by the example of St. Mary-le-Bow, and that of nearly all the others, and, I believe, justly; and while no one of the other towers would be complete in itself if stripped of its surmounting features, this tower of St. James's would be perfectly so without its lantern, for which it was not prepared, and would gain in dignity by throwing it off. The lantern is merely an ornamental capping to the tower, and not an essential feature.

St. Vedast's steeple, though in its design unusual means were resorted to to make it graceful, the adoption of a four concave-sided plan is by no means graceful. Each separate stage of its lantern is ingeniously composed, but it has no harmony of form: the convex dwarf order between the concave order below it and the concave spire above it, which is surely a mistake, could only produce discordancy. Moreover, the four-sided spire is one of the clumsiest of spires.

Christ Church steeple is satisfactory up to the segmental pediment which crowns the first columnar story; but, above that, the law which requires in a work of art the utmost variety consistent with unity, and which is fully obeyed in Bow steeple, demanded a change to an octangular or circular plan, instead of the monotonous repetition of the lower square order.

St. Botolph's, Bishopsgate, is less faulty than many others, but a very homely unaspiring pile,—of the earth, earthly.

St. Dunstan's-in-the-East, which demands a passing notice, is not beautiful artistically, but, like the toad, ugly and venomous, it wears yet the precious jewel in its head of scientific beauty; which may be said also of its prototype at Newcastle-upon-Tyne.

Compare these for beauty and merit of design with some of the corresponding features of the Gothic churches at home and abroad, premising that the columns and other cylindrical forms of the Classic style give a greater brilliancy than square or octagonal buttresses, since there must always be a line of high light on them, and they more naturally assume the open, bower-like disposition and character befitting their aërial position.

It is but just to Wren to say that his pupils and successors have done but little to throw them into the shade, either in London, Edinburgh, or elsewhere, and this is one cause of their maintaining their first reputation. Of Hawkesmoor's works, St. Mary Woolnoth and St. George's, Bloomsbury, merely show that their author had, like Vanbrugh, the courage to go alone; while the steeples of Gibbs, though he had opportunities second only to Wren's, show not even that, let alone invention or strong feeling. His steeple of St. Martin's-in-the-Fields is stately and harmonious in form, but lacking relief; it is inferior in merit to St. Bride's, and seems little more than a prose translation, if I may so figure it, of St. Mary-le-Bow. St. Mary's-in-the-Strand is equally lifeless.

Steeples followed these before and during the Greek mania both in the metropolis and the provinces, which, if not more inanimate and prosaic, may be characterised as, to make a metaphorical application of Pope's lines,—

> "So sublimely bad,
> They were not poetry, but prose run mad."

The great desideratum in most of these structures is mysterious nooks and deep-shadowed recesses that the eye cannot penetrate, and which are therefore so exciting to the imagination. Nothing will so well secure these as the porticos and peristyles and chambers which, though to some people meaningless up in the air, are to the susceptible invaluable as fields in which the imagination, seeing there more than meets the eye, delights to wander.

The fact is, this class of structures is in its infancy, and presents scope for all but infinite variety and beauty of design. It opens a field in which art may become an enchantress,—a creator of romance in stone, wherein architecture's highest elements,—domes, arches, columns,—may be carried to the utmost perfection, and reach their most beautiful combinations, involving both subtilty of thought and delicacy of feeling.

It is evident that the aërial and prominent position and object of a structure, rising above the general skyline of a city, to be the observed of all observers for ever, and the cynosure of neighbouring eyes; whether to bear aloft the metal tongue of time, and—

> "Give it thus a voice
> As if an angel spoke;"

or to be the finger of Religion pointing to its hope and home on high, demand for it a high degree of beauty,—that in it should be found, if anywhere, the poetry of architecture, its brightest visions, its ideal of grace and beauty. There is nothing in the nature of Protestantism, no lack of inspiration or opportunity, to militate against this. The doctrines of the Protestant churches have not, it is true, enriched painting and sculpture with the graceful and majestic forms bestowed on them by Catholicism, and this renders them less able to adorn her sanctuaries generally. But in the feature in question architecture is sufficiently independent of sculpture and painting, and, with only carving or the lower forms of sculpture, has opportunity of embodying visions of architectural beauty as bright as ever dawned on Mediævalist's mind.

Wren, no doubt, felt all this, and if he did not succeed in all his examples, still, to him is due the merit of having opened this rich field of design in Anglo-Classic architecture.

I should not have gone into the subject of design of a class of structures now, through the disuse of the style in ecclesiastical edifices, seldom or never called for, but for a cherished belief that the style will one day be reinstated in its ecclesiastical office, not to the exclusion of its rival, but jointly with it; which it might claim as being the elder servant of Christianity. Its effect on the general character of our towns could only be a favourable one, as the Classic churches being more in harmony with the dwellings than the Gothic ones, would serve as links between them.

But whatever its style, the steeple may be made beautiful; and there are considerations which would induce me to advocate its universal employment.

Every Mahommedan mosque has, I believe, its accompanying minarette, generally a most solemn and graceful object; and it would be well if every place of Christian worship whether Gothic or Classic, down to the smallest Dissenters' chapel, had a steeple, which, being of no use, in the vulgar acceptation of the term, as to exhale smoke or foul air, would be an acknowledgment of something above the present life, and of that instinctive yearning for a better, of which no human creature, perhaps, is wholly unconscious, and a standing protest against the materialism of the age which calls for the efforts of art and poetry as auxiliaries of religion, to preserve men from sinking under its sensualising influence. A numerous array of these structures in one of our great commercial or manufacturing towns would be like a show of hands as votes in favour of the immortality of man. They would tend to mitigate its hard, harsh, utilitarian aspect and character; put the spiritual stamp on it; and make the whole, in some sort, to sympathise with the devout and grateful heart. Viewed in this light, steeples can never grow obsolete.

If beautiful architecture has an educational function in the exertion of a refining and elevating influence on the mind and heart, its lofty position in these structures would obviously give it immense advantage, a greater leverage, if I may so speak, in performing that function, which is needful, I believe, to indemnify the dweller in towns, who sees nothing of nature but the sky, for the absence of the beautiful scenery of the country.

One more use of steeples I would mention. So susceptive of interest are they from their aërial position and possible beauty, and their high and holy uses, that if full advantage were taken of it they would go far to render architecture as popular as any other of the fine arts; and not only vindicate the right and title of its professors to the name of artist against the cavilling of envy or ignorance, but cause them to be looked upon by the public with reverence. Architecture, like Wisdom, is justified of her children.

But, to return to Wren: I should be sorry to hear of the disappearance of his steeples through the demolition or removal of the churches they adorn, than which nothing would disfigure or disenchant the City more. But the sooner they cease to be pointed to as standards of perfection and models for all future structures of their kind, the better for the study and progress of architecture. But this fact, if it be one, does not dim the glory of Sir Christopher Wren, but only shows that he was not, like Leonardo da Vinci, a universal genius. He was as great an architect as any man of the highest scientific endowments, without the highest development of the art-faculties also, could be; and only failed where Newton himself, for aught that appears to the contrary, would have failed likewise. Men of universal genius, like the wonderful man just named, or like Goethe, who was scarcely less distinguished for his discoveries in science than for his creations in art and literature, are exceedingly rare.

The fact that Wren's art-genius did not manifest itself when it was most likely to do so, in youth, but, on the contrary, a precociousness of intellect in the direction of exact science which made him a prodigy of philosophy and mathematics at the age of sixteen, shows that the bent of his genius was decidedly mathematical and philosophical. Scarcely less, it seems to me, was the determination towards science in his case than in the celebrated one of Paschal. As in the case of that "Sublime Spirit," science seems to have smiled upon his birth and marked him for her own. Astronomy, mechanics, pneumatics, gnomics, even anatomy, visited him before architecture, and this came not by invitation; and his ability in architecture was not developed till a tremendous calamity (the Great Fire) [illegible] him opportunities for its display that do[illegible]vice in a thousand years.

* *Builder*, vol. x. (for 1852), p. 733.

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But everything proves that his scientific faculties were of the very highest order; and though his celebrity as an architect has thrown into the shade his scientific distinction, it appears to me more than probable that had he devoted his life exclusively to science his fame would at this hour be greater than his combined scientific and architectural achievements have made it; that he would have been even a brighter and more peculiar star in the galaxy of scientific men of his time than he was; and, perchance, have anticipated Newton and Leibnitz in some of their greatest discoveries.

He had, however, on the other hand, the satisfaction of having cultivated the whole of his nature, and so brought himself into contact with the universe at all points, a course which must be favourable to mental sanity; and was, perhaps, a better and happier man for having strayed into the fold of art. This will appear the more probable if we consider that in the pursuit of science the emotional part of our nature is far less cultivated than in that of art, which must be prejudicial to the mind of the exclusively scientific, since from the emotional region spring the great moral virtues, as gentleness, temperance, fortitude, justice. This is one of the advantages of art over science. SAMUEL HUGGINS.

THE OPENING *CONVERSAZIONE* OF THE ARCHITECTURAL ASSOCIATION.

SESSION 1882-83 of the Architectural Association was commenced on Friday evening, the 27th ult., when the usual *conversazione* was held, the visitors being received by the President, Mr. Edward G. Hayes, who subsequently distributed the prizes to the successful students of last session.

The Association Travelling Studentship. — Awarded in May last to Mr. W. A. Pite, whose excellent drawings made in the course of his tour were exhibited on the walls of the Institute meeting-room. A second prize of the value of 5*l.* was now presented to Mr. F. H. Tullock, and honourable mention was made of the work submitted in the same competition by Mr. A. S. Haynes.

The Association Medal was presented to Mr. George W. Ward for the best design for a building to be let out as offices.

The Architectural Union Company's Prize (value 5*l.*) was awarded to Mr. John E. Newberry, for measured drawings of portions of Wells Cathedral.

Class of Design Prizes, for the best series of sketches submitted in the class during the past session, awarded to Messrs. G. W. Miller and J. G. Sankey, bracketed as equal. Honourable mention made of the sketches submitted by Messrs. T. E. Pryce and C. Wilson.

Elementary Class of Design.—First prize awarded to Mr. G. G. Woodward; second prize, to Mr. A. C. Houston. Honourable mention made of Messrs. W. A. Webb and G. H. Oakley.

Colour Decoration Class.—Prize, value three guineas, awarded to Mr. S. R. J. Smith. Honourable mention made of Mr. C. T. Coggin.

Class of Construction Prizes, for the best series of papers submitted at the meetings of the class:—First, Mr. A. H. Gausden; second, Mr. A. C. Houston; honourable mention of Mr. L. Hunt.

Class for the Study of Planning and Specification Writing.—First prize to Mr. A. S. Gover; second prize divided between Messrs. C. G. Killmister and W. J. Lander.

The President then delivered a brief address. He observed that the Association had now reached the fortieth year of its existence. For the first few years it had a somewhat different title,* but its present name was adopted in 1847. Since that time the history of the Association, judging by the work it had done and the number of members upon the list, had been one of continued and increasing prosperity. During the past ten years the number of members had nearly doubled itself, as in 1872 there were about 500, and now there were almost 1,000. The Association had always been less exclusive in admitting members than the Institute, and rightly so, being a society the members of which were associated together for purposes of study and mutual improvement. The Association admitted to membership not only those who were engaged professionally in the study and practice of architecture, but gentlemen interested in the arts or sciences associated therewith. The reason for such latitude was obvious. The knowledge required in an architect's practice is varied in its character and very extensive in its range, and it is, of course, desirable for the architectural student to acquire all the information he possibly can in the various branches of his profession. The Association endeavoured, as far as possible, to give students an opportunity of studying in common any such subjects as their inclination or previous training might have rendered it desirable for them to pursue. With this end in view, the Association had now in full working order classes for the study of construction, design, planning and specification writing, surveying and levelling, decoration, and various other subjects. In addition to papers read at the fortnightly general meetings, the Association had also established courses of lectures in connexion with some of the classes, one of the primary objects of these lectures being to put students in the right course to be pursued by all who intended to enter the Royal Institute of British Architects. The Association also possesses an excellent lending library, containing some 1,200 volumes,—largely used and greatly appreciated by its members. It should be recollected that the work of the Association was all voluntary. All its officers were honorary, and the classes were carried on upon principles of mutual help, with the assistance and guidance of some of the older and more experienced members of the profession, which was always freely given, regularly and systematically, when required. There could be no doubt that the Association supplied a very great want in the profession, and afforded to many men opportunities of study which they would not otherwise have. What, it might be asked, was the necessity for so much voluntary effort to assist the architectural student in his training? That necessity existed in the fact that it was found practically impossible for a pupil to acquire as much information as he might, and should, desire during the short term he spends in an architect's office; and although he could supplement his office training by becoming a student in the School of Architecture at the Royal Academy, or by going through a diligent course of study in connexion with the lectures at the London University or King's College, but there was a very large number of architectural students who, from different causes, were unable to avail themselves of either of these means, and it was for them that the Association specially catered. We were rather in the habit in this country of drawing comparisons with our neighbours over the water, and of saying "They do these things better in France." The School of Fine Arts in Paris was a national institution, consisting of about 270 painters, 140 sculptors, and 570 architects, and it now had an annual subsidy from the Government of about 12,000*l.* A course of study in this school was the recognised mode of training adopted by French architects. The students passed through an elaborate and systematic course of study under duly appointed professors. In Paris, the paternal Government not only brought up the young architect in the way it thought he ought to go, but when he was let out into the world it looked after him, and, by means of very stringent rules and regulations, carefully and systematically enforced, it ensured that he should not go very far astray from the appointed paths. Hence all that uniformity in height and general effect which produced in the minds of some persons, especially when seen for the first time, a feeling of admiration, and a tendency to draw comparisons with our own streets by no means flattering to the latter. Such first impressions, however, were not very lasting, for the mind became wearied with the monotony of the long façades and the almost unbroken skylines. Here in England, on the other hand, the young architect had no such systematic training, nor when he commenced to practise was he confined by any such stringent regulations as to height or uniformity in general effect. The result of this freedom was seen in the variety of design and colour in the buildings which were being put up in our leading thoroughfares, and which, in spite of occasional eccentricity, imparted to our streets an interest which was entirely wanting under the French system. Several events of importance had taken place in the architectural world during the past year. It was his sad duty to add his small tribute of praise to the memory of George Edmund Street, who died in December of last year. Mr. Street's talents were so universally admired that it was unnecessary to dilate upon them. Any one who examined carefully his last and greatest work,—the Royal Courts of Justice,—which he was not permitted to see completed, could but be struck with the infinite variety in design and beauty in detail which met the eye in every part of the vast building. It was evidently the work of a master mind and hand, and one upon which that mind and hand had lavished a wealth of thought and care. Another event of considerable importance to the profession was the institution of an Examination for all those who might now be desirous of entering the ranks of the Royal Institute of British Architects. It was to be hoped that in course of time that examination would be firmly established, and that it would be considered a necessary qualification for all who might be desirous of practising in this country as architects. Hitherto, unfortunately, nothing of the kind had been necessary, and the result had been that the profession had frequently suffered severely in being misrepresented by untrained and unsuitable practitioners. Considering the importance of the interests frequently involved in an architect's practice, and the extent of the knowledge required to produce at all satisfactory results, it could not be doubted that the step which the Institute had taken was a most important one, and one in the right direction. The subject of architectural competitions had received a very large amount of consideration during the past session, but no very satisfactory conclusions had been arrived at. The objects to be attained were to frame such rules and regulations for the conduct of competitions as would obtain the approval and adherence of the profession generally, and to persuade the public in all cases to adopt such rules. Architects did not want to discourage competitions, but what they did want was to have the instructions clearly framed by an expert; to be satisfied that the requirements laid down would be strictly adhered to in every respect; and that the final selection if possible (or, if not, the selection of some small number) shall be made by a professional assessor whose position and qualification shall be such as to command respect. Another great object that architects had in view in discussing the question was to reduce, as far as possible, the amount of work to be done. In these days, when the promoters of nearly every building enterprise, small or large, must have a competition, and when so many architects were found to send in designs for anything upon almost any terms,* it behoved those who had the interests of the profession at heart to make a decided stand. The matter was really in their own hands. If architects could only be got to agree as to the terms and conditions upon which competitions should be conducted, and to agree, further, not to compete unless upon such conditions, the committees and boards (who desired, in most cases, to act fairly and honourably) would no doubt be generally ready to adopt such leading principles as might be laid down. Passing on to glance at the present state of the art of architecture, the President observed that the Association might justly claim to have exercised considerable influence in guiding the tastes and supplying the wants of the public. Architects were often told by their critics that they had no style of their own in this nineteenth century, and that they were mere copyists. The first part of the statement was, no doubt, true, but he was rather disposed to adopt the opinion of those who thought that a new and distinct style of architecture was an impossibility. For what was called style was a combination in the masses and voids, and in the details and ornament, of certain well-known and distinctive forms; and if it was a fact,—as most of them believed,—that those forms had in past ages been well-nigh exhausted, the best thing they could do was what they were doing now, viz., to adopt such a period of work as they or their clients might consider best suited for the purpose, and to design their buildings in accordance therewith. The present century had witnessed the revival of Gothic architecture, and the old work had been studied and measured and sketched until its spirit had been thoroughly acquired, and buildings of all kinds had been

* The history of the Association was very fully treated of in a series of letters which appeared in the *Builder* two or three years ago.

* An apt illustration of Mr. Hayes's remarks reaches us in the shape of the following advertisement, clipped from a recent number of the *Manchester Guardian*:—"Architectural Plans, Detailed Drawings, Gratis. Address"——

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erected, carrying on the tradition and feeling of the style in a most perfect way, and in a manner which could no more be said to be a copying of the old work than one building of the twelfth century could be said to be copied from another of the same date. The Gothic work of different periods thus revived still continued, and probably would continue, to be used for all ecclesiastical work, and it would almost seem to have been developed in new ways in consequence of the introduction of new materials. But it was questionable whether this century would see many more secular buildings of importance erected in the Gothic style. The kind of work which was now commonly known as "Queen Anne," but which included a great variety of features both English and foreign which were in use before and after that sovereign's reign, had given scope to great originality of idea. It had been found very suitable for all kinds of secular building, and seemed likely to hold its own for some time to come. We had also seen erected recently some few buildings in which Late Gothic features with Classic details were used, and it was still open to architects to adopt more largely than hitherto mixtures in the art of architecture. The current of thought in the architectural world had been at times somewhat slow and sluggish, but now it appeared to be full of life and energy. They, the younger members of the profession, were doing their best to maintain that life,—to breathe into their designs that nameless spirit of beauty which should pervade every architectural work, and which was necessary to raise it above the sphere of mere building. They were stimulated in their exertions by the consciousness that they were devoting their energies to a noble study,—that they were following one of the few callings in life which were worth doing for their own sake alone, and by the recollection of the enduring character of their work.

Mr. Rickman said it was now some twenty-eight years ago since he had the honour of filling the chair of the Association, and he was very pleased to hear the present President uttering very much the same sentiments, in very much the same words, as were uttered by him (the speaker) and by others, a long time ago. He felt at that time, and he was glad to perceive that the Association still felt, that its business was that of a younger society,—of a society of students of architecture,—just as the business of the elder society was that of a society of practitioners of architecture. He was exceedingly pleased to find that the class of young men who were now coming forward as students had such excellent opportunities of which to avail themselves, and he felt assured that the Association would continue to do its work in a satisfactory manner during the coming year.

Mr. J. B. Fraser, president of the Leeds Architectural Society, said it gave him great pleasure to be present, and to be informed of the valuable work which was being done by the Association. Architectural societies in the provinces looked upon the Association as taking the lead in all matters connected with the educational work of the profession, and as being entitled to a very large share of the credit of what had been done of late years for the advancement of the *status* of the profession.

Mr. William White, F.S.A., proposed a vote of thanks to the President for his address. Among the several points which it had touched upon was a reference to the lamented death of Mr. Street,—one of his (the speaker's) oldest and dearest friends. It was some thirty years ago since he was associated with Mr. Street in offering some suggestions for the formation of an Architectural College,—suggestions which would be most properly carried out now if they could be, although the Association had to a very great extent covered the ground which the college, as at first proposed, was designed to cover. They wrote to three men very highly distinguished in the profession at the time, and received most kind and cordial replies from them, but the time had not arrived for carrying the proposal into execution, and it fell through. Another point of interest to which the President had alluded was the possibility of the development of a new style. He (the speaker) did not think it impossible that a new style should be developed, but he was quite positive that a new style could never be developed without the very scrupulous adhesion of the large body of educated architects to some definite lines or principles of design. But the Architectural Association was animated by the same conviction, and the greatest benefits would accrue both to the profession and the public from the systematic teaching of the Association's classes for design. He had always strongly deprecated eclecticism, which was too generally interpreted to mean that the architect, having the whole world of architectural art to choose from, should be at liberty to pick out the tit-bits of each style and to put them together,—of course, in an orderly and systematic manner.

Mr. John Norton briefly seconded the motion for a vote of thanks, which was carried, and thus terminated the formal part of the evening's proceedings.

Syllabus of Papers, &c., Session 1882-1883.

Nov. 10, 1882.—Address from the President. Mr. E. G. Hayes.
Nov. 24.—"Sundry Working Drawings." Mr. J. P. Seddon.
Dec. 8.—"Horticultural Buildings." Mr. F. A. Fawkes.
Jan. 5, 1883.—"Vaulting." Mr. W. H. Wood.
Jan. 19.—"The Ornament of the Period." Mr. Lewis F. Day.
Feb. 2.—"The Position of Choirs and Organs in Churches." Mr. H. W. Brewer.
Feb. 16.—"Secondary Schools." Mr. J. Sulman.
March 2.—"About Modern Design." Mr. J. D. Sedding.
March 16.—"Theatres." Mr. Walter Emden.
April 6.—"Italy." Mr. F. T. Baggallay.
April 20.—Members' *Soirée.*
May 4.—"Museums." Mr. J. Osborne Smith.
May 18.—"Some Notes on Professional Practice." Mr. A. J. Gale.
June 1.—"Rural Sanitary Authorities and their By-laws." Mr. H. D. Appleton.

THE TUILERIES.

In the approaching demolition of the Tuileries it has been decided to preserve and employ again certain portions of the materials as nearly as possible in the relative positions in which they have hitherto lain. The architect, M. Garnier, has been instructed to see that the blocks of masonry, the parts of the cornices, stone lintels, and hewn stones should be numbered and kept in order. After the demolition is completed it will be decided whether these materials shall be employed to erect a pavilion or some other small edifice in imitation of the architecture of the old Tuileries in memory of that ancient residence of the old kings of France. For ten years past there has been a great difference of opinion as to what should be done in this matter. The deceased M. Viollet-le-Duc thought that the large space between the Champs Élysées and the Garden of the Tuileries ought not to be left without some building upon it. Amongst the artists and architects of the French capital there is a strong desire to see a museum of the Nineteenth Century erected in that locality, and thus to substitute a temple of art for a monumental edifice, with which the names of Philibert de l'Orme, Jean Bullant, Jacques Androuet, Levan, and others are associated.

EXCAVATIONS IN THE FORUM AT ROME.

The excavations in the Forum and on the side of the Palatine Hill nearest to the Forum, have of late been carried on with unusual energy. The modern wall which cut off the Palatine on the north-eastern side has been pulled down, and the soil beneath and about it has been carried away down to the level of classical times. By this means extensive substructures have been laid bare that belonged to the Palace of Caligula, and a row of small private houses has been discovered which formed the boundary of the Forum on this side. The Italian Government is in negotiation with the Cardinal Vicar, with a view to the purchase of the adjacent Church of Sta. Maria Liberatrice, and there is good reason to believe that it will be successful. The church in question stands on the site of the buildings once belonging to the shrine of Vesta. The ground there has never yet been disturbed, and accordingly the excavations that are intended to be carried out there can hardly fail to lead to discoveries of interest, and bring to light important relics connected with the worship of Vesta.

The project of connecting the Forum and Palatine in their entire extent by systematic excavations is the grandest scheme of the kind ever attempted in Rome, and the present Minister of Education, Signor Baccelli, merits the applause of all civilised peoples for the resolution he has displayed in persisting, in spite of much violent and often very personal opposition, in carrying out the idea in its entirety. The proposals, on the other hand, which have been made by the municipal authorities, with a view to provide the means of communication across the site are almost enough to take an archæologist's breath away. The suggestion is to throw an iron bridge over the Forum from the Piazetta di S. Teodoro in the direction of the Faustina Temple. One can hardly imagine anything more incongruous than a modern structure of that sort among the classic relics of the Forum. It is to be hoped that the Italian Government will feel how monstrous an absurdity it would be to carry out such a scheme, and that Signor Baccelli's energy will succeed in preventing the Municipality from proceeding to its realisation.

An interesting discovery has already been made in the course of the excavations. In removing the causeway passing across the area in front of the Arch of Septimius Severus the remains of an ancient and forgotten church, now recognised as that of Santa Maria in Foro, have been found beneath the road. The church, which is of small size, was constructed within the western porticos of the Basilica Julia, and on the ancient level.

THE ASPHALEIA THEATRE IN VIENNA.

Speaking of the Asphaleia, or "safety," theatre in Vienna, Herr F. Brandt, who is manager of the stage-machinery at the Wagner Theatre at Bayreuth, delivers his opinion as follows:—The so-called Asphaleia Theatre at Vienna, the often-described model of fire-proof theatrical buildings, appears to be the work of an engineer devoted to hydraulic machinery,—of a man, in fact, who knows very little about theatres, and who understands nothing of the technical department of the stage. The application of hydraulics to theatrical machinery is a very unhappy thought. The most excellent water-pressure machines are not to be provided except at an immense cost, as they must be of the best materials; they also require to be moved and loaded in a uniform manner, but what is worst, they constantly stand in need of repair. How can we act with machines of this sort in the theatre where, during a single performance,—often, indeed, during a single act,—the same machine has to be employed three or four times with burdens and movements that are never uniform? Hydraulic machines are by far the least trustworthy we have. But on the stage, where everything depends on punctually doing what is wanted at the exact moment, and where there are a thousand accidents unknown to the non-professional man and invisible to the spectator, the only machines that are of any use are the simplest, the most trustworthy, and the least complicated. Let us only remember how soon the notion of employing steam for moving stage-machinery was abandoned, and how often, in the few attempts that were actually made with it, human life was endangered! Precisely similar is the case with hydraulics. It is one thing to construct a model of one-tenth the natural size, and on which three or four pieces of decoration have to be moved, and quite another thing to build and fit up a stage which will satisfy, not only the requirements of the current *repertoire*, but also be equal to any new scenic-technical tasks as they arise. All the pompous phrases that are employed,—such as "the immediate and unprepared opening and lowering of the entire podium or large parts of it at any moment, or setting the entire podium or certain sections in wave-like motion; raising and lowering of entire rooms by trap-doors or flaps running parallel to the side walls of the stage; the wonderful horizon which, in connexion with the often very difficult task of limiting the extent of the scene in an upward direction, is to render us entirely independent of soffits and arches,"—all such phrases can only raise a smile on the face of every really experienced stage painter or machinist. In models, such things are very easy to execute, but when carried out on a large scale they leave their inventor completely in the lurch. In certain special and exceptional cases such things may be and have been successfully applied. But to attempt to

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bring them into operation altogether as a complete system, is absurd and impossible, whether the motive power be hydraulics or steam or anything else. In a theatre so fitted, one would never be able to find at the right moment the proper piece of theatrical machinery through being overdone with machines. It is quite possible to erect fire-proof theatres without resorting to all these so-called practical, but really most unpractical, expedients.

THE CORINTH CANAL.

WHILE war has been raging on the banks of the canal that joins the Mediterranean and Red Seas, the spade has been busy on the Isthmus of Corinth, where the Greeks are engaged on a new and bold undertaking, which is destined one day to be the highway of commerce between the ports of the Ægean, Constantinople, and the Black Sea on the one hand, and all the States of the western half of the Mediterranean as well as of Western Europe generally, on the other. The work of excavating the new Corinth Canal, of which King George turned the first sod in the spring of the present year, is, according to the latest accounts, rapidly progressing. Within the past month additional hands have been taken on, and at present the number of navvies employed on the excavation is about 800. The work commenced on the 10th of April last, and up to the 15th of August the quantity of earth removed was a quarter of a million cubic mètres. New dredging-machines have been ordered, and are expected to arrive at Corinth in November, by the help of which the progress of the work will be vastly accelerated. At the two ends of the new Corinth Canal the first steps have already been taken in laying the foundations of the two new ports which the Greek Government has decided to establish there.

EDINBURGH.

A CONGREGATION in connexion with the Established Church, which at present occupies an iron church at Lorn-street, has succeeded in raising a building fund to enable them to erect a suitable permanent church. Plans, it appears, have been obtained from Messrs. Sloan & Balderston, the celebrated American church architects, and the carrying out of these is to be supervised by Mr. Thomson, architect, Leith. The architecture of the church, it is said, will embrace the principal features of the Gothic style. The frontage towards Lorn-street is to be octagonal, with three entrance-doorways, one in a tower at one side, one in a porch at the other side, and one in the centre. Besides these three entrances, there will be two in the rear. A circular arrangement has been adopted in the interior which will have a gallery of horse-shoe form. The area of the building will be 76 ft. square, and an open span-roof, without intersecting beams, will give an appearance of airy spaciousness. A commodious platform is provided for the preacher, and the vestry is placed behind it on the same level, the session-rooms, &c., being placed underneath. Above the centre vestibule space will be left for an organ-loft. The spire is intended to rise to a height of 200 ft., but it is not proposed to complete it at once. The estimated cost of the building is about 6,000*l*., and accommodation will be provided for 1,200 sitters. It may be mentioned that Messrs. Sloan & Balderston lately obtained the contract for the building of a palace for the Emperor of Mexico.

The foundations are in process of excavation for an addition to the Advocate's Library. The addition will consist of three stories, and be fitted up to contain about 100,000 volumes.

An influential committee has been formed for the purpose of erecting a monument to John Knox. A list of subscriptions to the amount of upwards of 1,200*l*. has been published, and should a sufficient amount be obtained it is intended to place as accessories, statues of Patrick Hamilton, George Wishart, George Buchanan, and Andrew Melville, one at each corner of the pedestal. The committee have secured as sculptor, Mr. D. W. Stevenson, A.R.S.A., whose embodiment of the Reformer, as represented in the published engraving, "has received a warm and universal approval." The monument is intended to be placed in the small square to the west of St. Giles's Cathedral. None of the designs submitted for the Wallace and Bruce Memorial have been deemed worthy of acceptance, and it is not yet decided what steps will be adopted to carry out the scheme.

After paying all expenses connected with the care of the public monuments in the city there remains a profit of 286*l*. 2s. 3d. for the year. From the accumulation of balances the Town Council have been able to expend 1,418*l*. 4s. 10d. on statues and statuettes, which have been placed in the niches of the Scott monument, while there still remains in hand a balance of 1,442*l*. 17s. 6d.

THE EVANS MEMORIAL CHAPEL.

HOME AND COLONIAL TRAINING COLLEGE, GRAY'S INN-ROAD.

A CHAPEL has been recently erected from the designs and under the superintendence of Messrs. Charles J. & C. Herbert Shoppee, architects, of 61, Doughty-street and 22, John-street, Bedford-row, London, W.C., on a site forming part of the exercising-grounds of the College. It is approached from an arched covered way serving as a cloister, and is intended as a memorial to the late Rev. J. J. Evans, M.A., for many years principal of the College. The foundation-stone was laid about five months since by the Right Hon. the Earl of Chichester, and the chapel was opened for divine service on Thursday, the 12th of October. Its architectural treatment is Romanesque, and its dimensions are 53 ft. in length by 22 ft. in width, with an aisle on the north side, 27 ft. by 9 ft.

Externally the chapel is partly faced with glazed white bricks and Box stone dressings relieved with blue bricks in courses, and covered with green slates and red ridge tiles.

On the stone tympanum over the entrance-doors the words "Holiness unto the Lord" are incised and the letters gilt.

The interior of the chapel is faced with white Suffolk bricks and string-courses and cornice of dark purple Luton bricks with Box stone quoins, jambs, and arches to the windows. The windows are glazed with tinted glass in geometrical patterns, in lead lights, by Messrs. Odell, of Bath-street, City-road. The arcade separating the aisle from the chapel is semicircular, and has moulded stone voussoirs and labels. The shafts are of polished red Aberdeen granite, with moulded stone bases and stone capitals, carved by Mr. Bradford, of Albert-street, Kennington-road. The roofs are of pitch pine, with moulded principals resting on Box stone corbels, and with moulded ribs and cornices. A pitch-pine dado, 5 ft. high, is fixed to the walls.

At the west end is a gallery with ornamental pitch pine front, and with separate access by stone staircase from the cloister. The reading-desk, entrance-doors, lobby, and seats are of pitch pine. The chapel is paved with Craven, Dunnill, & Co.'s geometrical tiles, with encaustic tiles at intervals. The gasfittings are of wrought-iron of Messrs. Gardner's manufacture. The chapel will be heated by hot water.

A brass memorial plate engraved by Gawthorp is fixed against the south wall.

Ample provision has been made for ventilation and the admission of fresh air.

The works have been well carried out by the builder, Mr. Henry Burman, of 37, De Laune-street, Kennington-road.

THE COURT-YARD "DE LAS DONCELLAS," SEVILLE PALACE.

"THE Alcázar of Seville," says Señor Don Pedro de Madrazo, in the eleventh volume of his *Recuerdos y Bellezas de España*, "is in great part a reproduction of the charms of the Alhambra, due to the same architects who constructed the magnificent palace of Granada. There are to be seen the precise copies of those beautiful traceries which adorn its doors and ceilings; those stalactite vaults which dazzle the eye and puzzle the mind; those mural decorations of elegant Byzantine twigs and geometrical twists which, even to this day, puzzle drawing-masters; those charming saloons, where the genius of harmony appears to predominate; those luxuriant gardens, which invite to rest, meditation, and solitude."

One of the marvels which captivate the attention of the visitor and the artist in the beautiful Alcázar of Seville is the principal inner courtyard, called "de las Doncellas," and also "del Trono del Tributo"; names derived from an unfounded tradition, according to which the Moorish kings received in this court the feudal tribute of the time due to the caliphs of Cordova, and consisting of a hundred maidens. This legend is contradicted, on the ground that Seville never was the capital of the Andalusian caliphate, and that there are no data justifying the conclusion that any Saracenic palace existed until the eleventh century.

The illustration which we give in this week's *Builder* represents one of the corners of this yard. It is a rectangle containing galleries supported on marble columns, arranged to match with each other, and embellished with arches in the Pointed style. On the frieze are shown trophies and shields with the arms of Don Pedro I. and of other kings, as well as the pillars of Hercules, with the motto, "Plus ultra," the design of which is attributed to Luis Marliano, physician to Charles V.

DESIGN FOR BIRKENHEAD TOWN-HALL.

THE design we illustrate, marked "Fide," and which was the third in order of merit, is by Mr. G. B. Rawcliffe, architect, Burnley, and Mr. E. P. Wright, surveyor, Plymouth. This design, although considerably richer in detail, is intended to harmonise with the surrounding building in Hamilton-square. The borough surveyor, borough treasurer, and town clerk occupy the principal floor, which is 8 ft. 6 in. above the street; the other officials, medical officer, school attendance officer, nuisance inspector, gas and water, &c., being located in the basement and top story.

The first floor is the municipal floor, with council-chamber in front centre; town council and mayoral apartments down each side, and a large public assembly-room in the rear. The four elevations were intended to be faced with Hollington stone, and the principal entrance, staircases, passages, &c., with Ancaster or Combe Down stone. The cost is estimated at 42,000*l*.

EAST SUSSEX, HASTINGS, AND ST. LEONARD'S INFIRMARY COMPETITION.

THE design submitted by Messrs. Higgs & Rudkin, of 68, Lincoln's-inn-fields, now illustrated, consists of a block of buildings covering nearly the whole site. It is only four stories in height. The basement is 4 ft. below the level of the Parade, and contains the kitchens, dispensary, waiting-room, heating-chamber, and mortuary, which is completely cut off from the main building. The central portion of the ground-floor is occupied by the administrative department; the right wing by the accident-ward for women; and the left by that for the men. This arrangement is followed on the upper floors. The wards contain an average of 1,200 cubic feet of air per head, and are each overlooked by a nurses' room. The ventilation is effected by means of Tobin's ventilating tubes and extracting-flues. The entrance-hall is situated in the centre of the building, and provided with double sets of swing-doors, protecting the main building from draught, the principal staircase being immediately opposite. There are also two secondary staircases for nurses and servants in direct communication with the wards, and four lifts (two in connexion with the kitchen, one with the dispensary and medical department, and the fourth for ambulance). The elevation, though inexpensive, is effective, being of red brick and terra-cotta; it is well broken up by the two end wings and a fine central tower.

The building will accommodate 100 patients, at an estimated cost of 20,000*l*.

Vandalism.—The village of Sawston, Cambridgeshire, is noted for a fine stem of an ancient cross of Barnack stone. Of late years the base has been damaged by children playing upon it. Last week, the parish authorities, who ought to be proud of this interesting relic, decided to utilise it by converting it into a lamp-post and fixing street-lamps thereon. It is to be hoped some public-spirited persons will invoke the aid of the Society for the Preservation of Ancient Monuments, or otherwise effectually prevent this gratuitous piece of ignorant vandalism.

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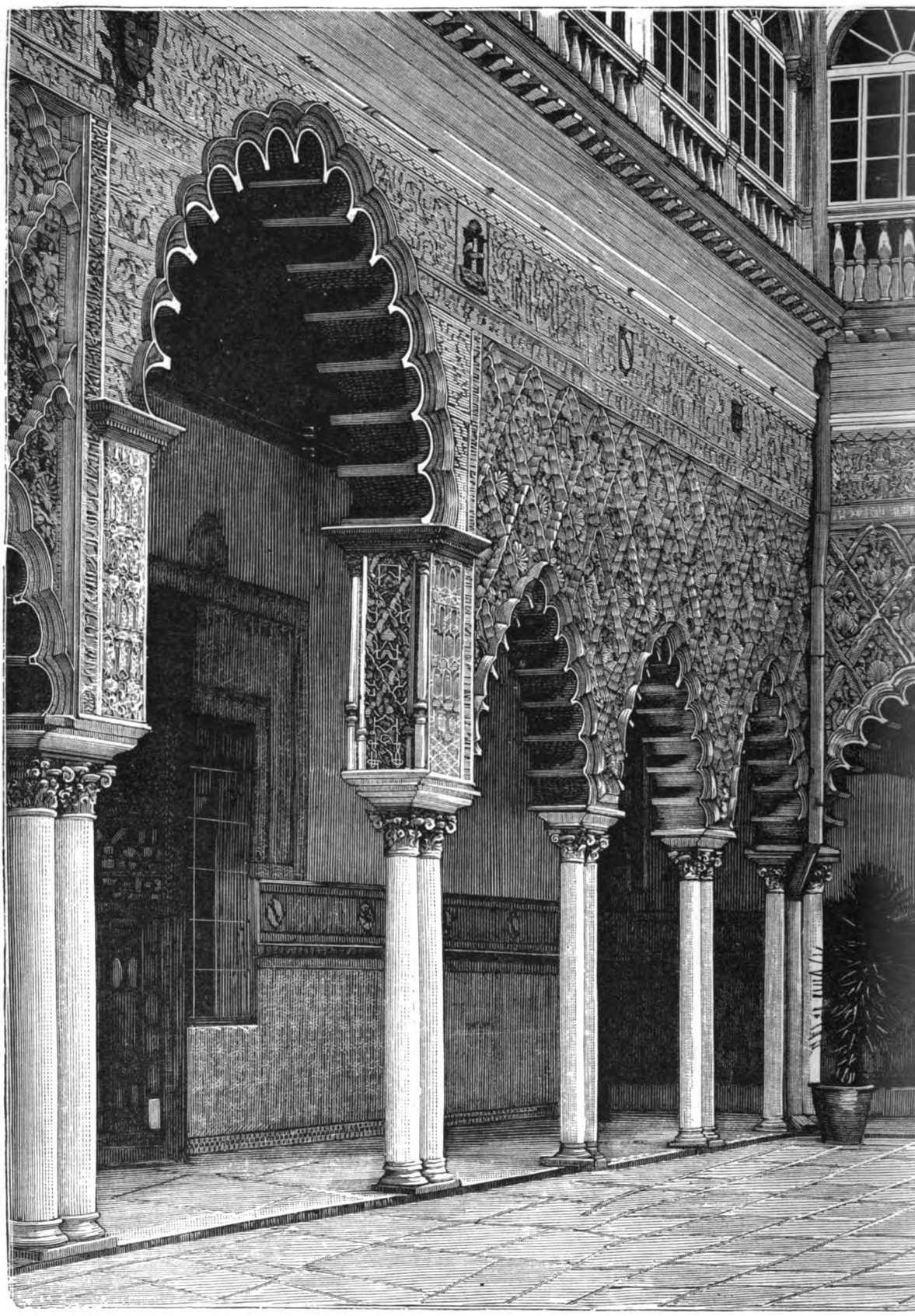

PATIO (COURT-YARD) DE LAS

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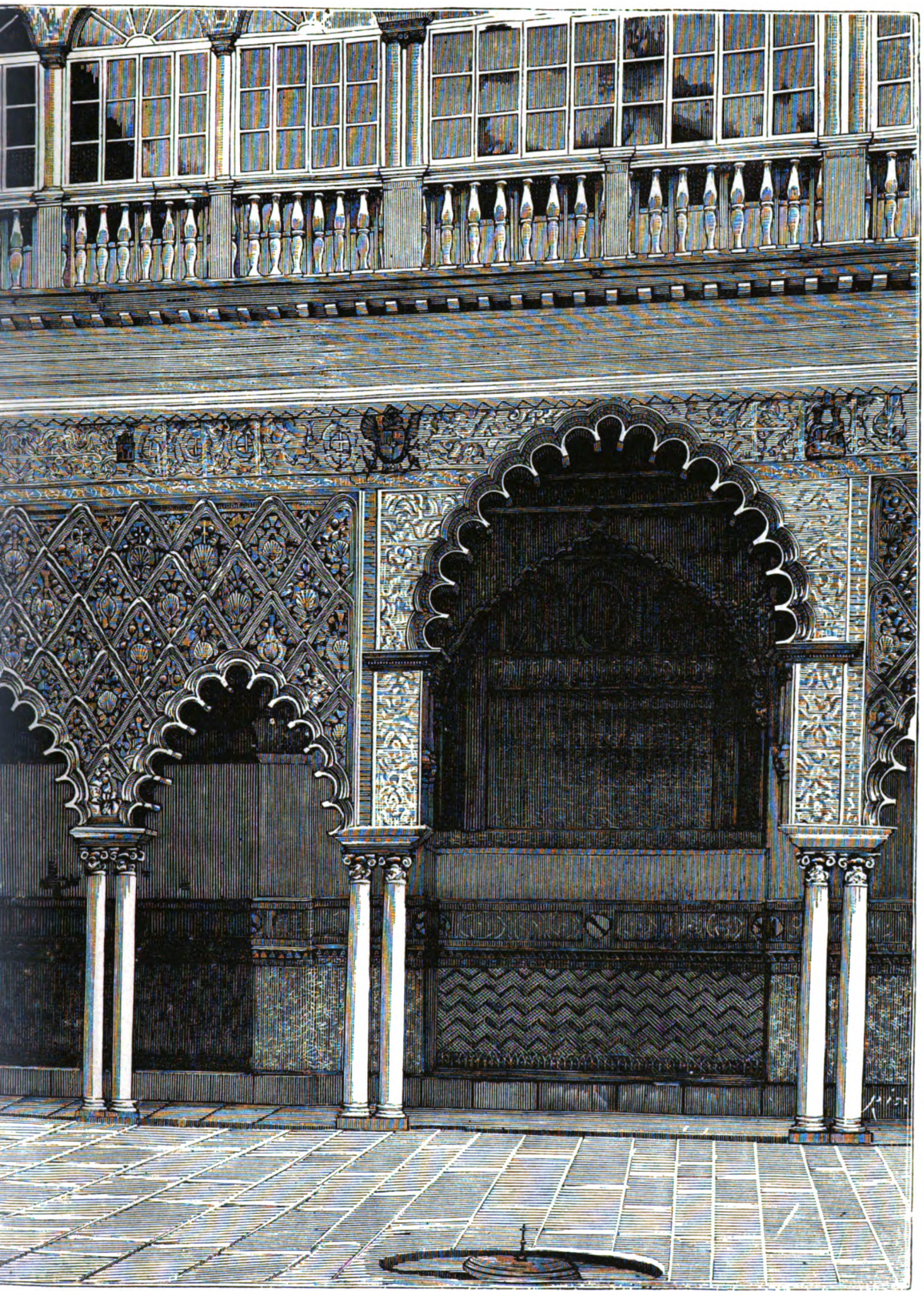

DONCELLAS, ALCÁZAR, SEVILLE.

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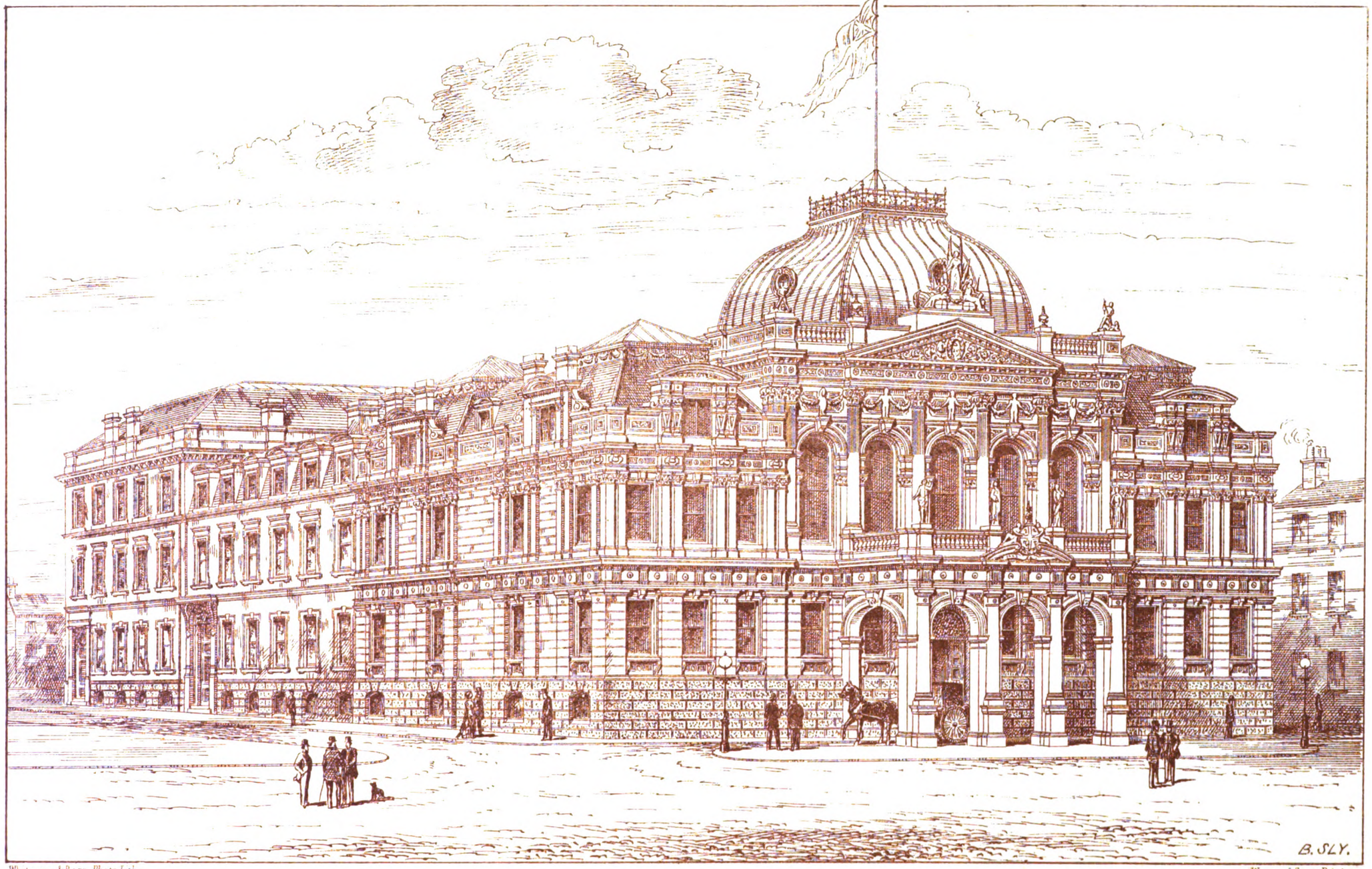

Whiteman & Bass, *Photo-Litho*

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DESIGN SUBMITTED FOR THE BIRKENHEAD TOWN-HALL.—Mr. G. B. Rawcliffe and Mr. E. P. Wright, Architects.

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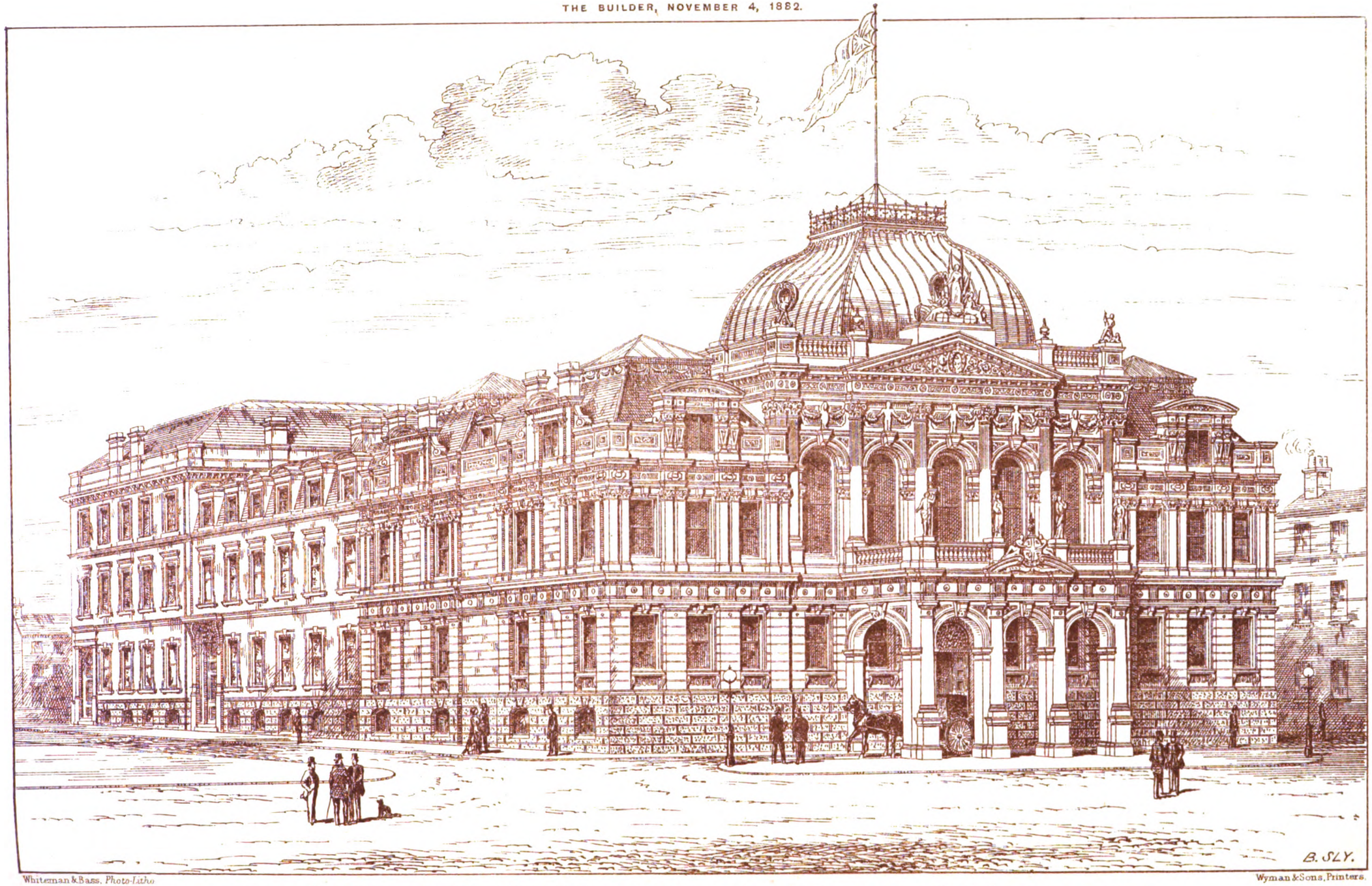

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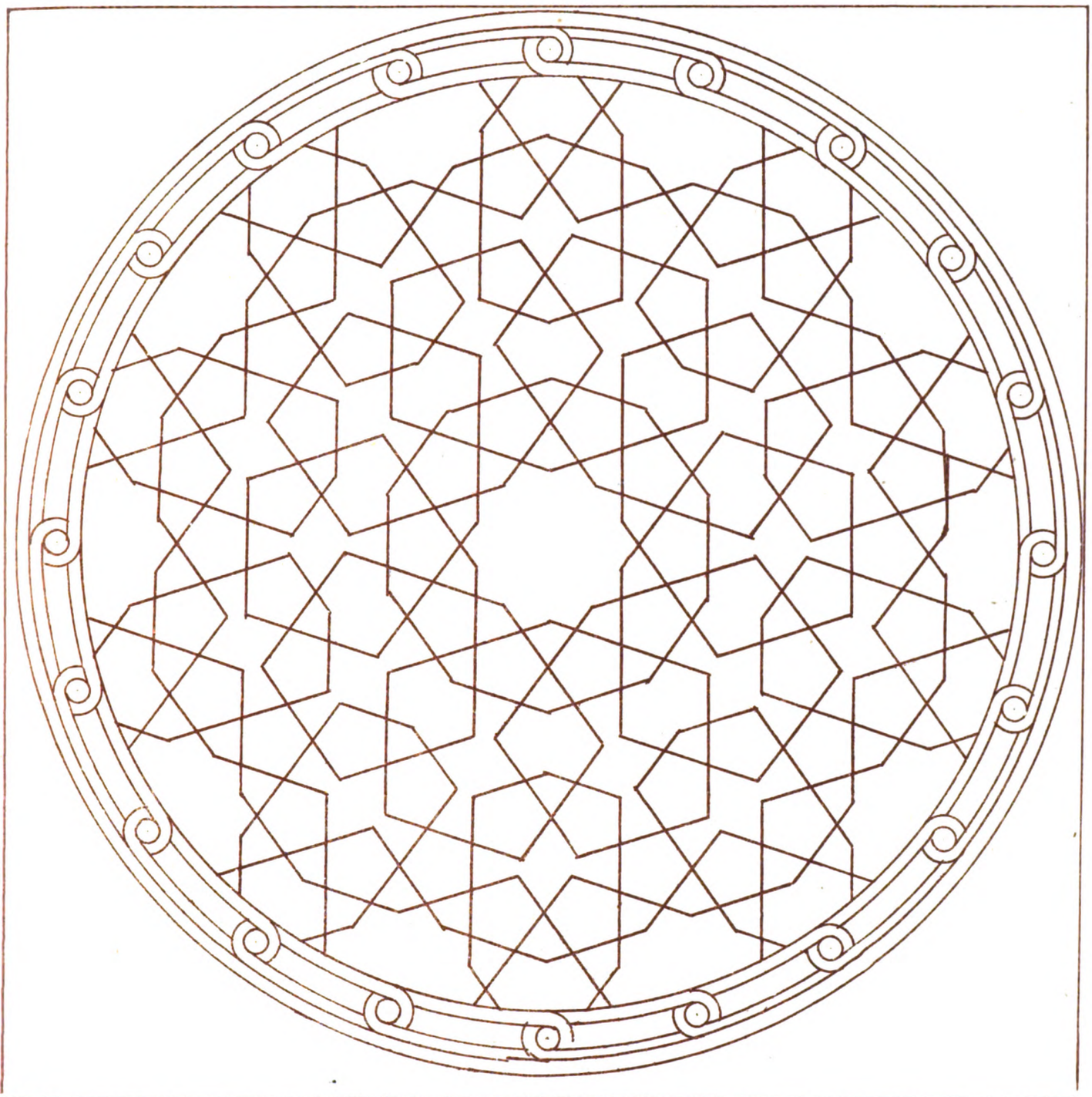

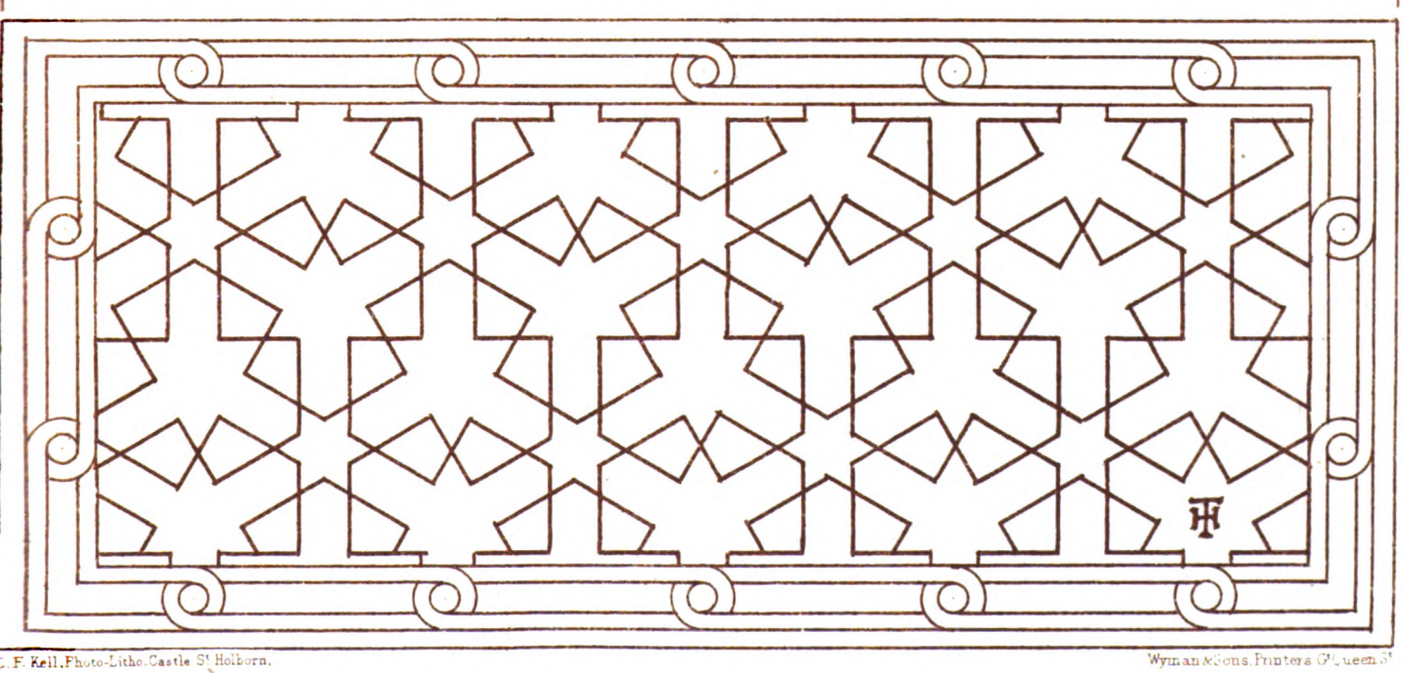

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SARACENIC GEOMETRICAL TRACERY.

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PROPOSED DESIGN FOR BRIGHTON, HOVE, AND SUSSEX THROAT AND EAR DISPENSARY, BRIGHTON.

This valuable institution has been but a few years in existence, yet its rapid development required suitable architectural extension. With this purpose in view the design we have illustrated was furnished.

It was proposed to be built of red brick and Corsehill stone, with green slates for the roof, the principal feature of the façade being the carving. The arrangement comprises, on ground-floor, waiting-room for out-patients, with separate entrance, consulting-room, &c., with kitchen and out-offices at back; on the first floor the board-room, running the whole width of the frontage, and comprising the three large bays, lavatories, &c., a large women's ward in the rear, with bay-window looking on the back, &c. On the second floor men's ward over the other, and similar to it, and on the attic floor caretaker's rooms. Necessary lifts, nurses' rooms, &c., are provided on each floor.

The floors are of fire-proof construction, with 1 in. of asphalte between two thicknesses of outer walls for the prevention of wet. The whole of the interior fittings are of pitch-pine varnished. The architect is Mr. Jerome F. D. Goodrich, Union Chambers, North-street, Brighton.

Since this design was prepared a suitable plot of ground has been purchased by the committee for the dispensary in the Queen's-road, Brighton, a commanding position in the town, which has, however, necessitated a revised design, which is now under consideration, and although the façade will lose frontage, the great depth of plot will give a separate entrance for out-patients at the rear.

SARACENIC GEOMETRICAL TRACERY.

The great beauty and wonderful variety in the ornamentation of Mahometan buildings are very striking when we consider that the artists were prohibited by the Koran against idols, and that this has been construed by their fanatical commentators into an edict against any imitation whatever of the human form or of natural objects, except in scarcely recognisable conventional forms. This compelled the Arab artists to take up a new line, and to depend upon themselves for their inspirations; and so it was, that science allied itself to imagination, and conceptions were evolved of decidedly original character from an infinite combination of geometrical lines. They delighted in intricacy, and prided themselves on perpetual novelty; but however elaborate their designs may be, they are always based on some simple form,—either the square, the triangle, the pentagon, or the hexagon; and though, to many persons, it would seem almost impossible to copy some of the more elaborate designs which decorate the mosques of Ispahan, Cairo, Damascus, Bagdad, and other Mahometan cities, a little geometrical knowledge immediately gives the clue to the principle, and at once facilitates the task. Splendour of colour is also a characteristic of Arab art, all the positives and secondaries being sometimes used in one design, but separated from one another by tracery lines of black or white or gold singly, and sometimes black and white or gold and white combined. Their harmony and repose were secured by arranging the colours on some geometrical plan. Those, in the circular design we give of the centre compartment were red; the next ten triangular spaces might be blue, the next ten pentagons red, the next triangles green, and so on. The tracery (of which we only give the centre-line) would be formed of a black centre-line and a white line on either hand, and would interlace or pass under and over at the intersections.

The Persian Mahometans, being of a different religious sect to the Arabs, were able to imitate nature, and consequently their art, in some of its examples, closely resembles that of Europe in the Middle Ages.

As in the West, in Mediæval times, Saracenic art was universally applied. Copies of the Koran were elaborately illuminated in gold and colours. Doors, lecterns, and tables were inlaid with ebony, tortoise-shell, ivory, and mother-of-pearl. Windows of cupolas and interior courts were filled with jewel-like stained glass. Walls were lined 8 ft. to 12 ft. high, with impressed faïence tiles glowing with lustre and harmonious tints, surmounted by arabesque tracery work in stucco, 4 ft. or 5 ft. deep, of designs similar to those we print. Pavements were of different marbles. Carpets were woven with wools of richest dyes; palls and sacred banners in mosques were embroidered in gold and silver and richest silks. Externally the details of doors, panels, and friezes were of rich marbles, porphyries, breccias, and serpentine.*

We have, here, then an architectural and decorative mine which has not, in this country, been very diligently explored, and as the style which has lately been in vogue appears to be going out of favour, it may, perhaps, prove a successor, and not inconsistently, inasmuch as our Queen rules over a greater number of Mahometan subjects than Kaliph, Sultan, or Shah.

THE RHIND LECTURES IN ARCHÆOLOGY.

Dr. Joseph Anderson delivered the fifth lecture of this course † (in connexion with the Society of Antiquaries of Scotland), on the 25th ult., taking for his subject "Chambered Cairns in Argyle, Orkney, Inverness-shire, &c." Dr. Anderson said that in 1871 Dr. Angus Smith, Manchester, explored the large chambered cairn at Achnacree, near Loch Etive, in Argyleshire. In form the cairn was approximately circular, 75 ft. in diameter, and rising to a height of 15 ft. in the centre. There were traces of an outward ring formed by a trench, and an embankment round it 135 ft. in diameter. The entrance passage was about 28 ft. in length, 3 ft. 6 in. high, and 2 ft. wide. It was lined with slabs set on end and covered with lintels. The chamber interior to which this passage gave entrance resembled that of the Caithness cairns in being triply divided, but differing in the manner of division. Each of the three parts of the triply-divided space formed a separately-roofed and walled chamber, the second entering by a doorway with a raised sill in the back of the first, and the third entering similarly from the back of the second. The passage decreased slightly in height from the exterior entrance inwards, so that the entrance in the first division of the chamber's interior was only 2 ft. 2 in. square. The first chamber measured on the ground 6 ft. by 4 ft. The walls were formed by flat slabs, set on edge in the lower part, over which they were built in the ordinary manner of dry walling, the upper stones lapping so as to bring the space to be covered into an area of 5 ft. 4 in. by 1 ft. 10 in. Its rudely vaulted roof was covered at a height of 7 ft. by a single stone. The two other chambers were smaller, and had no overlapping of the side and end walls, but were spanned at a lower elevation by large flat slabs. The floors of the chamber were covered with stones, strewed loosely about, and in the loose soil of the floor were found fragments of several urns of peculiar form. No indications of cremation were observed, and though no remains of unburned bodies were discovered, the presumption was that the interments were unburned, both on account of the form of the urns and the absence of burned bones, which are almost indestructible. Having described the cairn at Largie, Kilmartin, together with the urns found there, and also the cairn at Kilchoan, Dr. Anderson said that in this group of Argyleshire cairns he recognised the same features that gave character to the Caithness group, but with certain differences. They were chambered cairns; the chamber was subdivided into compartments, the roof was partly rounded by vaulting and partly by flat slabs, and in one case it was wholly flat. The contents were burials after cremation. No trace of bronze was present in any of them; and when implements were found with the interments, they were merely of chipped flint. Passing to speak of the group of cairns of a similarly interesting character to the north of Caithness, the lecturer described the Maeshow cairns, in which there were indications which led to the conclusion that the chambers were broken, probably in the hope of finding treasure, in the twelfth century. The names carved in Runes on its walls were mostly names of persons living there in the time of Earl Rognvald, the Jorsala-farer. He described the crosses carved in the chamber, and the carving of the "Dragon of Maeshow," and remarked that the art characteristics of these carvings were those of the twelfth century and of the colonial Scandinavian style; and, he held, these accidental carvings did not elucidate the story of the structure. The essential features linked it with the chambered cairns of the Scottish mainland, while its special features were those of a local variety of the general type. Having described the structural peculiarities of the chambered cairn on the Holm of Papa Westray, Dr. Anderson said that in this Orkney group of chambered cairns we had the same essential characteristics as were exhibited by the groups which had been described on the mainland of Scotland. There was a typical relationship with strong local differentiation in each of the groups, so that while the essential characteristics remained the same, the Orkney group, the Caithness group, and the Argyleshire group had each a special character of its own. Another group of cairn structures, of a very remarkable character, was situated in the little plain of Clova, on the edge of Culloden Moor, within a few miles of Inverness. Like all the others, they possess a definite internal outline and a regularly-constructed interior chamber and passage; but, unlike any of the others, there was no sub-division of the internal chamber, and they presented an external feature which was not present among the groups of similar structures peculiar to Orkney, Caithness, and Argyle,—namely, the addition of a ring of standing stones erected outside the periphery of the cairn. It was clear that all these cairns, however much they might differ from each other in their structural details, belonged to one type of sepulchral structure, differing from all other types that were present in the same area,—(1) in the possession of an interior chamber accessible by a passage; and (2) in the possession of a definite external form, which was structurally defined. In speaking of them he had called them cairns, with respect to their present appearance, but with respect to their essential characteristics it had been demonstrated that they were in reality the ruins of buildings that were distinctly structural an architectural in character and conception. The system of their structure and design was a system that produced a building with outside and inside, with roofs and floors, external and internal doorways, partitions, and passages. A just conception of these features of their character and of their significance was only attained with difficulty, and after investigation, comparison, and reflection. But their enormous magnitude was a feature of their character which gave an instantaneous impression of energy and power, and the obvious fact that they were houses of the dead instinctively challenged our respect for their builders. They were men who were in their stone age, but it was plain that they were not on that account inferior in capacity and culture to the men of the bronze or iron ages, in so far as capacity might be indicated by the construction of cairns, or culture signified by an attitude of mind which regarded the perpetuation of the memory and honour of their ancestral dead.

The sixth and concluding lecture of the present course was delivered on the 27th ult., the subject being "The Culture and Civilisation of the Stone Age in Scotland." Dr. Anderson said that, as he had before had occasion to remark of the Bronze Age, there was no vestige of a dwelling or of a defensive structure known in Scotland which could be proved by evidence to have been the work of the men of the Stone Age. It was to their burial-places that we must, therefore, look as the chief sources of the materials which might disclose the quality of the culture and the pattern of the civilisation existing among them. These materials were not abundant, but there were others which were more abundant, and whose testimony, though less direct and circumstantial, was not the less relevant to the purpose of their investigation. They were rarely found in hoards or groups. By far the larger number had been found casually in ploughing, in draining, or in excavations in peat-mosses, in the beds of rivers, and in the margins of lochs, or in sandy wastes by the sea-shore. He pointed out that stone axes and moulds for casting spear-heads of bronze had been found together at Campbeltown, Argyleshire; and that instances of stone implements occurring in groups had been found in Aberdeenshire; at Dunmore, Glenshee; at Daviot, Inverness-shire; at Ting-

* With all this, breadth and simplicity were quite consistent with this style, as may be seen by examining the photographs at the India Museum.

† For some notice of the previous lectures of the course see *Builder*, p. 569, *ante*.

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wall, in Shetland; and at Fochabers. These implements served the double purpose of tools and weapons. Speaking of the method of hafting and the form of the typical stone axe, the lecturer said that its speciality of form and fineness of finish were indications of culture, while the perforated battle-axes of stone were characterised by a fineness of finish and decoration which exhibited special skill and taste in their manufacture, and afforded evidence of the capacity and culture of their makers. In the finer forms of these chipped implements, it was manifest that their rudeness was the result of processes carefully adapted to the properties of the material, and performed with a dexterity and a precision only to be acquired by practice and experience. That their surfaces were always unsmoothed, while other implements in the same material were finely polished, was evidence that the absence of polish in them was the result of intention and not the result of incapacity. And that this abstention from all effort to produce a finer finish of surface and outline than that which resulted from the merely constructional process ought rather to be recommended as a merit than censured as a defect in the workman's culture seemed plain from the fact that, whether practically or æsthetically considered, the form thus finished possessed a character of fitness and beauty which was universally acknowledged as most admirable. This character was the result of a single process perfected to a pitch of delicacy and refinement which is now unattainable. The process which they thus invented and perfected was the very process which scientific investigation had found to be the most suitable to the qualities of the material which they employed. In all these manifestations of special knowledge and skill it was impossible to hold that there was not evidence of culture. The man of the Stone Age, whose culture and civilisation were thus made dimly visible to us by the relics of his life and the memorials of his dead, was the typical representative of primeval man in Scotland. There was no evidence of the existence in the Scottish area of any representative type of man of higher antiquity or of lower culture than this.

AN OFFICIAL VIEW OF LONDON.

To the new number of the *Nineteenth Century* Mr. G. Shaw Lefevre, her Majesty's Chief Commissioner of Works, contributes an article (with plans) entitled "Public Works in London," in which the intentions of his department in respect of Grosvenor-place and Hyde Park Corner, the site of the proposed new Public Offices, Charing-cross, and the Tower of London, are set forth and defended. Without at the present moment entering on the disputed points involved, we quote Mr. Lefevre's introductory sketch of London as it remains to us. We must, however, mention one agreeable announcement, which is to the effect that endeavours will be made to find a better position for the statue of the Duke of Wellington which now surmounts the Arch:—

In some of its many aspects London is one of the most beautiful and interesing cities in Europe. There are, indeed, vast districts in it of unredeemed ugliness, lowness, and poverty, where there is no single feature of beauty or grandeur, where the population passes through its daily toil, from the beginning to the end of life, unillumined by a ray of interest from surrounding influences, and where society seems intent on reducing life to the most monotonous and dreary existence that could be devised. Nor are dulness and monotony confined to the districts inhabited by the labouring people only; the more fashionable quarters which have grown up during the last two centuries in the west of London have been constructed on a system, and under a tenure, which was best calculated to prevent any individualism from manifesting itself; and contractors, bent only on making the utmost profit out of hundreds of houses built, for the sake of cheapness, on the same model, have impressed and stereotyped whole districts with the most uniform, dreary, and commonplace domestic architecture.

Probably also no city in the world has ever owed so little to the munificence or taste of its principal owners and wealthiest citizens. The great owners of the freehold of London, with rare exceptions, have been content to lease their land for long terms to contractors, who have built without regard to external appearance. If open spaces have been left uncovered with buildings, it has been through no consideration to the public, but in order to attract a wealthier class of tenants by the exclusive use of the gardens thus formed, and which, screened from the public by iron railings, give a sense of dreariness and seclusion which would not be tolerated by public opinion in any other capital of Europe. Of the untold wealth which has accrued, or is accumulating against the time when the leases fall in, to these London freeholders, from no efforts of their own, but from the growth of the population and the consequent continual increase in the value of land, nothing has been devoted to public improvements. They have not even contributed to their share of the great public works of utility carried out by the Metropolitan Board, as by the terms of their leases the whole of the rates, however unexpected they may be, must fall upon the leaseholders, and Parliament has not seen fit to compel these owners to contribute their share. They have also been content for the most part to live in houses of no greater external merit than those which their contractors have built for others; and of the great houses of London with character, dignity, and beauty, scarcely one belongs to those who owe the greater portion of their wealth to the metropolis. The absence of public spirit in the owners of the freehold of London is scarcely less conspicuous among its wealthiest merchants, and few indeed are the benefactions to the metropolis on their part for the purpose of adding to its permanent beauty or attractions. The improvements in Leicester-square, and the bringing to England of the Obelisk and its erection on the Thames Embankment at the cost of Sir Erasmus Wilson, are among the rare cases of the kind that have occurred.

London, however, owes much to its connexion with royalty, in respect of that which above all things is its chief boast,—its parks. What other great cities in this country have of late years owed to the munificence of wealthy citizens, or to the self-imposed taxation of their people, London has owed chiefly to the wise liberality of its sovereigns, whose ancestors, fortunately, through love of sport, had provided themselves with ample parks for this purpose, in close contiguity to the palaces in or near London. Regent's Park, formerly called Marylebone Park, came into possession of the Crown in Queen Elizabeth's time. Hyde Park was taken by Henry VIII. from the Abbey of Westminster in exchange for the lands of a dissolved priory in Berkshire; and St. James's Park by the same monarch from Eton College in exchange for other lands. The three together formed a hunting-ground for Henry VIII. of considerable extent and wildness. Hyde Park was opened to the public for the first time of his own free will by Charles I., and though it was closed again during the Commonwealth, and indeed sold in three lots, yet on the restoration the sale was annulled, and the park was again made public. The Green Park was purchased by Charles II., and the same monarch opened both St. James's and the Green Park to the public in the autumn of 1660; and the Regent's Park, as its name indicates, was opened to the public by the Prince Regent in the early part of the present century. The splendid application of Kew Gardens to scientific purposes was due to the wise generosity of our present Queen. Battersea and Victoria Parks were bought out of moneys voted by Parliament, a part of which it was intended to recoup by the sale of frontages, before the existence of the Metropolitan Board, and before the time when it was considered that the supplying such breathing-places was a function of municipal government. The wide demains of Richmond, Hampton Court, Greenwich, and Bushey have also long been enjoyed by the public, owing to the fortunate propinquity of these royal possessions to the metropolis. These are all now separated from the management of the Crown property, and under the Act of 1851 maintained at the cost of the country, under the control of the Office of Works; and it is matter of common acknowledgment that the management of these parks, and especially the gardening of the more central of them, have of late years marvellously improved, and leave nothing to be desired in comparison with those of any other capital in Europe.

Looking broadly at the results of these operations, it may safely be said that no other city or number of cities have in their neighbourhood so many and so beautiful or so varied places of public resort open to all the world. The views from Hampstead Heath, from Plumstead Common, near Woolwich, and from the higher parts of Epping Forest, are unequalled in their various aspects, while on Wimbledon Common, on Blackheath, on Barnes Common, and many others that could be named, the public have opportunities of breathing fresh air and of enjoying nature in its primitive state to a degree which is wholly unexpected in the neighbourhood of such a population. It would require many years thoroughly to explore all that the neighbourhood of London has to offer in this direction, and, as all these places are within an easy walk, they may be enjoyed by people of all classes.

Turning from our parks and commons to the buildings of London, it is necessary to speak with less of praise. Considering its vast size, and its enormous population, the number of buildings of architectural importance is not large; but what we have of them are perhaps not to be easily matched in other cities. What is beautiful and interesting in London is for the most part concentrated on the banks of the river from Lambeth Palace and Westminster to the Tower of London, and the streets north of the river which are parallel to its course. It is singular, indeed, that in a city of the antiquity and size of London the buildings which have been preserved to us from ancient times should be so few in number. Of buildings erected before the year 1100 we have only now survived the keep of the Tower and its chapel of St. John, built by Bishop Gundolph, one of the most perfect specimens of Norman architecture in England, the chapel of the Pyx in Westminster Abbey, and the old tower in the precincts of the Abbey known as the Jewel House. Of the twelfth-century work we have remaining only St. Bartholomew the Greater, in Smithfield, and the round church of the Temple (much modernised, however), and three or four ancient crypts in the City. To the thirteenth century we owe Westminster Hall, the choir, transepts, and nave of Westminster Abbey, the inner church of the Temple, the chapel of Lambeth Palace (much altered), and the outer walls, water-gate, and the church of St. Peter ad Vincula in the Tower of London. Of fourteenth-century work we have but little; it consists of the College Hall and the Abbot's House of Westminster, the Jerusalem Chamber, and part of the cloisters of the Abbey, built by Abbot Littlington, the cloisters of the Houses of Parliament, the Church of St. Helen, Bishopsgate-street, and St. Saviour's, Southwark. Between 1400 and 1500 were built the Guildhall, Crosby Hall, the gateway and the Lollards' Tower of Lambeth.

The next century, from 1500 to 1600, gave us Henry VII.'s Chapel at Westminster Abbey; the three gateways of St. John's Priory, Clerkenwell, of Lincoln's Inn, and of St. James's Palace; the churches of St. Andrew Undershaft and St. Giles's, Cripplegate; Gray's Inn Hall, Middle Temple Hall; the Chapel Royal, St. James's, the Savoy Chapel; the older parts of Hampton Court, and part of Fulham Palace.

Coming to more recent times, it may be said that London owes what it has of interesting and important buildings to the genius mainly of three architects,—to Inigo Jones, to Sir Christopher Wren, and to Sir Charles Barry. Other architects are represented by one or at most two works, many of them of great merit, but these three alone can be said to have set their mark upon the general tone of London architecture.

Of Inigo Jones's work we have the Banqueting House, Whitehall, the Rolls Chapel, the Gateway of Westminster School, the Water Gate of York House, St. Paul's, Covent Garden, the chapel of Lincoln's Inn, Shaftesbury House, Bishopsgate-street, and the interior of St. Catherine Cree; and we have a reminiscence of his work in the Strand frontage of Somerset House, which was adapted by Sir W. Chambers from the original building erected by Inigo Jones.

Sir Christopher Wren had the splendid opportunity offered by the clean sweep made of the City churches and buildings in the Great Fire of 1666. To the variety and vigour of his genius we owe a great part of what the City of London still has of architectural interest. Besides St. Paul's, the noblest fane of modern times, of Italian Classic style, with the exception of St. Peter's at Rome, and exceeding that in the grace and beauty of its exterior, he rebuilt fifty-three churches, many of which, such

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as St. Michael's, Cornhill; St. Stephen's, Walbrook; St. Mary-le-Bow, and St. Bride's, are most beautiful specimens of their style. We owe also to Wren the more modern parts of Hampton Court, the two rare blocks of Greenwich Hospital, with their splendid colonnades; Chelsea Hospital, Marlborough House, Kensington Palace, the Halls of the Paper Stainers' and the Skinners' Companies, the College of Physicians, and the western towers of Westminster Abbey. Of his many churches, two only,—St. Mary Aldermary, and St. Alban, Wood-street,—are in the Gothic style.

To no architect since the time of Wren does London owe so much as to Sir Charles Barry. Of his work we have the Reform Club and the Travellers' Club, the reconstructed Treasury buildings fronting Whitehall, the College of Surgeons in Lincoln's Inn-fields, and Bridgwater House, all buildings of high merit; and, lastly, we owe to him the Houses of Parliament, a building which, whatever criticism in detail it may call forth, is, undoubtedly, when looked at as a whole, a most beautiful conception, and worthy alike of its site and its purpose. After this, the only public buildings which need be noticed are the Public Offices, by Sir G. Scott; the Natural History Museum, recently completed by Mr. Waterhouse; and the New Law Courts, the architect of which (the late Mr. Street) died but a few months ago, not before he had completed every design for the marvellous variety of detail of this building, but before he could realise in its entirety the result of this his greatest and most beautiful work.

Of private mansions there are but very few in London and its neighbourhood worthy of notice. Among the few exceptions are Holland House, one of the most beautiful specimens of Tudor Domestic architecture; Charlton House, near Woolwich; Ham House, the unaltered and most interesting family residence of the Dysart family; Sion House, the seat of the Duke of Northumberland, on the top of which is to be seen the lion formerly so familiar to London on the house improved away to make place for Northumberland-avenue. In the more populous parts of London, the list of really fine houses is very small. It comprises Spencer House, Bridgwater and Stafford Houses, and Dorchester House,—a remarkably beautiful specimen of pure Italian style, and a great ornament to Hyde Park. Of other great public works of modern times, it is almost superfluous to mention the magnificent embankment of the Thames; and the three beautiful arches, with connecting pillars, at the entrance of Hyde Park, by the late Mr. Decimus Burton.

It will be obvious from this slight survey how few are the relics which have come down to us intact from olden times. It may warn us how sacredly we should preserve them, and how important it is that they should be opened out to the fullest view on every side. It also shows that, while much has been done in the past few years, a wide field remains, in which all the agencies for the improvement of the metropolis may find work for a long time to come. The means at the disposal of the Government for this purpose are necessarily limited, as the general taxpayers are rightly jealous of the expenditure of public money for any purely metropolitan work; and in the future there is more to be hoped for from the Metropolitan Board, or whatever may hereafter be the municipal government of a united London, than from any Government agency.

Richard Trevithick.—The Cornwall correspondent of the *Mining Journal* says,—There is no unmemorialised man in England to whom the county lies under a deeper debt than it does to Richard Trevithick,—one of the group of Cornish worthies on whom Mr. Worth lectured at the recent Polytechnic Exhibition, and of whom he spoke as probably the greatest all-round inventor the world had ever seen. It is no credit to popular writers upon engineering matters that Trevithick should have been cold-shouldered into oblivion while Watt and the Stephensons were written into far more than their due meed of fame, great as that meed undoubtedly was. This injury to his memory can never be recovered, but something might surely be done in the county of his birth, as proposed, to associate his name with a work of popular utility. Need his grave at Dartford lie any longer unmarked by monument or record of the great man whose bones lie beneath its sod?

THE ANNUAL REPORT OF THE LOCAL GOVERNMENT BOARD.

The eleventh annual report of the Local Government Board, as now constituted, lately issued, is a voluminous record of a year's work in connexion with poor-law administration, local government and taxation, and the public health. The report is for the year between March 25th, 1881, and March 25th, 1882, and contains a mass of information and statistics.

Among the encouraging items in the report, we find testimony borne to the effect of sanitary improvements in diminishing the death-rate. The report adds to the remarks made in last year's report upon the steady improvement of the public health, as indicated by the progressive reduction in the death-rate, that the death-rate of 1881 was lower than that of any other year since the establishment of civil registration in 1837. The rate of mortality from all causes in 1881 was only 18·9 per thousand of population, while in the two decades,—1861-70 and 1871-80,—it averaged 22·5 and 21·5 respectively. The rate from the seven principal zymotic diseases was 2·24 per thousand in 1881, whilst in those decades it was 4·11 and 3·36 respectively. The rate from fever was 0·27, whilst in 1861-70 it was 0·88, and in 1871-80 it was 0·49. "We cannot," says the report, "but regard this progressive diminution in the mortality from zymotic diseases, and especially from fever,—which is probably the most amenable of all to sanitary control, as a special matter for congratulation."

As a large number of plans for hospitals are from time to time submitted by Boards of Guardians for approval by the Local Government Board, it seemed desirable to the Board that in this matter we in England should avail ourselves of anything which can be taught us by the experience of foreign countries as regards the arrangement and construction of such buildings. With that object the Board instructed their architect, Mr. P. Gordon Smith, to visit certain hospitals at Heidelberg, Strasburg, Paris, and St. Denis, which were stated to present good examples of various types of improved hospital construction. Mr. Smith's report of the short inquiry which he was able to make on the subject, together with some notes by Dr. Mouat, who accompanied him, is printed in the Appendix to the Board's report. The hospitals reported upon are the Academische Krankenhausat Heidelberg, the Chirurgie Klinik at Strasburg, the Hospital Bichât at Paris, the Municipal Hospital at St. Denis, and the isolation-wards for puerperal fever at the Lariboissière Hospital, Paris. Mr. Smith gives a great many interesting details as to cost and arrangement of these buildings, and says that the general result of his observations at the several institutions leads him to believe that much advantage is to be gained from an insight into the most recent hospital arrangements adopted in other countries. One of the most important points that struck him was the large extent of site compared with the number of patients occupying the buildings erected thereon. The tendency in the modern hospitals described in the report is to subdivide each institution itself into a number of detached ward-blocks containing comparatively a small number of patients in each. This is especially noticeable at Heidelberg and St. Denis.

Dr. Mouat, in his notes appended to Mr. Gordon Smith's report, says that the chief feature of excellence, in a medical sense, of the hospitals mentioned consists in the perfect separation of wards devoted to different purposes, and the consequent complete classification of cases which this separation renders possible. The rough arrangement, adopted in most of the older hospitals at home and abroad, into medical and surgical wards, with a separation of the sexes, is now known (says Dr. Mouat) to be quite inadequate to secure the highest standard of healthy conditions in the treatment of disease. Each pavilion or block being self-contained, with all the needful means and appliances, as well as the staff required, is also a first-class factor in obtaining the same end. A general feature of undeniable advantage in all the Continental hospitals now in course of construction is the extended area in which the best of them stand; the utilisation of the interspaces as gardens; and the arrangements made by verandahs and otherwise of getting the sick into the open air the moment they are able to leave their beds,—and even before, in surgical cases, when the weather permits. Dr. Mouat regrets that the time at Mr. Smith's disposal did not permit of his seeing the Friedrichshain Hospital in Berlin, which has been some years in occupation; the Moabite Hospital for the treatment of infectious diseases, in the same city; and the Maternity Clinique recently built and occupied in connexion with the École de Médecine, in Paris. The latter, however, in Dr. Mouat's opinion, possesses some serious defects, which would, he feared, take no long time to reveal. The building had not been occupied at the time of his visit.

Under the Artisans' and Labourers' Dwellings Improvement Act the Board have authorised the borrowing of 1,878,374*l*., and have recommended the advance of all except 57,374*l*. by the Commissioners at a low rate of interest. The borrowers were—Birmingham, 1,500,000*l*.; Liverpool, 50,000*l*.; Norwich, 10,000*l*.; Swansea, 121,000*l*.; Walsall, 15,000*l*.; and Wolverhampton, 182,374*l*.

The Alkali Act of 1881 did not take effect till this year. Dr. Angus Smith, in his seventeenth annual report, appears to indicate that sulphuretted hydrogen, the most offensive gas escaping from chemical works, escapes less from the works than from alkali waste heaps and the drainage therefrom, with which there is power to deal; and as regards the acid gases, excess of escape has been generally conquered, and the chief difficulty remaining is in condensation, as to which he offers some suggestions.

As to the metropolitan water-supply, the report cites the report of Lieutenant-Colonel Bolton as to the floods making the water of the Thames and Lea polluted and difficult to filter,—a difficulty which was successfully contended with except by the Southwark and Vauxhall Company, who were unprovided with sufficient storage reservoirs, and who were compelled to take in dirty and muddy water. Reference is also made to the report of Professor Frankland, which states that little more than one-twentieth of the whole supply can be described as of uniformly good quality for drinking, and to the voluntary report of Messrs. Wanklyn & Cooper that London water compares advantageously with that of other large towns. Constant supply was extended to 20,377 houses in 1881, but had still to reach three-fourths of the houses in London. Fire hydrants are increased, but still fires occur frequently, the reports of which describe the water arrangements as unsatisfactory.

WHITE'S CLUB, ST. JAMES'S-STREET, PICCADILLY.

White's Clubhouse has recently undergone extensive alterations. In consequence of the back portion of the premises adjoining Jermyn-street (consisting of the Strangers' Dining-room, Kitchen, and other offices) having been erected on Crown land, the lease of which expires early in 1883, it was determined to re-arrange the front and principal portion of the premises so as to obtain all requisite club accommodation: this has been done by the construction of a lofty and commodious kitchen on the second floor of the back portion of the front premises, with a pantry, scullery, and a powerful lift to the same from the basement level.

The old floor was not removed, but a second and fireproof floor has been constructed with rolled-iron joists filled in with galvanised corrugated iron centreing, and the whole covered with concrete, composed of Portland cement and coke breeze.

The large and handsomely-decorated room which extends the whole frontage of the premises on the first floor (formerly used as a card-room) will now be used as a members' and strangers' dining-room, and will form one of the most capacious club dining-rooms in London. It is supplied from a composite service-lift from the kitchen, which will also supply the private dining-room in the rear.

The left-hand wing of the back portion of the premises has been extended in width on the ground-floor to make it wide enough for a billiard-room, and the room in the basement under the new billiard-room will now be used as the servants' hall.

The old billiard-room is now converted into and appropriately furnished for the strangers' smoking-room. These works, with numerous alterations in the front basement of the premises, have been executed in six weeks by

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Messrs. W. & E. Curtis, of Curzon-street. The kitchen has been fitted up with every modern convenience suitable for an establishment of this magnitude by Messrs. Jones, Dray, & Co., of Castle-street, Leicester-square; and the whole of the works have been executed from the plans prepared by and under the superintendence of Mr. Thomas Milbourn, architect.

THE PARKES MUSEUM.

The first general meeting of the members of the Parkes Museum, since the incorporation of the Museum, was held on Saturday last (October 28th, 1882), at the new premises lately acquired by the Council in Margaret-street, Regent-street. Captain Douglas Galton, C.B., was voted to the chair, and amongst those present were Mr. Thos. Twining, of Twickenham; Mr. George Godwin, Professor de Chaumont, Professor John Marshall, and numerous other gentlemen interested in the success of the Museum. The secretary, Mr. Mark H. Judge, having read the notice convening the meeting, it was unanimously resolved that H. R. H. Prince Leopold Duke of Albany, who had graciously consented to accept the presidency, be formally elected to that office. The following noblemen, ladies, and gentlemen, all of whom had signified their consent, were then elected vice-presidents:—The Duke of Northumberland, the Duke of Westminster, the Earl of Derby, Earl Fortescue, the Baroness Burdett-Coutts, Sir Richard A. Cross, M.P., Sir Joseph Fayrer, K.C.S.I., Miss Florence Nightingale, Mr. Edwin Chadwick, C.B., Professor Huxley, Mr. Robert Rawlinson, C.B., and Professor Tyndall. The following gentlemen were then elected as the Council of the Museum, in whose hands its administration is vested:—

Captain Douglas Galton, C.B., F.R.S., chairman; Dr. George Vivian Poore, vice chairman; Berkeley Hill, esq., M.B., 55, Wimpole-street, W., treasurer; Professor W. H. Corfield, M.A., M.D.; Rogers Field, esq., B.A., M.Inst.C.E.; George Godwin, esq., F.R.S., F.R.I.B.A.; Dr. William R. Gowers; Professor T. Hayter Lewis, F.S.A.; Professor John Marshall, F.R.S.; Charles Henry Parkes, esq.; Dr. J. Russell Reynolds, F.R.S.; Edward C. Robins, esq., F.R.I.B.A.; Dr. Edward H. Sieveking; Professor T. Roger Smith, F.R.I.B.A.; Dr. J. Charles Steele; Thomas Twining, esq.; Alfred Waterhouse, esq., A.R.A.; Dr. Dawson Williams, hon. secretary.

Capt. Douglas Galton, in replying to a vote of thanks for presiding, said that the Museum had now entered on a fresh phase of existence, and had established itself as an independent institution, in premises which, after the necessary alterations had been completed, bid fair to serve its purpose, for the present at least, admirably. The Council contemplated making the sanitary arrangements necessary for the museum itself as perfect as possible, and it was intended that all such arrangements should be useful for teaching purposes; the drainage, for instance, had been carefully considered by Professor Corfield and Mr. Rogers Field, M. Inst. C.E., and the latter gentleman had generously undertaken to bear the whole expense of carrying it out. Mr. Twining had undertaken the whole trouble and cost of arranging, and for the most part of providing, the Food Collection; the Warming, Lighting, and Ventilating have been referred to a special committee, whose endeavour it would be to ensure that every appliance was the best of its kind. The general collection was to be carefully weeded and re-arranged, and it was hoped that the Museum would be opened to the public soon after Christmas.

THE LANCASHIRE "PLATEWAY."

Such is the name of a new engineering project which is likely to make its appearance in Parliament next session in the hope of obtaining Legislative sanction. It aims at effecting a very great change of method in the inland transit of merchandise, but in the first instance its sphere is restricted to the manufacturing districts of Lancashire. If practicable in Lancashire, it will be practicable elsewhere, and the scheme, therefore, involves vital issues for the railway companies,—at least, so far as goods traffic is concerned. Broadly, the proposal is to lay out a series of roadways radiating from Liverpool to the centres of manufacturing industry in South Lancashire, to carry along these roadways a double set of iron plates corresponding in breadth with the wheels of ordinary lorries or wagons (and having raised flanges on their outer edges to keep the wagons on the track), to set the loaded wagons on this smooth plateway, and draw them by steam traction engines to their appointed destination. Passenger traffic is excluded from the scope of the scheme; it is confined entirely to goods, and the anticipation is that it will be possible to carry these at a much lower rate than is now charged by the railway companies. The movement has its origin and motive in the burdensome charges now levied by the companies.

The "plateway" is not, we are assured, put forward as a rival or counterblast to the contemplated Manchester ship-canal. It aims at facilitating the transport of cotton and other commodities to and from Liverpool and Manchester. To take the case of a bale of cotton which has to be conveyed from a ship at Liverpool to the mill at Manchester or elsewhere. Under existing usage it undergoes frequent transference from carts or vans to railway trucks, and *vice versâ*, and, of course, all these transfers augment the cost of transport while at the same time delaying it. The process of the "plateway" will be infinitely simpler, and, therefore, proportionately cheaper. The bale will be loaded on to the appointed wagon at the ship's side or at the warehouse door, the wagon will be drawn by horses to the nearest station of the Plateway Company, it will be linked on to a long train of other similar wagons, a steam traction-engine will be placed at the head of the train, and it will haul the whole train of vehicles along the smooth plateway to the appointed destination. At the further end of the plateway the traction-engine will be disconnected, horses will be yoked to the wagons, and they will at once be drawn to the mill-yard. By this treatment all the labour and expense of repeated transhipments will be obviated. The same vehicle that receives the cotton at the Liverpool dock or warehouse will deliver it into the mill without any intermediate handling. According to the Liverpool correspondent of the *Times*, the scheme, as mapped out by the projectors, covers a large portion of the manufacturing districts of Lancashire. The present proposal is to lay down 133½ miles of plateway, at a rough estimate, costing about four a half millions of money. There are two main routes, one starting from the south end of Liverpool and running to Oldham, *viâ* Warrington, touching the south side of Manchester, and taking in Ashton and Staleybridge. The other route starts from the north end of Liverpool, touching St. Helen's, Ashton-in-Makerfield, Bolton, Bury, Heywood, and Rochdale, and, like the other line, terminating in Oldham. There will also be subsidiary lines leaving the main road at convenient points, and branching off to Burnley in one direction and Preston in another.

The originator of the project is Mr. Alfred Holt, of Liverpool.

DEATH OF A WELL-KNOWN BUILDER AT FLEETWOOD.

The death has just been announced, at the age of seventy-four, of Mr. Thomas Atkinson Drummond, a builder and contractor at Fleetwood, who for more than a quarter of a century past has been well known as the builder of almost every house in Fleetwood from the time of its foundation in the year 1836 to a period of something like three decades later. The deceased, who was greatly attached to Fleetwood, was a native of Newcastle, where he served an apprenticeship to a bricklayer, and subsequently, having been a journeyman in London and Dublin, he repaired to Manchester, where he became a sub-contractor in brickwork for several new bridges. In 1837, the year after the foundation of Fleetwood, having heard glowing accounts of what was then designated "New Liverpool," he was induced to take up his residence there, and he soon became a contractor for the brickwork of the greater portion of the houses and other buildings which quickly rose up in succession in the newly-founded town. He erected most of the public buildings which rose up within thirty years after the first formation of the town. Of churches and public institutions he was contractor for the large Roman Catholic church, the Independent chapel, the Wesleyan Methodist chapel, the Primitive Methodist chapel, and the Whitworth Institute. The deceased had been one of the Town Improvement Commissioners from the passing of the Improvement Act in 1841 to the time of his death. He was the largest owner of house and warehouse property in Fleetwood. His funeral last week was attended by the Improvement Commissioners and members of other public bodies, and a numerous gathering of the residents.

RESTORATIONS AT THE TOWER.

Some fresh buildings are about to be erected at the Tower of London by the Commissioners of her Majesty's Public Works and Buildings, and in order to clear the site for the intended structures, the materials of the large block which has for many years been used as the Ordnance office and stores were sold by Messrs. Horne, Eversfield, & Co., on Monday. This building, which is towards the east end of the Tower overlooking the Thames, and situated between the Wakefield and the Salt Towers, contains a spacious ground area, being upwards of 160 ft. in length and 90 ft. in depth, and contains four lofty floors. It was erected at different periods. The basement is said to have been built some 200 years ago, in the latter portion of the seventeenth century; whilst the first and second floors were erected about a century since, during the reign of George III. The third or top floor is of comparatively recent erection, having been built in 1854, during the period when the Crimean War was raging, and here the Guards were entertained at a public dinner on their return from the Crimea in 1856. The sale of the materials on Monday was held in this apartment, where there was a numerous attendance of builders and dealers in this class of property. The catalogue contained 129 lots, and stated that the building comprised upwards of a million bricks, in addition to the stonework, and a large and valuable quantity of ironwork (including 100 iron columns), and lead. The timber, stone, and ironwork connected with the different floors, comprising 120 out of the entire number of 129 lots having been disposed of; the lead on the building was offered in two lots, and realised 269*l*. The brickwork forming the main walls and carcass of the building, sold in four lots, concluded the sale, realising only the moderate sum of 216*l*. The total proceeds of the sale amounted to 1,320*l*. It was stated that the estimated original cost of the building was between 30,000*l*. and 40,000*l*. The purchasers of the materials are under an engagement to have the whole of them removed in six weeks, when the buildings intended to be erected on the site will be at once commenced by the Office of Works.

They will extend eastward from the Wakefield Tower to the Salt Tower, the main feature being the restoration of the old Lantern Tower, which is to be erected about midway between the above-named two towers, and exactly on the site which it formerly occupied, many centuries ago, before the building now about to be taken down was erected. The original foundations of the old Lantern Tower have recently been discovered, and upon them the restored historical structure will be erected. The drawings for its erection have been made from old sketches, and in the rebuilding of it all the original features will be preserved, the materials, as far as possible, consisting of the old stones forming the building annexed to the White Tower, which was some time ago taken down. Between the three towers a stone wall, in continuation of that on the west side of the Wakefield Tower, and in every respect uniform with it, will be carried along eastward in front of what was formerly the palace, to the boundary of the Salt Tower. The removal of the Ordnance Offices, which are upwards of 70 ft. in height, will open out a commanding view of the White Tower from the river. When this particular portion of the work has been completed, the old and now disused horse-armoury, which was built in 1826, on the south side of the White Tower, will be taken down when the original plinth of the White Tower will be exposed to view.

Within the last few weeks the horse-armoury has been removed from the last-named building into the upper floor or council-chamber of the White Tower, and is now being arranged there, an oaken handrail being carried round the apartment alongside the different specimens of armour. The smaller chamber, on the east side of that in which the horse-armoury is arranged, is now fitted as a museum for the display of Indian armoury. The specimens will be enclosed

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in lofty and spacious ebony glass cases, erected on two sides of the chamber. The whole of the new horse-armoury arrangements and the Indian museum are being carried out by the Royal Engineering Department of the Tower, Sergeant-Major Andrews, R.E., being foreman of the works. It is to be hoped he is competent.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

4,875. E. Guattari, London. Device for preventing the surreptitious opening of doors and windows. Oct. 13, 1882.

4,894. J. Wadsworth, Manchester. Apparatus for heating, cooking, and ventilating, &c. Oct. 14, 1882.

4,936. P. M. Justice, London. Water or stench-trap connexions. (Com. by C. Lightbody, Brooklyn, U.S.A.) Oct. 17, 1882.

4,951. J. M. Hart, London. Automatic registering apparatus for closet doors, &c. Oct. 18, 1882.

4,980. H. McRuer, Glasgow. Cooking-ranges. Oct. 19, 1882.

4,995. T. Kay, Stockport. Apparatus for warming and heating rooms and places, &c. Oct. 20, 1882.

5,027. G. A. Biddis, Newbury. Apparatus for regulating the supply of water to water-closets, &c. Oct. 21, 1882.

5,041. E. Green, Halifax. Sewage-traps. Oct. 23, 1882.

5,100. H. M. Tarratt, London. Appliances for securing window-curtains, &c. Oct. 26, 1882.

5,106. W. H. Lindsay, London. Construction of window-sashes. Oct. 26, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named :—

Oct. 17, 1882.

2,859. H. C. Tucker, Peterborough. Sash-weight attachments for sash windows. June 17, 1882.

3,145. C. Priestland, Birmingham. Rack pulleys for blind-cords. July 4, 1882.

3,702. L. Roth, Wetzlar, Germany. Manufacture of cement. Aug. 3, 1882.

3,956. J. H. Johnson, London. Production of artificial stone, &c. (Com. by the Certaldo Marble Company, Paris.) Aug. 18, 1882.

4,090. W. Thornburn, Boroughbridge. Appliances for heating and warming. Aug. 26, 1882.

Oct. 20, 1882.

2,828. E. H. Baxter, Birmingham. Attaching door-knobs to their spindles, &c. June 15, 1882.

2,868. J. Thomas, Bangor. Apparatus for cutting or shaping stone. June 17, 1882.

3,103. W. A. M. Valon, Ramsgate. Bricks and tiles. July 1, 1882.

October 24, 1882.

2,926. A. K. Robinson, Leeds. Cooking ranges and stoves. June 20, 1882.

3,223. J. H. Topham, Manchester. Filtration of water for domestic and other supply. July 7, 1882.

3,229. U. Bromley, G. Crowe, and W. James, Chester. Flushing apparatus for water-closets, urinals, &c. July 7, 1882.

3,324. C. Portway, Halstead. Gas stoves. July 13, 1882.

4,112. W. M. Brown, London. Baths. (Com. by W. W. Rosenfield, New York, U.S.A.) Aug. 29, 1882.

October 27, 1882.

2,961. J. Harsant, London. Flushing water-closets, traps, and urinals, &c. June 22, 1882.

3,000. G. Dawson and C. Butcher, Thorncliffe. Kitchen ranges. June 24, 1882.

4,281. S. Heimann, London. Treatment of peat for paving purposes, &c. Sept. 8, 1882.

4,438. J. W. Andrews, Whittlesea. Blind roller furniture, &c. Sept. 8, 1882.

4,655. R. Hudson, Gildersome. Construction of metallic staircases. Sept. 30, 1882.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending October 21, 1882.

1,077. J. J. Lish, London. Fire-blowers for hastening combustion and abating smoke in fire-grates, &c. March 6, 1882. Price 6d.

A soft sheet of iron is fitted to the grate, which is sufficiently flexible for the force of the draught to make it fit tight to the front of the fire-place.

1,113. R. Pearson, Kingston-upon-Hull. Combination stench-traps. March 8, 1882. Price 6d.

This is a double trap, the first being of a smaller capacity and leading into the second larger one.

1,143. E. P. Phillips, London. Spring hinges. March 9, 1882. Price 6d.

The pin of the hinge is formed by two divided parts, a projection on the end of one fitting into a hole in the end of the other. A helical spring is wound round this divided pin, with each end secured in one of the parts. Each part is secured to opposite flaps of the hinge. Thus whichever way the door opens the spring is brought into play.

1,213. R. Wright, Richmond. Fire-grates. March 13, 1882. Price 4d.

After the fire is lighted, a small quantity of lime is sprinkled on the top of the coals to consume the smoke.

1,228. J. Chaffin, Bath. Glazing green-houses, sky-lights, &c. March 14, 1882. Price 2d.

To dispense with the use of putty, felt, indiarubber, or other soft waterproof material is used, which is placed round the edges of the glass and secured to the frames. (*Pro. Pro.*)

1,236. W. R. Lake, London. Venetian blinds. (Com. by A. H. Lindefedt, Gothenburg.) March 14, 1882. Price 2d.

These are rolled round rollers instead of being drawn up in the usual way. (*Pro. Pro.*)

1,251. J. T. Todd, Edinburgh. Roadways, tramways, and railway platforms, &c. March 15, 1882. Price 2d.

The wooden blocks are set in a metallic framing in which there is a separate socket for each block. (*Pro. Pro.*)

Published during the week ending October 28, 1882.

370. A. Cordingley, Bradford. Finishing the surface of concrete floors. Jan. 25, 1882. Price 2d.

The surface is rolled by a roller with grooves, thereby raising slight projections thereon. (Protection not allowed.)

394. H. M. Bennett, Liverpool. Isolating fire and smoke from the auditorium in theatres, &c. Jan. 26, 1882. Price 2d.

A perforated water-pipe is run along the top of the curtain, so that when this is lowered a sheet of water can play down it. (Protection not allowed.)

1,128. J. Ra vson, Balsall Heath. Apparatus for controlling the flow of water from cisterns. March 8, 1882. Price 2d.

A stand-pipe is fitted to the long leg of the syphon in the cistern, on the end of which is a valve. When this is opened, the flow of water exhausts the air out of the syphon, and sets up the action. (*Pro. Pro.*)

1,175. E. B. Edwards, Liverpool. Roofing materials. March 10, 1882. Price 2d.

These slates are formed of well vitrified silicate of alumina and silica. They are baked at a high heat, and a glaze is formed on them with salt oxide of lead. (*Pro. Pro.*)

1,232. J. H. Johnson, London. Bricks or blocks for building walls, &c. (Com. by F. Bander, Paris.) March 14, 1882. Price 2d.

The bricks have ribs or projections on them which fit into corresponding recesses in the next adjacent bricks, by which they are locked together. (*Pro. Pro.*)

1306. W. Simmons, Maidstone. Ingredients for the manufacture of hearthstone. March 17, 1882. Price 2d.

These are Hassack stone, chalk, and Portland cement, which are ground and mixed with water. The blocks are then moulded therefrom.

1,325. C. Slagg, Leeds. Drain and sewer pipes. March 18, 1882. Price 4d.

A rest is formed on the outer edge of the socket which supports the spigot end of the next pipe while the joint is being made tight.

1,326. C. Slagg, Leeds. Traps for drains. March 18, 1882. Price 2d.

To create a sufficient velocity through the trap with the ordinary run of sewage the sectional area of the throat is reduced. (*Pro. Pro.*)

1,388. G. Kent, Portsea. Chimney-tops or ventilators. March 22, 1882. Price 6d.

A tapered perforated tube is placed on the top of the chimney, on which is the inverted frustrum of a cone, above which are a series of conical frustra, the whole being surmounted by a cap. These are all surrounded by a cylindrical casing, somewhat larger than the outer circumferences of the frustra.

The Fall of a Railway Bridge.—The late accident on the Great Western Railway (Weymouth branch), when a bridge fell, through the floods, and caused the death of a stoker, formed the subject of inquiry at an inquest held on the 27th ult., at Cattistock. According to the evidence, the foundations of the bridge had been undermined, the structure, which was of wood, easily giving way, as it was only supported by brick abutments. Only a few days before the bridge had been inspected and found safe. "Accidental death" was the finding of the jury.

WATER SUPPLY.

St. Helen's.—The ceremony of turning the first sod for two wells which the Corporation of St. Helen's have commenced sinking on Lord Derby's Knowsley estate was performed on the 28th ult., by the Mayor of St. Helen's, Mr. Richard Pilkington. Alderman M'Bryde (chairman of the Water Committee), before calling upon the Mayor to cut the first sod of the new works, gave a brief history of the St. Helen's Waterworks, and the reasons which had compelled the Council to seek an additional water-supply from that district. He then expressed the belief that they had every reason to expect that from those proposed works an abundant supply of water would be obtained, which, with the water obtained from existing sources, and the supply they were entitled to demand from the Liverpool Corporation upon the water from Vyrnwy being delivered to that city, would, he hoped, be sufficient to meet the requirements of the town for many years to come. Mr. Gaskin is the engineer. It is intended to first sink two wells at Knowsley, each to be about 150 ft. deep, with an additional bore-hole of between 300 ft. and 400 ft. deep, the two wells being connected with a drift-way, after which a well will be sunk at Kirkby, three miles north-west of the Knowsley station. The water will be conveyed in 15-in. pipes from Kirkby to Knowsley, where it will join the Knowsley water, the whole to be carried in 21-in. pipes to Portico, where a junction will be effected with the existing mains, which at present supply the Brownedge and Eccleston mill-surface reservoirs, whence it will be distributed to the town.

Stafford.—The Stafford Town Council on the 17th ult. held a special meeting to take into consideration the advisability of applying for an Act of Parliament to obtain a water-supply from Cannock Chase. A desultory discussion took place in committee, the general feeling of the Council being apparently against going to the expense of a fresh Act. A resolution was ultimately carried, that samples of the pump-water of the town should be analysed, in order to see what improvement had taken place since the adoption of the tub system, and that the meeting should be adjourned for a month. A pretty general feeling seemed to exist in favour of making further attempts at the bore-hole on the common, by employing a first-class practical firm to sink a shaft down past the difficult salt deposits, to tub the latter out, and then make a heading over the 750 ft. of bore-hole relinquished by the first contractor.

HARBOUR WORKS.

Berwick.—The report on the scheme for the proposed fishery harbour at Green Haven, prepared by Mr. J. Watt Sandeman, C.E., Newcastle-upon-Tyne, shows that he proposes to construct the harbour in three sections, the first, or northernmost, being two acres in area, and the second and third each three acres, making a total of eight acres. The depth of the entrances, which are to be protected by outer and inner piers, would be 7 ft. below low water, or 22 ft. below high-water level of spring tides,—a depth which exceeds that of any harbour between the Tyne and the Forth. The area of the quays around the harbour would be about 8¾ acres. The levels of the ground adjacent are such that a branch railway could be made without difficulty. The North British Railway Company have been applied to, and it is expected they would construct the branch railway, which would be only 900 yards in extent. The Duke of Northumberland assents to the project, and has agreed to grant, at a rent of 12*l.* a year, 4¼ acres of land adjoining the proposed harbour, including his interest in the harbour as lord of the manor. Mr. Sandeman estimates the cost of making No. 1 harbour and the piers between Nos. 2 and 3 harbours at 24,743*l.*, and the cost of No. 2 harbour and the pier between it and the first at 23,891*l.*, and the cost of No. 3 harbour at 15,317*l.*, or a total of 63,951*l.* Mr. Sandeman points out the great railway facilities Berwick enjoys, and which are essential for the development of a first-class fishing port. There are in all thirty-four opportunities of despatching fish from Berwick in the twenty-four hours, twelve of which are by fast trains.

Burntisland.—The sea-wall on the foreshore

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street.

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west of Burntisland Harbour, which has been erected by the Harbour Commissionsrs for the purpose of enclosing ballast, and reclaiming ground thereby, has just been completed, after a twelvemonth's labour, at an expense of about 3,000*l.* The contract for reconstructing the point of the breakwater and widening the harbour entrance is proceeding satisfactorily. Other works in progress are: extension of quay wall at dock-head; dry stone rubble embankment at head of tidal basin: and repairs to roundhead at dock entrance, all of which are being carried out by Mr. Chalmers.

Montrose.—On the 16th ult. a special meeting of the Montrose Harbour Trustees was held to receive the report of the committee appointed to consider as to the construction of a new pier from the corner of the east quay to the outer corner of the wet dock protection wall. The committee, after discussion, resolved to approve of the large plan reported on by Mr. Cunningham, the engineer, the probable cost of which he at first estimated at 6,100*l.*, and now at 5,750*l.*, with a new pier about 550 ft. in length, extending from the outer corner of the east quay to the outer corner of the dock protection wall. The report was unanimously adopted.

St. Ives.—A meeting of fishermen and others interested was held in the Town-hall, St. Ives, Cornwall, on the 13th ult., to consider a scheme for the improvement of the harbour. Captain Jacob Care, who presided, said,—A scheme has been discussed here at various times for the improvement of our harbour. It consisted in the addition of 250 ft. to the present quay, pointing in the direction of Hayle Bar. There have been some amongst us who did not altogether agree with that scheme, and after a great deal of deliberation on the matter another has been prepared. It is that a pier of 900 ft. in length be extended from Pednolver in the direction of Smeaton's pier. This would leave an opening of 220 ft. for the mouth of the harbour. In addition to this it will be necessary to strengthen the present wooden pier that it may act as a breakwater, and the effect of this will be to throw the sea, which would otherwise come into the harbour, on to the back of the proposed southern pier. After discussion, it was resolved to approve of the new scheme as being the best, but that the opening be reduced from 220 ft. to 180 ft.

SCOTCH NEWS.

Falkirk.—The work in connexion with the erection of the new Post-office is going on quickly, and it is expected that the building will be ready for occupation by the Post-office authorities some time in the month of April. The building will have a frontage to Market-street of 47 ft., and will be (says the *Falkirk Herald*) "of a plain style of architecture." The depth will measure 39 ft., while the height above the footpath will be 40 ft. The ground-flat will be exclusively devoted to the requirements of the Post-office, while the upper flat will consist of two dwelling-houses approached by a front entrance in Market-street. The following are the names of the successful contractors:—Mason, Mr. J. Gardner, Falkirk; joiners, Messrs. J. & A. Main, Falkirk; slater, Mr. James Walker, Falkirk; plasterer, Mr. D. M'Nair, Falkirk; plumbers, Messrs. Philips & Bruce, Glasgow; ironfounders, Messrs. Christie & Smith, Glasgow.

Galashiels.—A contract has been signed between the proprietors of Buckholmside Skinworks and Messrs. R. Hall & Co., for the reconstruction of that portion of the works which was destroyed by fire in May last. Messrs. Aimers, engineers, have been successful in securing a contract for a large share of the iron work. The erection of a wool store for Buckholm Mill has also been commenced. The building will be 144 ft. long, 24 ft. wide, and two stories in height. The contractors are Messrs. J. & J. Hall.

Montrose.—The new Freemasons' Hall, at Montrose, was opened on the 14th ult. The plans were prepared by Mr. John Sim. The hall, which is situated about the middle of the New Wynd, on the south side, is capable of holding comfortably about sixty persons. The building is a two-story one, the ground flat being divided into two shops. The following were the contractors:—Mason, Mr. John Valentine; joiners, Messrs. Milne Brothers; plumbers, Messrs. Colin Wood & Co.; plasterer, Mr. William Grant; slater, Mr. Robert Keillor.

Paisley.—On the 18th ult. Mr. Thomas Coats, of Fergusiie, handed over to the keeping of the Paisley Philosophical Institute, for behoof of the community, a new observatory, erected by him on Oakshaw-hill, and fitted up with a complete set of instruments. He has besides given an endowment of 2,000*l.* for its upkeep. The full value of this gift is stated to amount to over 10,000*l.*, and it may be added that during the present year the community of Paisley have been presented by townsmen with property to the value of not much short of 150,000*l.*

Haddington.—In the Haddington Sheriff Court, Mr. Whitelaw, architect and surveyor, Edinburgh, sued the Ormiston Local Authority for 59*l.* 16s. 1½d. as remuneration for his services in connexion with the drainage of the village of Ormiston. The Local Authority resisted the demand, and tendered first 20*l.*, and thereafter 25*l.*, as in full. Parties agreed to refer the matter to Mr. Black, architect, Haddington, who reported that, in his opinion, 30*l.* was a fair and even liberal allowance. The Sheriff-Substitute has therefore decerned for that sum, and, under the circumstances, found neither party entitled to expenses.

GLASGOW.

The Work of the Improvement Trust.—At the meeting of the Glasgow Town Council, on the 19th ult., on the minutes of the Improvement Trust coming up for consideration, Councillor Smith expressed his regret that back-to-back dwelling-houses were to be erected in Claythorn-street, on Trust ground. Sir W. Collins submitted a statement on the position and prospects of the Trust. The surplus of assets over liabilities was 1,260*l.* 9s. 7d. on the whole affairs of the Trust. The cost to the ratepayers up to May last had been 403,000*l.* On hand they had property to the value of 700,000*l.* During the past three years they had only succeeded in realising a portion of it, worth 4,549*l.* The process of reduction had been a very gradual one indeed, and the time had now come when they might make a step forward. It was to be feared that their property would be subject to a depreciation of no less than 100,000*l.* During the time taken in its disposal there was an enormous amount of interest to be paid on unoccupied spaces. In fact, the greater part of the assessment had been swamped in payment on unproductive ground. The loss in the course of the next fifteen years, and affairs could not be closed earlier, would make the total cost to the ratepayers 600,000*l.* It had been urged that the Trust should have provided dwelling-houses for the working-classes. The hope that was held out that cheaper houses would thus have been provided was a delusive one raised for special purposes. Perhaps the greatest blunders made in the history of the Trust was the depopulation of too many districts at once, and the imposition of the entire expense of the operations upon the occupiers of houses. In conclusion, he urged that they should change their policy to the extent of accepting the market value for their ground when they were offered it. No action was taken in the matter.

The Population of the City.—At a meeting of the Town Council, held on the 23rd ult., for the transaction of police business, Dr. Russell, the medical officer, in his fortnightly report, stated that while in ten years the population of Glasgow had only increased 4 per cent., there had been 3·35 per cent. added last year. He also pointed out that, by the present mode of calculation, the Registrar-General would, in 1890, estimate the population at 530,451; while there was the best reason for believing it was already 531,200.

PROVINCIAL NEWS.

Darlington.—Oakwood Croft, near Darlington, the residence of Mr. C. G. Johnson, J.P., has just been rebuilt, under the direction of Mr. G. G. Hoskins, architect, Darlington.

Derby.—The new Art Gallery here will be formally opened this Saturday, November 4th, but will not actually be available for the permanent exhibition of works of art until early in 1883. The committee desire that a special feature of the first exhibition next year shall be a large collection of the works of Wright, of Derby. The great ability of this artist, and the number of his works locally owned, should ensure this being a most attractive exhibition, whilst it will have the stamp of local speciality.

Weston-super-Mare.—The Weston-super-Mare Town Council have accepted the offer of Mrs. Henry Davies to give land valued at 7,000*l.* as a people's park.

Preston.—Last week, at the annual meeting of the Preston Industrial and Orphan Home Society, the committee reported that the Harris Trustees had agreed to erect and endow an orphanage which should be an ornament to the town, and worthily perpetuate the name of the late Mr. Harris. They had, therefore, decided to devote the magnificent sum of 100,000*l.* to that purpose, of which they proposed to utilise 28,000*l.* in the erection and the furnishing of the orphanage, and 72,000*l.* for endowment purposes. The site chosen is 28 acres of land in Garstang-road, of which 12¼ acres have been offered to and accepted by the Harris Trustees, and the remaining 15¾ acres have been re-sold. The total cost of the site is 2,600*l.*——On the 26th ult., at the meeting of the Preston Town Council, Alderman Gilbertson moved "That the entire undertaking of the Ribble Navigation Company be purchased for the sum of 72,500*l.*, free from all incumbrances, and that application be made to Parliament in the next session for an Act to authorise the purchase and transfer, the undertaking to be taken over and the purchase-money paid within three months from the passing of the Act, the company undertaking to maintain the river walls, embankments, and property in a proper state of repair, and to hand them over in as good repair, order, and condition as they are in at present, and the council to undertake to pay the company's costs of and incident to the application to Parliament, a provisional contract to be entered into within six weeks from this date"; and also, "that the Ribble Committee be requested to report to the Council as early as possible the improvements in the river Ribble and the quays and walls thereof, for which they deem it advisable that the sanction of Parliament should be obtained in the next session." This was agreed to by 29 to 10.

Hyde (Lancashire).—On Saturday last the foundation-stone of the new Reform Club, which is about to be erected for the accommodation of the liberals of Hyde, was laid by Mr. Thomas Ashton, mayor of the borough. The site of the new building is at the corner of Market-street and Foundry-street, the main frontage being to the former street, and the style in which it is to be erected is that known as "Queen Anne." The materials to be used in the construction of the external fabric are red terra cotta bricks, with Yorkshire stone dressings, and over the principal entrance, in Market-street, there will be a tower containing a clock with transparent dials for night illumination. This tower will be 63 ft. in height from the basement. At the corner of the building, abutting on Market and Foundry streets, a balcony will be placed for the convenience of those desiring to address crowds outside the club. The architect is Mr. W. Telford Gunson, of Manchester, and the work has been entrusted to Mr. Peter Green, of Hyde. The cost is estimated at about 3,000*l.*

SEWER PIPES.

An improvement in the jointing of sewer-pipes has been made, and patented, by forming a "rest" on the outer edge of the inside of the socket, for about 6 in. in width at the bottom, upon which the spigot ends of the pipes lie, and which is formed in one with the pipe. Upon this projection, or "rest," the end of the pipe lies at its proper level, but in the common sockets it drops down below the level of the adjoining pipe, and in the case of heavy pipes, in making the joint, the spigot end is not held up to its proper level while the joint is made under it. The rest being formed on the outer edge of the inside of the bottom of the socket, the jointing material is placed behind it, and when the spigot end of the pipe has been laid in upon the rest, the joint is made continuous in the usual way. It is a great safeguard against bad workmanship in that part of the joint where it ought to be most perfect.

The Builders' Benevolent Institution Dinner took place at the Freemason's Tavern on Thursday last, the 2nd inst., Mr. J. T. Chappell, president, in the chair. The total amount of the subscriptions and donations announced during the evening was 1,639*l.* 8s. [illegible] our report until next week.

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CASES UNDER THE EMPLOYERS' LIABILITY ACT.

SCOTT *v.* BRASS.

AT the Clerkenwell County Court, on the 26th ult., before Mr. Gordon Whitbread, judge, a scaffolder named William Henry Scott, of Berkeley-street, Clerkenwell, sought to recover from Mr. Deputy Brass, builder, of 47, Old-street, 50*l.* compensation for injuries received whilst in the employ of the defendant, and in consequence of the alleged negligence of a foreman in defendant's employ.

The case for the plaintiff was that he was injured and incapacitated from following his employment for six weeks in consequence of a portion of defendant's scaffolding at Monument-yard not having been properly secured.

This was positively denied by the defendant's witnesses, they stating that the men were ordered to secure the poles rather than otherwise as stated by plaintiff and his witnesses.

The Judge said, although the evidence was most conflicting, he was inclined to give credence to the defendant's case, and found in favour of the defendant, with costs, to be taxed and paid within fourteen days.

O'GRADY *v.* PERRY AND CO.

THIS case was heard before his Honour, Judge Dasent, at the Bow County-court, on Monday, October 23rd.

The plaintiff sued Messrs. Perry & Co., contractors, Tredegar Works, Bow, under the Employers' Liability Act, for the recovery of 150*l.* for personal injury and loss of time sustained by plaintiff, in consequence of an accident in the erection of "Queen's Mansions," Victoria-street, in March last. The plaintiff was a scaffolder, and alleged that he was at work under the orders of one Cashman, his foreman; that by his instructions he was placed in a certain position where scaffolding was being struck, to warn people from passing under it; to do this, he had to stand near a stage which was being used for a barrow-hoist for hoisting concrete for fire-proof floors, &c., and one of the barrows, in ascending, struck against one side of the horse-run, which caused it to rebound, and so it went swinging a little to the top, and there caught the end of one of the planks on the top of the stage, which loosened another plank at the back of it, the latter falling end-down on to the plaintiff's toes, and so damaged them. The plaintiff was sent at once by the defendants into the hospital, and they paid him some sums of money, although they considered they were not at all liable for the accident, and also offered to let him come to work again at full wages. The plaintiff, however, had been advised by his relations that he had a claim under the Employers' Liability Act, and that, if he went to work again till the action was brought and settled, it would be at his peril, whereupon he brought the action.

The plaintiff was himself engaged in making the stage which, he alleged, was left all right by him, but that some carpenters' labourers had moved some of the planks after he had left it. It turned out that Cashman was only a working-man, and was not defendants' foreman, he being simply a leading scaffolder. The plaintiff's counsel contended that Cashman had no right to tell the plaintiff to stand in a dangerous place such as that near a barrow-hoist.

The Judge held that the defendants had taken proper precautions in placing a man in the position the plaintiff was in to avoid an accident to other persons, and that it was absurd to hold the defendants responsible for an act which the plaintiff himself stated had been committed by some other labourers on the building not acting at all under the orders of Cashman, and who were, in fact, a separate gang of men altogether. His Honour, therefore, nonsuited the plaintiff.

USE OF BAD MORTAR.

FREDERICK TRIMM, builder, of Buxton House, Lower Sydenham, was summoned at the instance of the Metropolitan Board of Works for using in his building work at Bell-green mortar not composed of "fresh-burnt lime and sand or grit without earthy matter in the proportion of one of lime to three of sand or grit."

Mr. John Hebb, Assistant Architect to the Board, said he took samples of the mortar used by the defendant, and found it crumbled readily in the hand. On testing it with acid, he found it contained small proportions of lime and burnt ballast, and some bits of coal and very fine sand. It was almost in the condition of mud, and ought never to be used. One of the chimneys was out of the perpendicular.

The defendant called two witnesses, one of whom said the mortar used was not the best, but was as good as that used in "speculative building."

Mr. Balguy find the defendant 3*l.* and 12*s.* costs.

The Surveyors' Institution—The first ordinary general meeting of the Session will be held on Monday, November 13th, when the president, Mr. Edward Ryde, will open the Session with an address.

CONDITIONS OF CONTRACT.

SIR,—Some few years back the Royal Institute of Architects and the London Builders' Society, after several meetings and much discussion, arrived at an agreement as to what should in future be fair conditions of contract as between employers and building contractors. I am very sorry to say that some architects are now altogether breaking from this agreement, and seeking again to enforce such conditions as I think no builder should succumb to. I send below some conditions put forward by a leading member of the Institute of Architects, on which, it seems to me, comment is needless. Some builders refused to subscribe to these conditions, and their tenders were rejected.

A LONDON BUILDER.

Conditions in proposed Contract for new Council Chamber for the Corporation of London:—

"Should the architect at any time require the execution of the works to be suspended, either *wholly or in part*, the contractor is at once to comply with such request and will not be allowed any remuneration for loss or damage that may be sustained by him in consequence of such suspension.

No extension of time will be allowed in respect of a strike by workmen against the contractor, such strike not being general in the trade or trades.—Mem. The penalty for non-completion is 25*l.* a day.

Power to the architect to withhold all certificates until the completion of the contract.

On all points connected with the performance of the contract, the decision of the architect to be final and conclusive."

SEWER VENTILATION.

SIR,—In reply to Mr. W. P. Buchan, "Another Old Buffer" wishes to say that he was not aware that drains and pipes were gifted with visual organs. If Mr. Buchan will only point out the exact position where the organ of light can be found in his drains, "Old Buffer" will find out whether it contains a beam or not; as it happens, however, the private drains have only been relaid (within a short period), formed with good, socketed, earthenware pipes bedded on concrete, with a direct fall towards the sewer. If the private drains were stopped up, this fact would be discovered in a day, as by careful calculation "Old Buffer" finds that as much water is passed down the private drains as would entirely fill them in ten hours. A more effectual proof of the freedom of the drains from stoppage could hardly be found; and if Mr. W. P. Buchan can refer to a more reliable test let him do so. The fact still remains, however, that every time there is a heavy downfall of rain poor "Old Buffer's" house is almost rendered insufferable by odours of unquestionable sewage origin. As to the remark anent "rushing into print," "Old Buffer" wishes to remind Mr. W. P. Buchan of another proverb; *ergo*, "Those living in glass houses should never throw stones."

ANOTHER OLD BUFFER.

LAND STORM INSURANCE.

SIR,—Long before the recent gales, the owners of house property have felt the want of means to insure buildings against damage by tempest, and although the subject has been brought to the notice of the principal fire offices suggesting the addition of such a branch of business, they have declined to adopt it; therefore, a company, if established by men of high reputation, would, in all probability, prove advantageous to the proprietors and the public. As such visitations are, fortunately, not of frequent occurrence, the rates of premiums would be so low that landlords would readily avail themselves of the security, while the insurance company would have a profitable business, in which fraud would be impossible, as crime cannot create a storm, as it can make a fire.

GEORGE ELLIS.

CHURCH-BUILDING NEWS.

Reddish Green.—The new Church of St. Elizabeth, Reddish Green, near Stockport, which is being built by Mr. W. H. Houldsworth, at a cost of upwards of 20,000*l.*, will be ready for consecration early in the ensuing year. Mr. Alfred Waterhouse, A.R.A., is the architect.

Tidcombe.—The parish church of Tidcombe, Wilts, was re-opened on the 17th ult., after restoration. The church is of early foundation, but has at various times been much altered, having been in great part rebuilt at the beginning of the fourteenth century, and had the present roof of the nave and north aisle put on and the clearstory and upper tower altered late in the following century. More recently the brick porch and buttresses have been added, so that the only distinct feature of the original church now remaining is the Norman font. The Norman church at Tidcombe is supposed to have been built by the monks at Mottisfont, near Romsey, a monastery which was endowed shortly after the Conquest. Among the special features of the edifice is an arched recess in the north aisle, which in pre-Reformation times was known as the Easter sepulchre. At the east end of the same aisle a piscina has been disclosed, and also an aumbry, both of which have been carefully preserved. In the chancel, the whole of the stonework has been renewed, redressed, and pointed, and the floor laid with encaustic tiles. The chancel has been restored by the Ecclesiastical Commissioners, under the direction of Mr. Purley, from Mr. Christian's office. The contractor was Mr. Woodbridge, of Hungerford. In the course of the proceedings connected with the re-opening of the church, Mr. Walter Money said that when he first came to Tidcombe with his friend, Mr. Hawkins, he was struck with the interesting character of the church, and the distinctive features it possessed, and he felt exceedingly anxious that its restoration should be placed in careful and conservative hands: he therefore recommended that application should be made to the Society for the Preservation of Ancient Buildings, who reported upon the church, and he felt very glad to say Mr. Christian had carried out the alterations almost exactly on the lines recommended by the society. [We do not know whether Mr. Christian will regard this as a compliment.]

Stonehouse.—St. George's Church, Stonehouse (erected about a hundred years ago), was re-opened by the Bishop of Exeter on the 11th ult., after alterations. The work has been carried out from plans prepared by Mr. H. J. Snell, architect, Courtnay-street, Plymouth, and has included the erection of a chancel, organ-chamber, and vestry, and the re-seating of the ground-floor of the church. The pulpit, which stands just outside the chancel steps, and on the north side, is of somewhat large proportions, and on plan is sexagon, its supports being detached columns of polished Ipplepen marble. These columns, in their turn, rest upon richly-moulded bases of polished Devonshire black marble. The capitals surmounting the columns are of delicately-tinted grey polished marble, and upon these rests the soffit of the pulpit, which is a monolith, and richly panelled; around the soffit is a frieze of red polished marble, with bosses of polished green marble from the quarries at Yealmpton at every angle. Around the base of the body of the pulpit itself is a frieze of polished grey marble, and at each angle are pilasters of Ipplepen marble. The five main cants are enriched by sculptured representations of the four Evangelistic emblems, and of the Holy Spirit, symbolised by the descending dove. These panels are further enriched by rounded inlays of alabaster. The interior of the pulpit is lined with teak, and the approach to it is by a flight of stone steps curved on plan. The new font has a bowl of octagonal shape resting upon a circular shaft. The various panels are deeply moulded: it is composed wholly of Beer stone from the well-known quarries near Seaton. Both pulpit and font are the handiwork of Mr. Harry Hems. The work has cost about 2,000*l.*

Edinburgh.—St. John's Episcopal Church, Edinburgh, was re-opened on Sunday last, after enlargement. Consisting of a chancel, clergy and choir vestries, and a porch, the additions have been carried out in keeping with the Perpendicular style of the edifice. Originally it was intended that the chancel should have a square end, but circumstances arose which rendered that impossible, and it has, therefore, been made five-sided. The steps of the chancel, which are of marble, have been placed in line with the pillars that divided the old chancel from the nave, and in this way the interior of it extends to about 30 ft. A notable feature of the design is the arch erected over the site of the old east wall. It is about 50 ft. high. The roof is vaulted, with wooden ribs, the intervening spaces being painted in harmony with the old work. Of the five windows in the chancel, the east one has alone been permanently filled with stained glass. The central figure represents "Our Lord in Majesty," flanked on either side by the Virgin and St. John. Underneath these are representations of "The Ascension." "The visit of Mary to Elizabeth," and "The visit of the Angels to St. John at Patmos." This window was the gift of the widow and daughter of the late Mr. John Blackwood, in whose memory it has been erected. It was executed by Messrs. Clayton & Bell, London. The memorial of Dean Ramsay, which formerly stood in the [illegible] the south aisle, has

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now been placed on the south wall of the chancel. The cost of the works, which were designed by Messrs. Kinnear & Peddie, architects, has been about 3,500*l.*

Llanunda (*Fishguard*).—The ancient church of this parish, the one in which the French landed at the end of the last century, has just been re-opened by the Bishop of St. David's, after a very complete restoration. A rood-loft staircase, extending the whole length of the western wall of the north aisle, has been discovered and opened out, as well as a squint in the eastern wall of the south porch. The interesting double bell-turret at the west end has been straightened by mechanical means, under the guidance and instructions of Mr. Lingen Barker, the architect. The works have been performed by Messrs. Balcombe & Price, of Pembroke Dock. The chancel was rebuilt by the Ecclesiastical Commissioners.

Walsall.—The capitals of the nave arcading of the church of St. Michael and All Angels, Caldmore, have been carved in a handsome manner by Mr. Thos. Earp, of Lambeth; and a new stone pulpit of Early English design has been erected by Messrs. Jones & Willis, of Birmingham, under the superintendence of Mr. J. R. Veall, of Wolverhampton, the architect of the church.

Bickleigh.—The parish church of Bickleigh was re-opened on the 22nd inst., after extensive alterations. The church was rebuilt in 1838 by Sir Ralph Lopes, and the cost of the present works has been wholly defrayed by his son, Sir Massey Lopes, on whose estate the church lies. The intention of the recent works has been to supplement what was lacking, and to make it more suitable to the requirements and taste of the present day. The recent works consist of the re-arrangement of the chancel, with the addition of a marble pavement and of handsome oak stalls; new oak seats in the nave, the ends of which are panelled and carved; a new vestry and tower screen, and new glazing and plastering and general repairs have been done. The works have been carried out from the designs of Mr. Sedding. The builder was Mr. Cowling, of Bickleigh. The carving was done by Mr. Trevenen, of Buckingham-place, Plymouth.

DISSENTING CHURCH-BUILDING NEWS.

Woodberry Down.—The memorial-stone of a new chapel for the Baptist community has been laid in Woodberry Down, between Stamford Hill and the Seven Sisters-road, by the Rev. T. Vincent Tymms, President of the London Baptist Association. The cost of the new edifice, Early English Gothic in style, from the designs of Messrs. Paull & Bonella, architects, of Chancery-lane, is estimated at 6,500*l.*; the purchase-money for land, site, &c., 2,500*l.*; and when completed by the builders, Messrs. Allen & Sons, of Kilburn, accommodation will be provided for about 900 worshippers.

Edinburgh.—The new church erected by the Colston-street United Presbyterian congregation has been opened. The church has been built in thirteenth-century French Gothic style, and occupies an obtuse angle at the corner of Colston-street and Buchanan-street. The plan of the interior of the church is in the shape of a horseshoe, the auditorium being constructed not unlike that of a theatre. The ground-floor, which accommodates 500, excluding elders' seats, has a fall of 2 ft. from front to rear, and all the seats radiate so as to face the pulpit. The gallery is arranged to seat upwards of 300 persons, without overhanging more than one-third of the ground-floor sittings. The entrance doorway faces the angle of the street, and above it there is a large circular window, 12 ft. in diameter, filled with stained glass, the gift of Mr. Small, Murano-place. The window is surmounted by a lofty gable, 60 ft. from the pavement, and a slate spire with ornamental louvre ventilator rises to a height of 90 ft. The total cost of the erection will not exceed 3,500*l.* The church has been built from plans prepared by Mr. Andrew Dewar, architect, Edinburgh.

Perth.—The plan for a new church for the congregation of Free St. Leonard's have been prepared by Mr. J. J. Stevenson, London. The church will be situated in Marshall-place, between James-street and Scott-street, and erected in the later Scotch Gothic style of architecture, founded on old examples, such as St. Giles's, Edinburgh, Stirling, Linlithgow, and St. Monance, in Fife. In the area of the church there will be 545 sittings in pews, 53 in open seats, and 58 seats for the choir and elders, and in the gallery accommodation will be provided for 329 persons, making a total of 985 sittings. In connexion with the church there will be a hall seated for 309 persons. It is estimated that the buildings will cost between 7,000*l.* and 8,000*l.*

STAINED GLASS.

Jedburgh. — A stained-glass window, the workmanship of Messrs. James Ballantine & Son, Edinburgh, has just been put into Edgerston Parish Church, in memory of the late Mr. William Oliver Rutherfurd, of Edgerston, who, for the long period of sixty-one years, was Sheriff of Roxburghshire. The subject is that of the Good Samaritan.

Lerwick.—Sheriff Rampini, chairman of the Decoration Fund Committee of the Lerwick Town-hall, has received intimation from Mr. C. H. B. Hayfield of his desire to present a stained-glass window to the Lerwick Town-hall, now in course of erection. The subject will be James III. of Scotland, and the window will be executed, along with the remainder of the historical series, by Messrs. Cox, Sons, Buckley, & Co., of London.

Lower Norwood. — Messrs. W. M. Pepper & Co. have just placed in St. Luke's Church, Lower Norwood, a five-light chancel window, depicting our Saviour in the act of blessing, and the four Evangelists (two on each side). The window was presented by Mrs. Iredwell, a member of the congregation, in memory of her late husband.

Birmingham.—A window to the memory of the late Mrs. Julia Baker has been placed in the east end of St. Philip's Church. The subject depicted is the Crucifixion, treated in the Renaissance manner. An imposing canopy is formed, harmonising with the architecture of the church. The window is the work of Mr. Swaine Bourne.

Nottingham.—The large and lofty south transept window of St. Matthew's Church has just been filled with stained glass as a memorial of the late Mr. Wm. Moody. The window, of three openings, is of Early English architecture, and by means of bordures has been adapted by the artists to the illustration of four subjects. The lower three are, centrally, "The Last Supper," flanked on one side by "The Agony in the Garden," and on the other by "The Appearance of Christ to Mary after the Resurrection." Above these the whole upper portions of the window are devoted to "Our Lord's Ascension." The various subjects, with their accessory groups, selected in accordance with the Scriptural record, are vigorously delineated; and as the southern aspect permits and justifies, the colouring is more than usually rich. The window is by the firm of Powell Brothers, Leeds; Messrs. Walker & Howitt, of Nottingham, being the supervising architects.

Southport.—The Mayoress (Mrs. W. Sutton) has presented to Mornington-road Chapel a stained-glass window, the work of Messrs. Ballantine & Son, of Edinburgh. The principal subject is "The Lord's Supper," taken in the main from Leonardo da Vinci's well-known picture. As the height of the window afforded a favourable opportunity for a lower tier of figures, the subject of Gethsemane has been chosen for five smaller panels underneath. In the tracery are the Christian symbols of the Hand, the Lamb, the Dove, the Trinity, the Alpha and Omega, and in the cinquefoils immediately over the principal subject are the Sacramental elements symbolised by the Wheat and the Vine. The window cost 500*l.*

Hambledon.—The east window of the parish church of Hambledon, Hants, has lately been filled with stained glass in memory of the late Mr. Forrester Wilson, of Whitedale. It is the work of Messrs. Lavers, Barraud, & Westlake, of Endell-street, London. The subject is the Crucifixion, with the usual attendant groups, in the centre; the upper part, Christ in His Majesty, adored by angels; and beneath, the Last Supper, with groups representing two Old Testament Types of the Eucharist, the Manna on one side and the Grapes of Eschol on the other.

Acton-green.—The three-light east window of Aston-green Mission Church has been filled with stained glass. The subject (the Crucifixion) occupies all the lights. In the centre is our Lord on the cross, the Magdalen weeping at His feet. On the one side the prominent figures are those of St. John and the Centurion; on the other, those of the Virgin Mother and the other Mary. The window is by Messrs. Powell Bros., Leeds.

South Acton.—The last of the plain windows of All Saints' Church has just been filled with stained glass, "erected by the Clergy and Congregation in acknowledgment of great progress and many blessings" to commemorate the tenth anniversary of the church opening. This (aisle) window is of three lights, of which the subjects are—1. Noah's Sacrifice after the Flood; 2. The Confusion of Tongues at Babel; 3. Job in his Affliction. The window is by Messrs. Powell Bros., Leeds, by whom also is all the other stained glass in this church.

Miscellanea.

Proposed Additional Workhouse Buildings at Newington.—At the meeting of the Guardians of the St. Saviour's Union on the 26th ult., the report was brought up of the special committee appointed to consider the most economical means of providing for the indoor poor of the Union. The committee, after a lengthened inquiry, and going through the statistics of the pauperism of the Union for past years, have arrived at the conclusion that it is necessary to provide indoor accommodation for 500 over the number for which the establishments at the disposal of the Guardians are at present certified for, and with the view of ascertaining the best means of giving effect thereto, your committee sought the assistance of Mr. Jarvis, architect, who on many previous occasions has been referred to by the Board in similar matters. The interviews the committee have had with that gentleman have enabled them to prepare two alternative plans, both of which show that it is practicable to provide the required accommodation upon a portion of the land already in the occupation of the Guardians at Newington, coupled with the acquisition of the five houses lying between the boundaries of the infirmary and the Westmoreland and Boyson roads, which, if necessary, could be obtained under compulsory powers. From inquiries which the committee have made, they believe that the adoption of either of these plans would not entail an expenditure exceeding 25,000*l.* to 28,000*l.* The chairman moved that the report be adopted, and the plans sent to the Local Government Board. This was unanimously agreed to.

Tate's Electric Engine Stopper.—Among the numerous applications of electricity in connexion with machinery is one which has been applied by Mr. Tate, the manager of some large woollen mills in Bradford, to the purpose of stopping steam-engines in case of a breakdown of machinery or other accident in factories, or in the event of an impending collision on board steamship. The apparatus consists mainly of a weighted suspension-rod, an ordinary Leclanché battery, an electro-magnet and conducting wires leading to any number of points from which it is desired the engine shall be controlled. The electro-magnet is placed in a small box at the top of the stopping apparatus, which is connected with the stop-valve of the engine. Should an accident occur to the machinery in any part of the factory where the electric push is fixed, upon the button being pressed and contact made the electro-magnet acts upon a lever, which releases the weighted suspension rod. This rod instantly descends by gravity, and in its descent it opens a three-way cock, by which means steam is admitted from the boiler to a cylinder containing a piston, which latter is raised, and, in rising, closes the stop-valve and shuts off the steam.

Guildhall.—The Council-chamber here has been ventilated by Boyle's system, and a few days ago a number of gentlemen interested in such matters attended by invitation to inspect the arrangements. The invitation sent to us reached us too late to enable us to avail ourselves of it. We may, however, take an early opportunity of noticing the matter. In the meantime, we may say that very favourable accounts have been given by some of the gentlemen who have seen the arrangements. Sir J. B. Monckton, for example, the Town Clerk, has given a strong testimonial as to their success.

Loosening Screws.—A Continental mechanical journal states that for loosening rusted screws and other connexions, kerosene oil or naphtha, or even turpentine, will penetrate into the smallest fissures between connexions which have been for a long time in contact with each other. By exposure to the fire the parts then soon become disunited.

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A New Idea for London Gardens.—Ivy lawns are known to but few amongst the many who are interested in garden economy. They consist, as the name implies, of ivy only, and they offer some peculiar advantages in cases where grass lawns are apt to occasion more trouble than they are worth. An ivy lawn may be well made in one season, and if the primary operation of planting be properly performed the lawn will make itself; it will want no cutting, no sweeping, no watering, no protection, from the birds that eat the grass seeds to-day and to-morrow scratch up the tender plants, as though it was their mission to make grass lawns impossible. And when made, being, as it were self-made, an ivy lawn will take care of itself for any number of years; but if in need of repair or trimming, the knife, the shears, or the spade may be used with good effect by unskilful hands, and with the least imaginable cost of time, for it is not an easy thing to kill, or even to seriously injure, a lawn consisting of ivies solely. Such lawns are unfit for games, and, indeed, should not be trodden on. They will not, therefore, supersede grass in a country garden, which perhaps is a matter for gratulation; but they will give us the most delightful breadths of verdure in thousands of places where grass is more plague than profit, and, at the very best, tends rather to disgrace than adorn the position. In town gardens generally, where small patches of ill-kept grass tell us but too plainly that a garden is not necessarily an advantage, the ivy lawn would make all the difference between a too evident failure and a complete success. So again in spots shaded by trees, where usually we see bare earth, and it is confidently said that nothing will grow, a surfacing of ivy may be as surely secured as the shade that renders grass impossible. And while with grass for a lawn we have but little choice as to colour, for the good lawn grasses are all green, with ivy we may have a great variety of colours, for there are ivies with creamy-tinted leaves and leaves splashed with gold-yellow, as well as dark-green leaves and light-green leaves. After observations and experiments extending over many years, however, we have concluded that the very best of all known ivies for the purpose is the one known as "Hibberd's Emerald," for it is literally always growing, and travels fast and far, and the colour of its fresh glossy leafage is a rich blue-tinted green, suggestive of the gem from which it takes its second name. It is, in truth, a delicious ivy at all seasons; it is the first to begin growing in spring and the last to cease growing in autumn, and, while it spreads freely and forms a close felt of rich herbage on the ground, it will climb and cling wherever it touches a perpendicular surface, and thus, without being directed, it will quickly clothe walls and pillars and trees with its ever-fresh and lovely leafage. But the well-known Irish ivy is a valuable carpeting-plant, and is at command everywhere for the purpose.—*Gardeners' Magazine.*

Drainage at Portsmouth.—At the meeting of the Portsmouth Town Council on the 27th ult., a letter was read from Mr. G. C. Adames, Borough Engineer, resigning his position, assigning ill-health as the cause of his taking that step. The resignation was not accepted, but Mr. Beaumont was appointed to undertake the duties of the office *pro tem.* Grave complaints are made as to the condition of the drainage of the town, it being alleged that the drains have become choked through the negligence of the Borough Engineer and those under him. On the other hand, it is hinted that the Borough Engineer has had pressure brought to bear upon him to send in his resignation, and so become a scapegoat for the remissness of the Sanitary Committee. A special committee of inquiry has been appointed. The calm consideration of the question seems to have been somewhat interfered with by the propinquity of the municipal elections. The *Hampshire Telegraph*, commenting on the matter, says that the defective condition of the drainage is universally admitted, and although conflicting opinions are entertained as to the best means of remedying the evil, it is only too certain that any plan whatever will involve a very large outlay.

Peterborough—Mr. W. Matthews, Assoc. M. Inst. C.E., who has for some time been connected with the Peterborough Corporation, has been appointed Borough Engineer. The Water and Sewage Works recently constructed have cost 200,000*l.*

American Patents.—The report of the Commissioner of Patents at Washington for the fiscal year ending June 30th of this year shows that the number of applications for patents during that period was 28,883. Patent rights in the United States, however, not being granted in the same indiscriminate manner as in England, a large number of the applications were refused on the ground of the alleged inventions having been anticipated or for other stated reasons. The number of patents granted as a matter of fact was 17,713. The receipts of the office for fees, &c., were $930,864, and the expenditure (not including printing), $651,719. The commissioner recommends that an Act of Congress should be passed to determine the length of time for which a patent may be issued for an invention already patented in a foreign country.

Drawings by John Leech.—At a recent *soirée* of the Manchester Literary Club a suggestion was made as to the desirability of obtaining, by public subscription, a selection of drawings by John Leech, similar in character to the series now in the South Kensington Museum, to be offered in the first instance to the Manchester Corporation for the permanent art gallery of the city. This suggestion was warmly approved, and a subscripton-list was opened in the room, to which about fifty of the gentlemen present at once contributed. It is hoped that the public response to this effort may result in the purchase of the whole of the remaining works, in which case selections could be made and placed not only in Manchester, but in Liverpool, Leeds, Sheffield, Nottingham, and other large towns.

A Great Strike of Cabinet-makers in Paris is imminent. A few evenings ago 482 masters met to deliberate on the measures to be taken in regard to the threatened strike. The main point on which the masters and men are at issue is the system of placing masters on the "index," and of settling disputes with a general executive committee of the workmen. At the meeting were described the terrors of the "index." M. Allard, one of the leading cabinet-makers, summed it up as amounting to the bankruptcy of the employer. The lock-out, in case of a suitable arrangement not being effected, was adopted by 212. Sixty-two voted against it, and 208 abstained from voting. The workmen on their side held a meeting to take counter-measures. A conference between deputations of both sides has been held.

The Carlyle Statue.—On the 26th ult. the statue by Mr. Boehm, which has been erected on the Chelsea Embankment, as a memorial to Thomas Carlyle, was unveiled by Professor Tyndall. Shortly after the death of Carlyle, some of his friends commissioned Mr. Boehm to execute in bronze a replica of the statue he had modelled from the life some six years before. The statue had pleased Carlyle at the time. It represents Carlyle wrapped in a loose dressing-gown, seated in his arm-chair, his legs crossed, and his long characteristic hands folded on his lap. It is erected in the little public garden on the Chelsea Embankment, at the end of Great Cheyne-row, where Carlyle had spent the last forty years of his life.

Competition: Hull.—A new Savings Bank is to be built here, and the directors, at their meeting on the 25th inst., awarded the premium of twenty guineas to the design bearing the motto "Frugality," submitted in public competition. Thirty-two designs were received, and Mr. Robt. Clamp, A.R.I.B.A., of Hull, is the author of the selected design. The estimated cost of the building is 4,000*l.*

International Exhibition of Fine Arts, Rome.—The General Commission for the International Exhibition of Fine Arts have approved the proposal of the Executive Committee to postpone the opening of the Exhibition to the 14th of January, 1883, and to prolong the period for the delivery of works until the 1st of December next.

Cranford.—The corner-stone of new buildings to be used as a church school-room, &c., with mistress's residence, was laid on last Friday week by Mr. O. E. Coope, M.P. The building is Gothic in style, but freely treated, and is being erected from the designs of Mr. Robert Willey, F.R.I.B.A., of 66, Ludgate-hill.

Japanese Art was treated by Mr. Pfoundes in two lectures at the Royal Institution, Manchester, on Monday and Wednesday last. The errors of the passing fashion and the blunders of imitators were somewhat strongly criticised in unmistakable language by the lecturer.

TENDERS

For erecting a new hall, to be called the Albany Hall, in Fife-road, Kingston-on-Thames. Messrs. Robbins & De Boinville Brothers, architects, 2, Victoria Mansions. Quantities supplied:—

J. Higgs	£5,741 0 0
Martin, Wells, & Co.	4,670 0 0
M. Manley	4,667 0 0
W. Lane	4,585 0 0
Hoglen & Co.	4,500 0 0
J. Macerostie	4,490 0 0
J. Collings	4,455 0 0
J. Jarvis	4,275 0 0
Allen & Sons	4,225 0 0
G. Merredew	4,200 0 0
J. Piller	4,147 0 0
E. Wells	3,926 0 0
C. Oldridge (accepted)	3,872 0 0

For the erection of Nos. 18 and 19, Regent-street, Swindon, for the Hon. and Right Rev. Dr. Clifford. Mr. W. H. Read, architect, Corn Exchange, Swindon:—

Jackson	£915 0 0
Henley	896 0 6
Barrett	885 16 0
Wiltshire, Swindon (accepted)	882 10 0

For building new stables at Newmarket for Mr. Saich. Mr. J. Flatman, architect, Newmarket:—

Kerridge & Shaw	£1,305 0 0
Kent	1,170 0 0
Hook & Tebbett	1,117 10 0
Simpson	1,080 0 0
Cowell	998 0 0
Denson (accepted)	907 0 0

For alterations to wharf in East Ferry-road, Millwall, for the London Guelph Patent Cask Company. Mr. E. C. Allam, architect, Romford:—

Abel Philbey	£113 0 0
George Gibbs (accepted)	90 0 0

For the erection of a factory for the London Guelph Patent Cask Company, Millwall. Mr. E. C. Allam, architect:—

G. H. West (accepted)

For the erection of a baker's oven at No. 11, Sunford-lane, for the Incorporated Society of Licensed Victuallers. Mr. H. I. Newton, architect, 27, Great George-street:—

Cook	£100 0 0
Pickersgill Brothers (accepted)	95 0 0

For a central lighting station at Pimlico for the Swan United Electric Light Company, Limited. Mr. John Slater, B.A., architect. R. E. Crompton & Co., engineers:—

E. S. S. Williams & Son	£4,100 0 0
Peto Bros.	4,024 0 0

For new Council-chamber, Guildhall. Mr. Horace Jones, architect. Quantities by Messrs. Reddall & Son and Messrs. Williams & Gritten:—

Ashby Brothers*	£38,500 0 0
Thompson, Peterborough	37,892 0 0
Chappell*	37,850 0 0
Webster	35,900 0 0
Conder	35,870 0 0
Ashby & Horner	35,445 0 0
Mowlem & Co.	34,926 0 0
Holland & Hannen	34,566 0 0
Lucas Brothers*	33,486 0 0
Colls	32,888 0 0
G. Trollope & Sons*	32,286 0 0
Nightingale (accepted)	32,249 0 0

* These four tenders were rejected in consequence of alterations in the wording of the lithographed conditions made by the contractors.

For new model dairy farm buildings, with manager's residence, &c., for the Express Dairy Company, Limited, at College Farm, Finchley, chief offices, Bloomsbury Mansions. Mr. Fred. Chancellor, 8, Finsbury-circus, architect. Quantities supplied by Messrs. Franklin & Andrews:—

Brass	£6,245 0 0
Glasscock	6,198 0 0
Morter	6,171 0 0
King & Son	6,105 0 0
Manley	6,097 0 0
Adamson	5,671 0 0
Brown	5,300 0 0
Steed Bros.	4,942 0 0

For the erection of a new schoolroom for seventy-two infants at Codsall, Staffordshire. Mr. J. R. Veall, architect, Wolverhampton:—

Barratt, Tettenhall	£246 0 0
Morris, Penn Fields	210 7 9
Stretton, Codsall	210 0 0
Collins, Tettenhall	206 0 8
Moreton, Codsall (accepted)	204 10 0

For the erection of an infants' school, Chadwell Heath, for the Dagenham School Board. Mr. John Hudson, architect, 80, Leman-street:—

A. Davey, Romford	£1,471 0 0
J. Abrahams, Romford	1,410 0 0
G. W. C. Death, Chadwell Heath*	1,212 10 0

* Accepted.

For factory and offices at Eagle Wharf-road, Hoxton, for Mr. F. Foster. Mr. Spencer W. Grant, architect, 63, Finsbury-pavement. Quantities by Mr. C. W. Brooks:—

Colls & Son	£2,435 0 0
Oxford	2,395 0 0
Nightingale	2,249 0 0
Downs	2,147 0 0
Jerrard	2,149 0 0
Lawrence	2,052 0 0
Groves	2,048 0 0
Atherton & Latta (accepted)	2,025 0 0

For alterations and fittings at 12, Great Russell-street Bedford-square, for Mr. C. J. Cardwell. Mr. H. E. Pollard, architect:—

Sage	£440 0 0
Howard & Daverel	350 0 0
Holburn	335 0 0
Ward & Lamble	286 0 0
Evans	268 0 0

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For works at the Fulham Infirmary. Messrs. John Giles & Gough, architects. Quantities by Messrs. Quilter & Hardcastle :—

Taylor & Grist	£53,500	0	0
W. Wheeler	53,000	0	0
W. Batson	49,630	0	0
A. Capsey	48,600	0	0
G. Gibson	47,884	0	0
J. Mears	47,200	0	0
Wall Bros.	47,059	0	0
Boyce	46,900	0	0
Lucas & Son	46,880	0	0
McManus	46,695	0	0
Greenwood	46,300	0	0
Crockett	45,951	0	0
Oldrey	45,696	0	0
Lovatt	44,888	0	0
A. Thorn	44,650	0	0
Booth	44,500	0	0
Holliday & Greenwood	44,307	0	0
B. E. Nightingale	43,756	0	0
W. Downs	43,673	0	0
Howell & Son	43,590	0	0
W. & F. Croaker	43,580	0	0
J. Mowlem & Co.	42,991	0	0
E. Bentley	42,200	0	0
Pickersgill Bros.	41,713	0	0
Kellett & Bentley	41,400	0	0
Johnson	41,100	0	0
Vernon & Ewens	40,983	0	0
Gibbs & Flew (accepted)	40,700	0	0

For road and sewer works on the United Land Company's Oaklands Hall Estate, West End Lane, Hampstead :—

A. Palmer	£3,020	0	0
Nowell & Robson	2,900	0	0
W. Crockett	2,800	0	0
J. Sheppard	2,800	0	0
Rogers & Dickens	2,797	0	0
J. Bell	2,690	0	0
Bottoms Bros.	2,585	0	0
E. & W. Iles	2,527	0	0
R. Finnegan	2,475	0	0
W. G. Harris	2,465	0	0
Tomes & Wimpey	2,458	0	0
G. Felton	2,439	0	0
J. Bentley	2,413	16	0
C. Killingback (accepted)	2,347	0	0

For Board School, Little Wild-street, Great Wild-street, W.C., for the School Board for London. Mr. E. R. Robson, architect. Quantities by Mr. W. H. Barber :—

Howard & Dorrell	£15,160	0	0
J. Outhwaite	14,204	0	0
F. S. Sargeant	13,820	0	0
Grover	13,615	0	0
Atherton & Latta	13,500	0	0
G. S. S. Williams	13,439	0	0
Higgs & Hill	13,384	0	0
Brass	13,210	0	0
Boyce	13,100	0	0
Nightingale	13,077	0	0
Hobson	12,962	0	0
Wall Bros.	12,288	0	0

For the erection of coach-houses, and alterations and repairs to Nos. 81 and 82, Gore-road, Victoria-park, for Mr. Lee. Mr. G. Chuter, architect :—

Jackson & Todd	£315	0	0
Wood	309	0	0
Thomerson & Son (accepted)	231	0	0

For new class-rooms for Vicar Lane Chapel Trustees, Coventry. William Tomlinson, architect, Coventry :—

J. Jephcott	£180	2	0
R. Barnacle	120	10	0
G. Storer	115	0	0
Blakeman & Son	104	0	0

For alterations and repairs at the Hop Pole, Pitfield-street, Hoxton. Messrs. W. E. Williams & Sons, architects. Quantities not supplied :—

Marr	£468	0	0
Anley	450	0	0
Staines & Son (accepted)	388	0	0

For the supply of cast-iron manhole covers (weight about 4½ cwt. each), with dirt-boxes complete, for the Bromley Local Board. Mr. H. S. Cregeen, surveyor :—

G. Waller & Co.	each	£2	17	6
T. Dean	,,	1	16	0
Laidlaw & Co. (accepted)	,,	1	15	9

For the Marlowe-road drainage works, for the Beckenham Local Board. Mr. G. B. Carlton, surveyor :—

J. Saunders, Lower Tooting	£660	10	3
Hollidge & Stewart, South Norwood	445	0	0
Beadle, Bros., Erith	411	17	0

For general repairs to Nos. 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, and 24, Collingwood-street, Bethnal-green, and cottage in rear of No. 24. Mr. A. Walton, surveyor, 90, Queen-street, Cheapside, E.C. :—

Dodd & Co., Uxbridge-road	£533	13	9
Feary, Kingsland	500	0	0
Everitt Bros., Bow	425	0	0
Aldridge & Jermy, Peckham	330	0	0
Pereira, Hackney	306	0	0
B. Cook, Stonecutter-street	287	0	0
Tanner & Co., Eastcheap	271	0	0
Brightmore, North Woolwich	249	0	0
Parker & Co., Walworth (accepted)	228	0	0
Barnes, Bethnal-green	220	0	0

For new road and sewer at Highgate, for Mr. Thomas Dence. Messrs. E. E. Croucher & Co., surveyors :—

Rayner	£1,485	0	0
Adams	1,475	0	0
Bell	1,299	0	0
Pizzey	1,255	0	0
Dunmore	1,213	0	0

For completing villa at Sevenoaks. Mr. Rowland Plumbe, architect :—

Mansfield	£1,850	0	0 !
Bray & Pope	1,750	0	0
Haywood	1,345	0	0
Dearing & Son	1,275	0	0
Owen	840	0	0 !

For additional billiard-room at the People's Coffee-house, High-street, Hanley, for Mr. W. Baker. Keales & Bradford, architects, Miles Bank Chambers, Hanley :—

Cornes, Hanley	£199	10	0
Clark, Hanley	158	0	0
Tildsley, Hanley	147	10	0
Ellis, Hanley (accepted)	138	0	0

TO CORRESPONDENTS.

R. J. H. S. (contrary to practice).—R. B. & Son (too late).—A. S. G. (we cannot look back).—T. S. (no such statement in our pages).—W. H. D. (thanks; not).—C. O. E. (we do not attempt to set our contemporaries right).—J. E. P.—P. G. S.—G. E.—R. & Co.—H. & R.—P. Bros.—I. B. A.—C. C. H.—H. H. S.—B. S.—S. F. C.—T. B.—G. T. C.—C. R. S.—W. H.—C. P.—J. S.—G. F. T.—J. R. V.—G. R.—J. S.—J. M.—F. C.—F. J. B.—C. S.—S. W. G.—W. E. A.—A. L.—H. J. S.—J. F.—M. A. S.—W. K.—W. G. B. Q.—D. K. & Son—J. B.—E. W. W.—W. & L.—H. & G.—W. M.—R. C.—W. T.—S. & Son—R. & Son—C. C.—E. J. H.

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The Builder.

Vol. XLIII. No. 2075. Saturday, November 11, 1882.

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The Value of the Services of the Architect as Regards the Food Supply of great Cities.

AMONG the various services rendered to the commonwealth by the architect and the surveyor, few persons will be inclined to rank the cheapening of food. We have, however, in the current number of the *Quarterly Review*, so signal an instance of the opposite state of things,—that is to say, of the enormous increase in cost, and waste in bulk, of nutritious human food, arising directly from the want of those facilities for sale and distribution which it is the function of the architect and of the surveyor to provide,—that the value of the services actually rendered in this respect by the profession assumes inconteatable importance.

A perusal of our article of the 14th ult., on "Food for the Million" (which, of course, was not published in time for such consultation), would have enabled the author of this sprightly and instructive article,—it is headed "The Fish Supply of London,"—to avoid the only serious error that we detect on perusal, viz., his view of the costly character of the long railway carriage. It is Mr. Spencer Walpole, not the writer of the article, who tells the extraordinary story, to which most readers will be apt to apply the term "Cock and Bull," of a van loaded with fish being driven round and round Billingsgate for eleven days, still with the same load of fish, with the result,—"The fish which it contained was, of course, ultimately condemned." We should think so. By what extraordinary hoax the Inspector of Fisheries to the Home Office could have been induced to insert in his report a tale of this kind,—calculated, as it is, to throw doubt on the accuracy or judgment of the whole report,—or how the *Quarterly* Reviewer can have cited it without comment, we cannot attempt to guess. But the staple of the paper is of a far different order.

Billingsgate Market, we are told by the Reviewer, has a frontage to the river of 200 ft. and a superficial area of 40,000 square ft. (or ·918 acres). But as this site contains seventeen shops, and, till very lately, two public-houses, it is obvious that the space left for market proper is miserably small. It is a pity that its area is not given by the Reviewer. Not only is the market itself so disproportioned to the wants of the trade, and of the metropolis, but the approaches are of the most stunted and barbarous description, allowing only two vans to pass abreast, so that "if a van is being unpacked at the market, one of the two streams of traffic is temporarily blocked."

The regulations of the market, it must be freely allowed, are as thoroughly calculated to make the worst of inefficient space, and intermittent approach, as the wit or folly of man could well devise; not that we take it that either wit or folly were the arbitrators in the matter. That function was fulfilled by another abstract personification, by blind and greedy "Vested Interest," our old enemy. And to effect this, first, no fish is allowed to be sold before the hour of five a.m.; and secondly, "when the clock strikes nine, the police interfere, and clear all the closely-packed vehicles, sometimes amounting to nearly 4,000 in number, out of the City, in order to make way for the ordinary day traffic of the streets." If the salesmen and frequenters of the market were undisturbed, we suppose that something would be going on within it from two to three a.m to ten or eleven p.m., that is to say, for twenty hours out of the twenty-four. To reduce the possibility of doing business at one stroke in the ratio of from 20 to 4 is a sample of that blind abuse of corporate power which has raised up such fierce opposition to what in their origin were very noble institutions.

Nor is "Vested Interest" content with inadequate space, inconvenient approach, and capriciously shortened time. As with the brickmakers, as with the cutlery-grinders, as with the divers,—at least not so very long ago,—the greatest possible amount of inconvenience, with no little risk to human life, is thrown in the way of landing the fish. If there be one object which it is, more than another, important to move in the most rapid mode, and without touch of human hands, from the hold or deck of a ship to the stall of the market, it is a box of fish. If there be any article of trade which it is more thoroughly easy to move in this way, by cranes and trucks, than any other, it is this same box of fish. How is it actually done?

"In front of the market, on the water side, there is a large floating pontoon, but the steamers are not allowed to come alongside it in order to unload, being compelled to lie off at a distance of nearly 100 ft. from the market quay, and to land the fish along planks thrown out from the steamer to a barge, and from this barge to the floating pontoon. Every pound of fish brought by steamer and landed from the river at Billingsgate is carried along these planks upon men's heads. Only two roads,—one from and one to the steamers,—are permitted to exist, and as the men have no choice but to follow each other, it is obviously impossible to land a large quantity of fish before the market closes at nine in the morning. The result is, that fresh fish are often thrown away, because it will not keep until four o'clock the following morning."

Is it possible to describe a state of things,—we can find no other word for it,—more thoroughly infamous, more disgraceful to the corporate authorities and to all those holding rule over the market? Four hundred tons of fish for every working day in the year are sent to Billingsgate Market. This is calculated by Mr. Birkbeck, M.P., to be equivalent to a drove of 1,000 fat oxen entering London every day. How much of the 400 tons actually makes its way on the heads of the water-side porters into the market we are not told. The quantity is limited to that which a file of men can carry along a rough plank between the hours of five and nine. During half the year, too, this barbarous system of porterage, which only needs to be conducted by women instead of men to be the very worst that could be adopted by any savage tribe, is carried on in the dark. "Accidents happen frequently, and occasionally there is loss of life." It would have been well if the reviewer had ascertained the number of men thus employed. We fully anticipate, from the experience attained in those cases of the most debasing, the most deadly, and the most dangerous work of which we have any previous cognisance, that it is these half-clad, hard-worked porters, who, in the dark winter mornings, at the risk of their lives, do the work of a quarter of a donkey a piece, that will be found the most strenuous supporters of so frightful a state of things. They probably are, comparatively speaking, well paid; as a single firm, the largest in the trade, has paid from 4,300*l.* to 4,850*l.* a year for this wretched colportage of their cargoes. So, to keep up, or rather to keep down, in a few hands, the remuneration for a wholly unnecessary porterage, life is risked on the one hand, and East London is starved on the other.

For East London is fond of fish. The "wet trawl fish" that is thus brought to Billingsgate is divided into two classes,—prime and offal. Prime consists of turbot, brill, soles, John Dory, and red mullet. Offal includes plaice, haddock, cod, skate, roker, whiting, sturgeon, hake dabs, thornback, and gurnard. "Roker," a term unknown to the naturalist, includes all fish of the ray family, except skate. It "is a favourite food of the working classes, to whom it could be supplied at 3d., or less, per pound." Is it not incredible that the vast population of East London so tamely submits to the daily "condemnation" and destruction, by tens if not by hundreds of tons, of a large portion of the fish that is actually brought to the verge of the market,—there to be destroyed—rather than put down a second plank for the London lazzaroni, or allow the natural business of the fisherman to be carried on, in the way of removing his cargo, during the proper and natural hours of labour?

All this wrong, waste, oppressive cruelty, and national loss would be impossible but for the small area of the market, and the utterly inadequate approaches. It appears to be a wanton, as it is a wicked, waste on the part of the City authorities. "In 1862, Mr. Horace Jones, the City Architect, suggested the only practicable scheme for making Billingsgate more

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accessible by land that has yet come before the Common Council. At an estimated cost of 88,000*l.*, he proposed to construct a new street, from the corner of Eastcheap and Fish-street-hill to Thames-street. The Common Council approved, and allowed the proposal to lie on the table, and when, twelve years later, the Improvement Committee of the City of London sought to give effect to the plan, the estimated cost had risen from 88,000*l.* to 525,000*l.*" So much for the economy of procrastination!

Of the plan now in progress for establishing a new riverside fish-market of at least 4 acres in extent in the parish of St. Paul, Shadwell, and of the persistent, though, happily, unsuccessful, opposition raised to the Bill authorising it in both Houses of Parliament, we are not now about to speak. One thing, however, does tell with force from the perusal of our article, which we recommend our readers to study,—it is, that there seem to be reasons, both many and good, for establishing a market for railway-borne fish, *not* on the river-side, but at some central position for other parts of the metropolis. At Billingsgate, if we may rely upon our authority, the supply of fish by railway does not seem to have increased the total supply of London; for the railway-borne fish had to struggle for admittance to the wretched market-place with the river-borne fish during the four hours to which supply was restricted. Therefore, the more fish brought by railway got in, the less time was there left for the admission of the water-borne fish! The subject is one on which it is a hard test of temper and of self-command to write. Of all the wicked and wanton oppressions from which the serfs in feudal times had to suffer, was there one at once so persistent, so wanton, and so wicked as the regulation of the fish-market at Billingsgate by the City of London?

OPENING MEETING, ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE opening meeting of Session 1882-83 of the Royal Institute of British Architects was held on Monday evening last in Conduit-street, Mr. Horace Jones, President, in the chair.

The decease was announced of the following members, viz., R. Lacon Sibley, Fellow, and T. E. C. Streatfeild, Associate.

The following gentlemen were balloted for and declared to be duly elected, viz.:—

As Fellows.—Mr. Charles Trubshaw (Associate), Architect, Northern Division of the Midland Railway, Derby; and Mr. William Henry Picton, of Liverpool.

As Associates.—Mr. Frederick de Jersey Clere, of Feilding, New Zealand; Mr. John William Simpson,* Mitre-court Chambers, Temple, E.C.; Mr. Arthur Sutton Gover,* Queen-street, Cheapside; Mr. Francis Hooper,* Beckenham; Mr. Nathaniel James Stanger,* of Tresillian-crescent, St. John's, New Cross; Mr. Charles James Tait,* of Highbury Park; Mr. Charles Steward Smith,* of Friar-street, Reading; Mr. George Alexander Thomas Middleton,* of Ryde Vale-road, Balham; Mr. Samuel Cuthbert Rogers,* of Bedford-row; Mr. P. Cowper,* of Frederick-street, Gray's Inn-road; Mr. E. W. Poley,* of Lady Somerset-road, Highgate; and Mr. R. W. Bousfield,* of Clifton-gardens, Maida Vale.

The President's Address.

The President then proceeded to deliver his opening address. After a few preliminary observations, he entered upon a review of the events of the past session, and went on to speak of the hopes and expectancies of the present one, and generally of matters now interesting the world of architecture and its sister arts. The Institute's losses by death had been more than ordinarily serious, first and foremost being a national rather than a merely professional bereavement in the vacating of the Presidential Chair by the death of Mr. Street. They were the more forcibly reminded of the sad event by the circumstance that at this very time arrangements were being made for the State opening of his greatest work, the most important national building completed since the Houses of Parliament. Had he lived to see the inauguration of the New Law Courts it might have been hoped that some special decoration in public recognition of his toil, skill, and genius might have been granted him. The audience was reminded of Mr. Street's earnest advocacy of the preservation of the City churches, and of his brilliant and exhaustive Opening Address last year. One further act remained for the Institute,—the placing of his memorial portrait on its walls. For though it had been often mooted that the custom of thus honouring their past presidents should not be allowed to harden into an inflexible rule, he felt sure none would be for making the break upon this occasion. In the New Palace of Justice its architect would have a monument in his honour, but that was no reason why the Institute should forego its right to a canvas memento of its illustrious president. Brief obituary notices were next given of two past vice-presidents, Mr. Decimus Burton and Mr. Mocatta, neither of them of late much spoken of in the profession, but both noted more or less in former times, Burton especially having been a ruling light and power in architecture half a century ago. Mr. Mocatta, although not so well known in the profession as Mr. Decimus Burton, always evinced a great love for his art, and took a very great interest in the well-being of the profession. In Mr. Anthony Salvin the profession had lost a member whose works of restoration at the Tower of London, at Cambridge, and elsewhere, were well known. The death of Mr. George Somers Clarke was too recent an event to allow of his being as yet adequately commemorated. The President had lost in him a special friend. He was a pupil of the late Sir Charles Barry, travelled through Italy, France, and Germany about thirty-six years ago, and wrote for the Architectural Publication Society. Tallis's Printing-house and other large mercantile buildings in the City were designed by him, and, together with some of his country-houses, especially one for the late Mr. Hermon, marked well his talent and originality. The accessions to the ranks of the Institute during the past year had been 42 Fellows and 223 Associates. Some of the papers read at their meetings had been more than usually interesting. The President instanced Mr. Hugh Stannus's on "The Artistic Treatment of Constructional Ironwork" as a most acceptable essay. Indeed, it might have been wished that the author could have had more time allotted to him; but they were willing to accept it as a prelude to a future paper on the same subject, which might be further developed to the great advantage of them all. Mr. John Slater's paper "On Recent Progress in the Electric Lighting of Buildings" was, perhaps, even a more popular production of the session. The practical utility of the subject, the interest felt and shown by all in the wonderful adaptation of science to the wants of the whole world, an interest resulting in so many National and International Electric Exhibitions; and the pleasant way in which the whole was popularised, could not fail to charm and instruct the audience. The President did not wish his special allusion to these two papers to be understood as a depreciation of other communications. Reference was next made to the Institute's important labours for adjustment of the vexed question of light and air. The report was not yet ready for presentation to the members, but when produced it would be found, the President believed, useful, valuable, and exhaustive. Many minds had been brought to bear upon the problem, and to harmonise the various views they had taken of it, so as to reduce them into an orderly and useful digest, required time, care, and discretion. Two or three other questions before the Council had in like manner long waited to be reported on, not from any supineness on its part, but with a view to make the reports as perfect as possible.

The session of 1881-2 would long be memorable for the inauguration by the Institute of its system of compulsory Examination. The Council, having seriously weighed the question, had come to the determination that they would begin with an examination neither too strict nor too exhaustive. After complimenting the examiners, with special mention of Messrs. Grüning, Mathews, Robson, Watson, and others, the President remarked that at present their *curriculum* might be truly described as a preliminary one, not insisting on more knowledge than was absolutely indispensable to any aspirant to employment as an architect. He was firmly convinced, however, that whilst it would be both practicable and wise to extend the range and to increase the stringency of the examination, it would have been impolitic and injudicious to make a fresh start from such a high level as to necessitate the lowering of their standard. Very much remained to be done in future years, not only by the Board of Examiners, but also by the candidates themselves. Every candidate should be encouraged to pass as an Associate before aspiring to be a Fellow. The examination must be scientific and practical rather than æsthetic. Art could not be tested in the same way as arithmetic, and what Cowper said of a poet was no less true of an architect,—

> "A poet does not work by square or line,
> As smiths and joiners perfect a design."

Perhaps there was no better test of art knowledge than the numerous and valuable prizes offered for competition by the Institute. The President spoke highly of the good work done by the Architectural Association in preparing for the examination many of the best candidates. The Royal Academy was able to award even more valuable awards and honours than the Institute, and he believed they were always given with great care and appreciation. The *curriculum* of the Academy's Architectural School, under Mr. R. P. Spiers, a friend and Fellow of the Institute, showed that in many branches of art no student lacked opportunity to perfect himself, any more than in the scientific branches of the profession. Careful drawing and modelling were insisted on, as well as attendance upon lectures on perspective, and there were liberal rewards inducing to earnest study. Like aids in mastering the theory and practice of their art were to be found in the architectural classes at University and King's Colleges. No doubt museums of models and casts, for which there was still much outcry, would prove a great boon to many, but casts were no proper substitutes for originals where these themselves could be studied. But after all that schools could do to fit a man for the present examination, or for some higher one, there was still to be acquired the practical education best learned in an architect's office, whether large or small,—for each had much to be said for it,—and in everyday business red-tape was, perhaps, a bad master, but it might often be found a good servant. In every calling there was much detail work which was best learned when very young, and familiarity with which saved much time in after-life, often enabling men to form quick decisions, seemingly prompted by instinct or intuition. The President illustrated the importance of the practical side in an architect's education by pointing out the prominence of the element in the examination for the military profession. He referred also to actual or possible relations of the Institute with schools of practical engineering and with the City and Guilds of London Institute, whose Technical College would doubtless welcome such an alliance. That College would afford young architects insight into artificers' work, whilst its students might be aided by the body to which his audience belonged in the study of the more scientific and æsthetic branches.

It was one of the duties of the Institute to guard against infringements of the code of honour which governed the relations between architects and their employers. Architects could not be too careful with regard to the pecuniary affairs of themselves and of those whom they employed on behalf of their clients. It was a tradition which had been handed down to them, and should continue to be handed down from generation to generation, that the architect should think of his duty to his client before contending for his own remuneration, and no illicit gains, however small or however large, should for a moment enter into his imagination, still less into his pockets.

National and international exhibitions were the next topic touched upon, *à propos* of those forthcoming at Amsterdam and Berlin, both of which, it was understood, would devote much of their space and efforts to Art. At the outset, the President threw out a suggestion by the way, that the Sanitary Institute of Great Britain might well make itself the Sanitary Institute of Europe, and hold forthwith, as such, an International Congress of its own. There were many sanitary matters of cosmopolitan interest, and especially applicable to all large European towns. The safeguarding of public buildings, especially theatres, against fire was another question of common interest to all the great capitalists, and the panic caused by the terrible catastrophe at Vienna drew attention to the want of interna-

* Passed candidates in the Obligatory Examination, March, 1882.

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tional conferences on such problems. Friendly converse between experts from the different countries might lead to the general adoption of all really necessary precautions, and at the same time tend to moderate the excesses of Government interference, such as those into which the Austrian authorities had been frightened in this melancholy instance. The President here glanced at Mr. Aitchison's advocacy, at a provincial congress, of the artistic employment of colour in the interiors of houses, and took occasion to notice the sudden turn taken by the public taste in favour of polychromy.

The year had not been rich in architectural and æsthetical literature. Such productions as the Edmund Sharpe Memorial were not common, and its usefulness to the architect, as well as to the general art student, would make this unique work highly prized. It was a work highly honourable to those who produced it as well as to him to whose memory it was dedicated. The "Lectures" of a former vice-president of the Institute, the late E. Middleton Barry, R.A., edited by his brother, Canon Barry, came next, and a projected reproduction of Art Costumes. The completion of a translation of Viollet-le-Duc's "Lectures on Architecture" had appeared, and there had been published several treatises on warming, ventilation, plumbing, sanitation, practical geometry, and iron construction as applied to roofs. The Americans had sent us their views on cottage, farm, and villa architecture, as well as on the interiors of dwellings. From France had been received the concluding *livraison* of "The Vatican," a work on the construction of the Hôtel de Ville, another on the Château of Versailles, several on the Renaissance, and another part or two of the works of Viollet-le-Duc. Germany had sent photographic views of executed buildings in her chief cities, and works on the various architectural styles and their history.

Passing to the subject of restorations, the President said those at Bristol, under their friend and Fellow, Mr. J. L. Pearson, R.A., would, doubtless, add to his laurels, but some regret had been expressed that his plans involved the destruction of the abbot's lodgings. St. Alban's was still a focus of discussion and criticism, and was likely to be so for some time to come. The Tower of London was now, he believed, about to receive the attention of the restorer.

In the archæological investigations of Classical architecture, what now mainly interested men of culture was the contemplated resumption of Mr. J. T. Wood's excavations at Ephesus. They could only hope that an undertaking on which that gentleman had lavished so many years of patient and thoughtful toil, and from which nothing but the exhaustion of his resources could have induced him to desist, might be started afresh, and brought to a successful issue. The Temple of Diana at Ephesus was unique among Greek fanes. It was not a copy of the Parthenon at Athens, but had an individuality of its own, making a type by itself. As to the importance of its rescue from the dust of ages, Professor Newton's words were quoted:—"The complete excavation of the Temple of Diana at Ephesus is an object well worthy of support from the nation, which now possesses in the British Museum the only portions of the beautiful sculptures as yet dis-discovered of the Temple." The President earnestly appealed to those present to do their best in enlisting the sympathies of all able to help forward a renewal of the enterprise. The cessation of his labours just at the time when he was expecting to find the most important remains of the Temple, including the sculptured frieze and cornice, was a bitter disappointment to the man who had made for a noble end so many personal sacrifices, amongst them being his professional prospects as an architect. Roman remains of some interest to architects seemed to have been recently found at Bath, and the more important discovery of a Gallo-Roman city near Poictiers was reported from France.

Metropolitan improvements, decided on or proposed, were next passed in review. With regard to the necessity of improved approaches to the new Royal Courts of Justice, reference was made to a plan suggested by Mr. C. F. Hayward, F.S.A., for a new thoroughfare proposed to be driven northwards from the Strand through the slums of Clare-market to Holborn. With reference to the proposed new Government Offices, the President expressed the hope that no morbid desire for economy would be allowed to prevail, to the detriment not only of architectural effect, but of public utility. He strongly deprecated the construction of other bridges below London Bridge, as tending to shift the world's commerce,—which had made London what it is,—to Blackwall, Gravesend, possibly to Southampton.

The new system of graded architectural competitions had been tried at Glasgow and Birkenhead, so far with success. At Glasgow there were some 140 primary candidates, from whom ten were selected for the final struggle. At Birkenhead 130 sent in preliminary sketches, of whom five were selected for the final competition. In both cases the commission had been confided to the winner in the last trial of strength. Perhaps the most important competition abroad in the course of last year was that for the Berlin Senate House. The Institute should endeavour this session to bring to a practical conclusion its discussion on this head. From a list of British Architects who had achieved successes during the past year were named Brock, Brandon, Blomfield, T. C. Clarke, Ferrey, Lainson, Low, Peebles, Phipps, Plumbe, Robins, Robson, Shaw, Verity, and Vulliamy.

Turning to the prospects of the opening session, reference was made to some of the papers which it was expected would be read at the general meetings. These would include one on Cyprus by one of the Vice-Presidents; one on the decoration of St. Paul's; one by the holder of the Godwin Bursary, who would describe some of the things being done in American building and sanitary work; and one by Mr. William Simpson, on architecture among the Himalaya Mountains. The newly-instituted Examination might be trusted for the recruiting of their ranks, which would also continue to be swollen by ever fresh accessions of painters, sculptors, and other fellow-artists, through the Honorary Associateship, dating from 1877. And whilst knitting their bonds of amity with votaries of other arts, there was room, the President thought, for improvement in their relations with the Royal Academy, so far as concerned the Institute's friendly rivalry with the architectural section of that body. Did he trespass unfairly on dangerous ground by hinting that were that section placed under a more catholic *régime* the Academy would be more popular with architects, without any loss to the public? One other all but vitally important matter that would have to be dealt with was the relative position of the metropolitan and provincial members of the Institute. Some of the latter complained that, whilst the burden of support fell on all alike, the benefits were not so equally shared, and accordingly demanded a conference. The President felt sure the Council would heartily welcome their country brethren to such a meeting, hear them with attention, and redress any proved grievances.

Mr. Charles Hutton Gregory, Vice-President of the Institution of Civil Engineers, said it afforded him very great pleasure to move a vote of thanks to Mr. Horace Jones for his very interesting, instructive, and genial address. The singular honour having been done him (the speaker) of asking him to move the vote of thanks, he could not help looking back to the time, now nearly fifty years ago, when, by the kindness of his dear old friend, Professor Donaldson, he was allowed, as a young engineering student, to attend the meetings of the Institute of Architects, then in very different circumstances to those in which he now found it. It was then, although warmly supported by many good men, a struggling body, and had not attained to that high position as the representative body of the profession which it now occupied. The address which they had just listened to was characterised by that practical good sense, generosity, sincerity, and geniality so typical of the distinguished architect whose production it was. Referring to the great municipal works erected in the City of London by the President, the speaker said that the great markets built from his designs and under his supervision were laid out with great skill both above and below ground. Among the President's other works were the restoration of the Guildhall, the erection of the new Library and Reading-room, and the new Council Chamber, now in progress. There was one work by the President which he could have wished had been perpetuated in stone in some appropriate position, viz., the beautiful temporary archway erected at the foot of Ludgate-hill (screening the railway bridge) on the occasion of Her Majesty's visit to St. Paul's to return thanks for the restoration to health of H.R.H. the Prince of Wales. He was pleased to know, however, that although the erection did not live in stone in the City of London, a drawing of it occupied a prominent position on the walls of the Queen's private apartments at Windsor.

Professor T. Roger Smith said he felt it to be a great privilege to be allowed to second a vote of thanks so ably proposed by a distinguished member of the sister profession of engineering. He was quite sure that the members could not have listened to the way in which the President had reviewed the work of the past year, and sketched out the programme for the future, without feeling that they had in him an excellent example of the value of a professional president. The address to which they had had the pleasure of listening was eminently professional, and also eminently presidential. Besides noticing the larger matters appertaining to the work and education of the architect, allusion was also made to many smaller matters, all interesting and important, and deserving of recognition. The touching references made in it to those who were dead, and the kindly allusions to those who were living, had been very appropriate. It was a matter on which the President might fittingly be congratulated that he was called upon to preside over the Institute at the time when the compulsory Examination which he had laboured hard for many years to bring about, was duly established. The institution of the Obligatory Examination was the most important step, having regard to the future of the profession, that the Institute had taken for many years, but he thought that it was unquestionable that the establishment of a compulsory examination would not have been possible at this time but for the fact that the way had been prepared for it by the Voluntary Examinations established some twenty years ago. He hoped to see the time when they should feel justified in setting up a higher standard by making the Examination more stringent and wider in range than it was at present. In conclusion, Professor Roger Smith offered his personal congratulations to his old friend Mr. Horace Jones on having attained to a position to which the excellence of his personal merits, and the excellence of his works as an architect, so fully entitled him.

The motion was carried by acclamation, and the President having said a few words in acknowledgment, the meeting terminated.

THE INSTITUTE VOLUME OF TRANSACTIONS.

THE volume of the Transactions of the Institute of Architects for the session 1881-2 is a remarkably practical one; perhaps we may say that it is rather too much taken up with practical matters to the exclusion of the artistic side of architecture. The next year's subjects may, however, be arranged so as to balance this tendency. There were special reasons at the present time for some part of the practicality of the Proceedings. The coming use of the electric light is so important a subject in connexion with the arrangements for lighting dwelling-houses, that it would have been a decided omission if it had not received special attention. The biographical element also occupies a considerable space, and two long memorial notices of one architect, however eminent, in the same volume, seem a little disproportionate.

The only purely artistic paper in the volume is that by Mr. Hugh Stannus, "On the Artistic Treatment of Constructional Ironwork," a subject of equal interest and difficulty. Mr. Stannus's paper is a very thoughtful one, and includes a good many good suggestions; not all new, certainly, but which may just as well be repeated until more attention is paid to them. It may be questioned whether the author or the Institute were well advised in publishing some of the illustrations which accompany the paper. It is one thing to lay down the principles on which a material should be treated, another thing to give illustrations showing what is good and what is bad; he who succeeds in the one may not succeed in the other. We certainly could not accept fig. 3 in No. 8 of the illustration pages as an example of good treatment of a

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small cast-iron girder; on the contrary, we should feel compelled to repudiate it as entirely bad and mistaken both in regard to the purpose and material. The wrought-iron girder above it is much better. The fact is that if we must use cast-iron and strive to use it ornamentally, the simpler the ornament the better, and certainly it should never attempt to imitate surface modelling such as might be carved. If we understand Mr. Stannus aright, he implies as much in his paper, but his illustrations do not in all cases carry it out. The two contrasted examples of brackets for roof springers (fig. 1, sheet 9) illustrate well the principle on which an iron bracket should be treated in the case supposed. The page of iron cantilevers (No. 10), again, is very much open to criticism, simply as design, independently of the material. The most agreeable of all the iron cantilevers is the perfectly plain one (fig. 1), introduced merely to show how the material is best applied, so that it shall be all doing its work, and not wasted; and this illustrates, in fact, what we believe will be found to be the best rule in treating the design of constructional ironwork, —to be content with making it express its constructive function as clearly and simply as possible. Most of what is added beyond this is in danger of weakening the constructive expression, and of appearing uncalled for, and introducing an effect at variance with the real character of iron. Indeed, we are inclined to suggest that the best way of treating constructional ironwork is to make it in the strongest form for its purpose, and to trust to colour for relieving it (colour of some kind being a necessity, at any rate), or colour combined with perforation of the parts on which the stress does not fall. Iron cannot well be surface-modelled, in the forms in which it is used in construction, and it MUST be painted, for practical reasons: let the colouring provide the ornament, or the principal part of it, only giving a little characteristic shaping, where possible, to the leading lines or prominent points of the ironwork.

The long paper by Mr. Boult, on "Uniformity in Building and Sanitary Regulations," and the elaborate discussion thereupon which followed, embody together a good deal of suggestion as to what is required in building and sanitary legislation, though the conclusions to be derived from the paper and discussion combined might certainly have been led up to with a much smaller expenditure of space and type; and a *resumé* of the discussion, merely showing the views which each speaker held, would have been sufficient for the purpose of reference. The reporting of the discussions appears to us in this and other cases to be carried to far too great length and to be a very questionable expenditure of money on printing. Some of the discussions read like newspaper reports republished in a permanent form. It is certainly very superfluous to stereotype in this way all the complimentary sentences with which speakers constantly commence their remarks, of which complimentary element there is, in fact, a good deal too much in the Institute discussions. If the council authorised a sub-committee to read the notes of the speeches and condense them into a brief expression of the kernel of their meaning, a good deal of unnecessary type and paper would be saved. It would be an invidious duty to impose on the secretary as a single individual, but a small editing sub-committee in conjunction with the secretary could do the work of condensation, and save money which might be spent more usefully in procuring some out of the long list of books which it is stated are wanted for the library, or in furnishing a greater number of illustrations to the Transactions, which would be likely to give to the volumes much more value, both to members and to outsiders, than they could derive from the detailed records of speeches not always concentrated or to the point. In other respects the editing of the volume, and the character of type and paper, are all that could be wished.

THE PALACE OF THE TUILERIES.

ACCORDING to the Paris correspondent of the *Vossische Zeitung*, the commission respecting historical monuments lately decided upon selling the ruins of the Tuileries as they now stand. Thus, after three centuries, it will be the ultimate fate of the palatial structure of Philibert Delorme (the celebrated architect of Catherine of Medici's period) to come under the auctioneer's hammer.

REMARKS ON THE SETTLED LAND ACT.

THE passing of the Settled Land Act is matter for congratulation, for it is the most considerable step towards what has been termed "freedom of land," that the Legislature has yet taken. Primarily it may be said to interest large proprietors of land in agricultural districts; but, on the other hand, it is impossible to suppose that its effect will not be largely felt in towns. It is not improbable that it may diminish to a considerable extent the present custom of granting long leases, for though these are authorised by the Act, it is highly probable that the power of sale which is given by it will take their place. When we are upon this point of leases it may be as well to call attention to the fact that it was only allowable for trustees of settled estates to grant building leases for long terms under the provisions of the Settled Estates Act, 1877, by permission of the Court of Chancery. Now, however, by the Act which comes into operation on the 1st of January, the tenant for life may, without consulting either the Court or the trustees of the settlement, "lease the settled land, or any part thereof, or any easement, right, or privilege of any kind, over or in relation to the same, for any purpose whatever, whether involving waste or not, for any term not exceeding (1) in case of a building lease ninety-nine years." Practically, therefore, the tenant for life has as much power over the land as if he were an owner in fee, and there can be no question that many owners of land will exercise their new rights. In many cases, too, even where building leases of land were before attainable, much trouble had often to be undergone before a lease could be obtained when trustees and courts of law had to be moved in the matter; though this will now be ended, yet, as we have said, we think that sales, rather than long leases, will become more common. By the third section of the Act, "a tenant for life may sell the settled land, or any part thereof, or any easement, right, or privilege of any kind over or in relation to the same," that is to say, the tenant for life has all the powers of an owner in fee, though when he has obtained the money it can only be expended in certain specified ways, such as buying fresh land, improving that which remains, and investing it in a few high-class and low-interest-bearing stocks. But we are not now concerned so much with this point of the application of the money as with the fact that land can now be sold whether it is, as the phrase goes, "tied up," or whether it is wholly in the power of its owner. We can hardly doubt that the effect of the statute will be to put into circulation, not only properties in agricultural, but also in urban, districts. This should give an impetus to building enterprise, even though under the present system there is a good deal of commercial energy expended in this manner. But as soon as land circulates in urban districts and can be bought and sold with greater ease, we should have lively hopes that more substantial and lasting houses will be erected. The system of leasing land for building purposes practically sets a premium upon houses of a comparatively unsubstantial character, and therefore anything which tends to subdivide land (we are now speaking of towns) tends also, in our opinion, to the erection of substantial and well-built houses. For it is almost certain that more land will come into circulation. There are undoubtedly many tenants for life who, from various reasons, would be glad to sell their property, but cannot as yet do so. Under the provisions of the new Act they will no longer be so hampered, and that, too, whether the settlement be drawn before or after the date at which this statute comes into operation; for it applies to settlements made both before and after the passing of the Act, and not only to settlements entered into after the end of this year. Nothing will be more interesting than to watch the working, not only practical but social, of the Act, and, from our point of view, its effect especially upon buildings and building operations.

There is also another point in this Act which cannot very well be passed over in commenting on its provisions. That is, that the mansion-house of an estate cannot be sold or leased without the concurrence of the trustees. It seems to us that once give the tenant for life absolute power over the estate, it is absurd to put a limitation on his power over the mansion-house. For example, the mansion-house might be in a bad situation, either from a sanitary or from an artistic point of view. Its construction might be old-fashioned, its drainage bad, its rooms and passages inconvenient, and the cost of altering it might be out of all proportion to its value. What would be more reasonable than to sell it and a few acres of surrounding land and build a more convenient residence in some better situation? But in order to do this, the tenant for life must get the permission of the trustees, and if they refuse, then he must take his case before the Chancery Division of the High Court of Justice; whereas, if he wishes to sell all the rest of the estate he can do so at his own will and pleasure, with or without a valid reason. It appears, therefore, to be highly desirable that an alteration in the provisions of the Act in this respect should take place at an early period of next session. We feel convinced that the retention of this limitation will only harass owners and prevent the erection of new and better houses. We should be the last to desire to see old houses, if worthy of preservation on account of their beauty or historical associations, pulled down; but we do not fear that absolute power over property would produce this result, and we see many ways in which it would be beneficial.

Again, it is worthy of notice that among the ways in which purchase-money may be spent are, section 25, the erection of (10) "cottages for labourers, farm servants, and artisans, employed on the settled land or not; (11) farm-houses, offices and out-buildings, and other buildings for farm purposes; (12) saw-mills, scutch-mills, and other mills, water-wheels, engine-houses, and kilns; (13) reservoirs, tanks, conduits, water-courses, pipes, wells, ponds, shafts, dams, weirs, sluices, and other works and machinery for supply and distribution of water, for agricultural, manufacturing, or other purposes, or for domestic or other consumption; (14) tramways, railways, canals, docks; (16) markets and market-places; (17) streets, roads, paths, squares, gardens, or other open spaces for the use, gratuitously or on payment, of the public or of individuals, or for dedication to the public, the same being necessary or proper in connexion with the conversion of land into building land; (18) sewers, drains, &c." All these passages, however, must, we conceive, be read in connexion with the first part of the section, which states that the works are to be "for the benefit of settled land." Now, as this money must be laid out by the trustees, or else by the court, we fear the Act will not have so wide or so beneficial an effect as if the tenant for life himself had the power to dispose of the money raised by the sale of property, which sale, be it observed, he, and he alone, is the sole person to effect. Surely if the Legislature gives a man power to sell the property, it should allow him to deal with its proceeds, especially as the way in which they are to be disposed of is so carefully specified. But even as it is, we look forward to this Act giving rise to considerable structural activity on many properties which, but for its passing, would not have seen such operations. The Act, therefore, may, from various points of view, be considered as one of great importance, and should its operation be as beneficial, as we may reasonably hope it will, the present Parliament will have passed at least one statute of practical and lasting utility.

VERONA.

THE Municipal Council of Verona, a city which has suffered most terribly from the inundations of the present autumn, has offered three prizes, one of 6,000 lire and two of 2,000 lire, for the best project for protecting the city against floods in future. Intending competitors are invited to apply to the Municipality of Verona for further particulars.

The Exchange at Berlin.—The enlargement of the old Exchange, according to the plans of the late architect, Herr Hitzig, has given the city of Berlin an exchange-room, which (according to the *Cologne Gazette*) is more than twice the size of any hall in other cities devoted to similar purposes, the superficial area being upwards of 28,000 square feet. It is intended to accommodate 3,000 persons, and will be lighted by 6,000 gas jets.

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APHRODITE.

Now that the globe is so frequently circumnavigated, and no seas are unknown except those where frost binds the waves, and forbids the mariner to pass, the Mediterranean appears but as one of its smaller watery expanses; but time was when in ancient story the sovereignty of Neptune was bounded by the Pillars of Hercules.

In early classic fable this blue salt lake was the sole ocean of the Greek. Others were presented to him only through dim report, and even the Euxine was shrouded in mystery. The Mediterranean, the mid-earth sea, was the only recognised kingdom of his god Poseidon, and it was in its azure waves that the nymphs, sirens, and tritons of the Greek were born to his teeming imagination, and sported and sang and blew their shells. This was the sea of Hesiod and of Homer, and it was from its waves that Aphrodite rose.

In Italy she was afterwards entitled Venus, may be from the universal adoration paid her; but in Greece her chief name was Aphrodite, from Aphros, the sea foam from which she arose. She was thus pictured by Apelles, emerging from the ocean and wringing her tresses in the sunshine on her ivory shoulder. Several parts of the Mediterranean disputed the honour of her birth, but mostly the poets concur in fixing it near the new British acquisition, the island of Cyprus. It was thither, they narrate, that she was borne by her attendant Tritons, and on its shores that she first landed, whence her title of Cyprian. It was also near the town of Paphos in that island where the admiring inhabitants first welcomed her with divine honours, and erected a temple to her as a divinity, whence her epithet of Paphian; and, in return, it is said that she bestowed on the women of that lovely island, which was her first home, especial gifts of beauty and fascination.

This classic legend, full as it is of poetry and grace, may be acknowledged to be equalled in charm by its Eastern version, as set forth in the Oriental mythology, according to which the Hindoo Venus rose from the profoundest depths of the Indian Ocean, enclosed in the bud of a sacred lotus, which, expanding when it reached the surface of the sea, set free its lovely burden to bewitch the world. Afterwards she became the consort of Vishnu, and is entitled Lakshmi, the universal mother. It is, however, round the shores of the Mediterranean that our most cherished ancient legends will ever linger, and among them those which tell us of the birth of the Goddess of Beauty.

Our classical dictionaries record a good many Aphrodites. Plato mentions two; Cicero speaks of four; and, even when she is described as one, a number of names are assigned to her. Of these she received a great variety in sound and signification, as Cytherea, Dione, Libertina, Apaturea, Telessigama, Myrtea (because the myrtle was dedicated to her), Philomeis (as the Goddess of Mirth), Basilea (as the Queen of Love), Thalassia (as born of the sea), and Anadyomene (as in the act of rising from it, as portrayed by Apelles in his celebrated picture). Many other titles also did this most worshipped of all the female classic divinities receive, not unfrequently from the names of the localities where she was especially adored, and these were very many. Thus scarcely was there an island in the waters of the Ægean, or a city on its shores, but possessed temples erected to her honour, and cherished pictures and statues portraying her imagined graces. The genius of Zeuxis, Apelles, and the pictorial talent generally of the time and Greek race were enlisted in her service, and thus she came to be presented to an admiring world in a great variety of actions and characters. Alas! that all these marvels of the painter's art have perished, and that they should live but in the records of the past, which bear, however, full testimony to their surpassing excellence, and the admiration with which they were regarded in their day.

It is not quite so sad a story in respect to her representations in the sister art, but yet one sufficiently grievous, inasmuch as those statues of her which appear to have been most celebrated seem to have met a similar fate; and, notably, the most celebrated of them all, namely, the Venus of Cnidos, by Praxiteles, for the sole purpose of beholding which, ancient authors inform us that many a voyage was made to that city, up to the time when the statue was removed by the Romans, who were such wholesale despoilers of other cities, of works of art wherewith to enrich their own capital. In the course of time she was again removed to Constantinople, where she eventually perished in the conflagration of the Lausian Palace.

Several statues are extant for which it has been claimed that they more or less resemble her, but none of these can be faithful, as none are endued with the style of form and pose peculiar to Praxiteles, nor with the attractive graces attributed by Lucian, Pliny, and other ancient writers to the Aphrodite of Cnidos, which is asserted to have been not only the most beautiful figure by that sculptor, but also the most beautiful statue in the world.

So far as this, however, we may gather from what is extant on record, that the attitude adopted for her by the sculptor was as standing before the shepherd Paris, on Mount Ida, on the occasion of his celebrated judgment when she bore away from the other goddesses the prize for beauty. Also that she had appropriately such a winning expression that Lucian says that every beholder flattered himself that she smiled upon himself. She was so placed in the small temple in which she stood that she could be seen all round, and every view appears to have been beautiful. The marble in which she was wrought was Parian, of peculiar brilliancy, which may be inferred by the term Lucian applies to it of *Lamprotes*. She rested chiefly on the left foot, the right leg being slightly bent, and her head inclined to look over her right shoulder. In her right hand she held a pendent drapery, which fell in folds over a vase at her feet, and her left hand was in the position of that of the Medicean Venus at Florence. There has been some uncertainty as to which hand held the drapery, and which was before the figure, from the circumstance that, in an ancient coin of Cnidos, of which there is an example in the British Museum, occurs a representation of this Venus, in which its position is reversed. This was a variation, however, not uncommon in olden times, arising from the working of the die out of which the coin was struck, the same way as the object copied, which, of course, was reversed in the impression.

Art may well lament a loss such as this, of the most admired by the ancient world of all the statues of the Celestial Queen of Beauty which the Greek chisel produced. As regret, however, will not recombine her ashes, we must find relief in trying to imagine her charms superior to those of all other versions, and thus reconstruct her ideal by refining on the beauties of those which remain to us.

It is not, however, always easy to distinguish the true representations of Venus from those which were only modified portraits, or which represent other divinities of the heathen mythology. A statue of any beautiful woman is very apt to receive the name of a Venus, although such may not have been the intention of the artist; and as an example of the uncertainty of subject which attaches to some ancient works of this class may be cited the grand statue in the Louvre which goes by the name of the Venus of Melos. Noble and excellent as she is, there is nothing special in her attitude or character to assure us that she represents an Aphrodite, or that she may not rather embody the Genius of Victory or the Nereid of the island where she was found. Truth to say, the features of the face, when they are examined critically, are not very elevated in character, and are much surpassed in refinement and beauty by those of some other ancient female statues and busts. The arms of this magnificent figure, which bears much resemblance in style to the Phidian type, are lost, and authorities are undecided as to what they were occupied with; but we are unwilling to suppose, as has been suggested, that they originally held a mirror in which she was regarding herself. A worthier sentiment would be more welcome, as more in accordance with her noble form, which is that of a heroine rather than of a coquette.

The Venus of Naples, entitled *Callipygos*, discovered in the ruins of the golden house of Nero, is an instance of incertitude in another direction. She possesses none of the poetic air of the Goddess of the Sea, but rather has the semblance of the full-length portrait of a pretty model, and the story associated with her favours this idea. It thus runs: a model visiting a sculptor's studio to exhibit herself for employment in her vocation, and the artist not appearing to appreciate her beauties to her satisfaction, she prepares to depart in some indignation. Her dress, however, in this action not being fully arranged, she turns round hastily to complete its disposition, looking over her shoulder, which she does with such grace that the sculptor eagerly exclaimed, "Stay, I beseech you, I must sculpture you as you are!" And the marble statue was the result. This incident, with the scene of the classic sculptor's studio, might afford a good subject for a picture.

In the Museo Nazionale at Naples, which contains the above statue, is also the beautiful *torso* and head of another Venus which possesses far more the aspect of a goddess. It is usually called Psyche, from the fragment at the back, of what has been suggested to have been a wing, but which is probably drapery. The scale and style of this work are too large for it to be a Psyche, who is usually represented as somewhat *petite* in both respects. It is more probably a Venus, and is of a very grand type; also instead of its having been upright in position, as the *torso* is usually posed, the statue of which it was a part was more probably in degree recumbent and supine, as in part indicated by the forms of the bosom, which are somewhat spread out and flattened, as is the effect of this position in Nature. It is one of the noblest and most "blue blood" examples of the Classic Aphrodite which exist.

The gem of Florence, the Venus de Medicis, always demands attention. Assuredly she has the air of being fully conscious of her claim to admiration, and appears to have posed herself for the purpose; every limb is adjusted so as to be graceful. She affects to be desirous to hide her charms, at the same that she is solicitous not to conceal them too much. The marked expression of this beautiful figure is the invitation to admire; and for some centuries the world has responded to her summons. Indeed, no tour of Italy could be complete without a visit to her shrine.

On the practice of the art of female sculpture in modern times she has had great influence. Partly because her composition is so decorative and her play of line so agreeable, she has had perhaps, almost too much sway in the dictation of female statuesque form; especially in regard to the hands and arms, which are not the originals, but derive their authority from having been adopted as restorations. Her head is not too small, although this is a frequent remark, as that is simply the result of the whole figure being on a somewhat reduced scale so as to enhance delicacy, but, on the other hand, the feet are really larger than is requisite for strength, as they are actually of greater substance than those of some living women of greater stature and perfect activity. The record on her plinth that she was the work of Cleomenes, has been the subject of doubtful comment, for which there appears little reason. But it does not follow that she was made by the Cleomenes who was the sculptor of the Muses. On the contrary, he was probably an Athenian who dwelt in Rome. Her face is rather Roman than Greek, and she does not possess the simplicity of the Greek art of the shores of the Ægean, while yet she has the beauty of execution which belongs to its craft of hand.

Among the well-known antique statues of this class are two familiar and very pleasing ones in crouching attitudes, entitled Venuses, but which might be more appropriately called Nymphs, as the nature of their actions, although graceful, deprives them of dignity.

There are so many statues which have received the title of Venus that anything approaching to a complete list might be tedious to any one but a devout statistician, and allusion will only be made to a few more. Of the alternative draped statue of Venus, which was presented to the people of Cos to choose from at the same time with the nude one of Cnidos, there are several aspirants to the honour of being copies, but none of them, unfortunately for their pretensions, bear the stamp of Praxiteles, either in style of form or free arrangement of draperies, and the reverse of a coin of Faustina which has been regarded as representing its attitude possesses but little authority in this respect. In fact, we know even less about her than of her rival sister. Both appeared enwrapped in a cloud of mystery, and the only fact which seems distinct is that the committee of art at Cos made a wrong choice, an error not without parallel in our days.

Among the Venuses of note are to be reckoned

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the Venus of Capua, the Venus of Arles, and the Venus Genetrix, and several marine Venuses, so-called from the objects associated with them; also several with Cupids, and others with vases and draperies. Most of these are called Greek, and probably were produced by Greek hands in Italy. The ancient Roman despised the chisel and the brush, and thought only the sword and lance worthy of his warlike hands. The metal style even, with which he wrote on his waxen tablets, may perhaps have found the more favour with him, as he could, on occasion, use it as a weapon, the stiletto of modern Italy.

Our own British Museum possesses several Venuses, among which two are especially charming. One of these is much less than life-size; the other considerably exceeds it. The smaller Venus is in an upright position, and is so extremely simple and innocent in its expression that it might personify an Eve but for the adjunct of a little drapery at the lower part of the figure, which helps to support it. The larger figure is the Dione, or the Townley Venus, which was found at Ostia, and, of all the statues of Venus which are now extant, none may be said to have greater claims on us for admiration. While different in style, she fully equals the Venus of Melos of the Louvre, and her face is of a much more elevated character. In some respects the two statues coincide, namely, in being somewhat larger than life-size, and having the lower half of the figure draperied, which also is in a separate block of marble. In other respects their character is widely different, the Venus of our Museum possessing more intellectual and refined character, and she of the Louvre more of the development of physical contour. They are, however, a worthy pair, and the two nations to whom they now respectively belong may well prize and cherish them. The bust of the Townley Venus is deficient in one point of detail in a somewhat peculiar manner, which, however, is not perceptible when she rests on an elevated pedestal, which, no doubt, she was originally intended to occupy, as she does in the Museum, as the divinity of a shrine. It may be remarked of her that, of all the antique statues of Venus extant, there is no one that is more perfectly a lady in expression, dignity, and grace.

With all her great wealth, and profusion in dispensing it in magnificent luxury, the period of Imperial Rome did not equal the three most energetic and prolific centuries of Greek art in the production of noble statues and groups. In addition, however, to those which she took from Greece and her isles and the shores of the Ægean Sea, she added many by the hands of Greeks transported to Italy for the purpose. The time was to come, however, when she, in her turn, had to feel the dismay of defeat; when, eventually, wave after wave of revolution and ruin destroyed or concealed, among other riches, the larger portion of her sculptural treasures.

After the lapse, however, of some centuries another era dawned over Italy, and the seeds of beauty which had been originally derived from another land having been scattered so lavishly in her soil, Fine Art again arose from it as if it had been its native home. At the period of the Renaissance she took up her thread anew, and began afresh to weave her magic web. Fostered by the occasional discovery of some of the finest works of ancient time among the ruins of palaces and temples, and even from beneath the soil of the chief Italian cities and their neighbourhoods, Sculpture arose again, took up her chisel, and, favoured by her anciently-worked and ready quarries of beautiful marble, began again enthusiastically to fashion the human form, and seek to rival the grace, dignity, and beauty of the examples of the ancient statues which were being discovered around day by day in excavations prosecuted by newly-aroused enthusiasm.

True sculpture, which was born in Greece, after her sleep of ages, awoke to find a fresh and modern home in Italy, especially in Rome, which she has of late centuries made especially her residence, and where accordingly by far the larger portion of really worthy poetic modern sculpture has been born and bred, and the production of Aphrodites has not been neglected. With but few exceptions each modern sculptor of note who has made Rome his residence, has considered his career incomplete without stamping in marble his own idea of the Goddess of Beauty. And but that these remarks are restricted to the Aphrodites of ancient time, it would be a pleasing task to add a view of those which have been produced in modern days.

No one of these sculptors, however, seems to have applied his talents to reconstruct, from such data as we possess, the acknowledged most beautiful Aphrodite of ancient time, of which we have spoken, the marble statue of the Venus of Cnidos. It appears, nevertheless, to be a most attractive subject, on which a sculptor might lavish all the resources of his experience, research, invention, and taste, and that it would be also infinitely interesting archæologically. We, therefore, venture to suggest the idea as one worthy to be entertained by the greatest masters of the art; at the same time adding that it might not be an unfit subject for a prize to excite the ambition of students. In the case of the former they probably would not be content without their work being of full size; while in that of students, the scale might be judiciously restricted to half-life scale, or even less.

What we know of the style and flowing contours of human form adopted by Praxiteles has received a most valuable accession in the statue of Hermes, lately discovered at Olympia, which, although not female, is, at any rate, divine and youthful. In the lovely and startlingly fresh arrangement of drapery also which is pendent by its side, admirable hints might be gathered for the folds of that drapery which we know hung from the right hand of the Venus of Cnidos over the vase at her feet. That the subject of the restoration of this gem of ancient sculpture seems not hitherto to have been attempted in modern days appears to afford no valid reason why it should not be so; but rather, on the other hand, offers the advantage of a fresh and untrodden field for the enthusiasm, ardour, study, and ability of our modern sculptors.

THE PROPOSED LONGFELLOW MEMORIAL.

The first meeting of the Longfellow Memorial Committee was held last week at the Marlborough Rooms, Regent-street, under the presidency of Lord Braye. The Chairman stated that it had been proposed that the memorial should consist of a bust to be placed in Westminster Abbey, and that the object of the meeting was to select a special committee to whom the carrying out of the project should be entrusted. Canon Rowsell moved the appointment of such committee, "for securing the presentation of a bust of the late Henry Wadsworth Longfellow, to be placed in Poets' Corner, Westminster Abbey," on the ground that the whole English-speaking race owed a deep debt of gratitude to Longfellow, and that the good feeling between England and America would be deepened by the proposed memorial. He observed that there would probably be a larger fund raised than would be required for the bust, and that it was proposed with the balance to found scholarships. Earl Granville, in seconding the resolution, spoke eloquently, though with a little pardonable exaggeration, of the importance of the contributions of the departed poet to the poetical literature of the English language. Sir J. Arbuthnot supported the resolution, and it was agreed to. Mr. Borlase, M.P., moved the appointment of an executive committee, for which he submitted a list of seventy-five names (far too large a number, we may observe, for practical working, if any large proportion of them were to take active part in the business); which resolution, with the support of the Rev. Paxton Hood and Mr. Rossetti, was also carried. Mr. G. Godwin moved, and Sir J. Bennett seconded, a resolution (also carried), that as soon as possible a public meeting should be held at the Lyceum Theatre, which Mr. Irving would lend for the purpose, in support of the object. It was stated that 500*l.* had already been subscribed by about one-third of the members of the committee.

We must protest against the very mistaken course which, as it appears to us, the committee are pursuing in regard to this matter. In the first place, Westminster Abbey is the mausoleum of distinguished Englishmen, not of distinguished Americans, however endeared to us. In the second place, the diversion of part (perhaps it will turn out to be a large part) of the subscribed funds towards founding scholarships is a most unsatisfactory way of founding a memorial to a poet whose chief place and popularity in this country is owing to the fact, not that he was as great a poet as some others of our time, nor that he was a learned student of modern literature, but that he wrote what came home in a remarkable degree to the hearts and sympathies of the people at large. He was a poet for the many, not for the few; and his monument should be a memorial placed in a public situation, and of such a nature as to give opportunity for the production of a work of art on a large scale, such as would appeal, as long as it endured, to the observation of every one, and be a worthy reminder of the man whose thoughts and expressions have passed into household words in so many thousands of English families, and will become to a certain extent proverbial among us. Now, a scholarship is no memorial at all in a public sense. It might be a fitting kind of memorial if we regarded Longfellow mainly as a student of literature; but it is not in that capacity that we honour him; it is as a poet. When a committee met at Oxford the other day to propose a memorial to the late Professor Balfour, it was fittingly urged by Professor Huxley that the endowment of students in the same field of research would be the best memorial to his name; because his was essentially a University and student's reputation. But Longfellow's was not a student's reputation, but the reputation of a popular poet (using the term in no disparaging sense), and his monument should be before the eyes of the people. A scholarship is no monument at all in a popular sense. Most persons forget all about it, and of those who may read an occasional announcement that some one has gained the "Longfellow Scholarship," probably nine out of ten will be under the impression that it was a scholarship founded by Longfellow himself. Moreover, the memorial to a poet who has created beautiful ideas and embodied them in beautiful form should be such as will afford the opportunity for a beautiful creation in art of another class; not a mere portrait bust, even if Westminster Abbey were the right place for that, which, as we have said, it is not.

This opinion cannot be new to those members of the general committee who were present at the meeting referred to, inasmuch as they were strongly urged by one member of the committee who spoke on the occasion, and appeared to have the approval of a considerable number of those present. It is, however, one of the peculiarities of the manner in which these kind of discussions get represented in the daily press, that the young men who are entrusted with the duty of reporting the proceedings can form no judgment as to the point or importance of any suggestion which goes out of the beaten track, or which is not included in the remarks of the one or two titled speakers upon whom they generally bestow all their attention. It would be impossible for any one to conclude from the reports in the daily papers that there was any dissentient opinion expressed at the meeting, or that everybody was not entirely unanimous in adherence to the very questionable proposal on which we have commented. It seems hardly reasonable, however, to expect accuracy in reporting a discussion from newspapers which cannot even give correctly the well-known name of the poet in whose honour the meeting was convened, and describe him as "Henry Wordsworth Longfellow"!

The Growth of American Trees.—Some notes have been published on the native trees of the lower Wabash and White River Valleys, the result of long and careful observations, made by Mr. Robert Ridgway and other naturalists, upon the forest growth of Southern Indiana and Illinois. The region described is of special interest. Nearly all the largest and most valuable broad-leaved trees are there found associated together, and in a single square mile of woods seventy-five species of trees, nearly all of the first class, were tabulated, being nearly as many as grow on the whole European continent. By actual measurement thirty-four species were found to occasionally exceed 100 ft. in height, while seventeen others, although not measured, were apparently at least 100 ft. high. The tallest specimen measured, a tulip-tree, was 190 ft. in height, and individuals of ten other species exceeded 150 ft. Mr. Ridgway states that the numerous small prairies, which were common in the Wabash basin at the time of its first settlement, have been transformed into woodland, and the area of the forest has greatly increased of late years.

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A VISIT TO THE BRIGHTON RAILWAY WORKS.

CAN you imagine London without cabs, policemen, or railways, and that travellers about sixty years ago are said to have made their wills before starting on a journey? The most imaginative of the rising generation can scarcely picture such a state of London life, and yet there are men and women living who can remember it.

In 1819, when Thomas Gray, the first promoter of railways, published a work on this subject, he was considered little better than a madman, but his name, associated with those of Joseph Sanders and William Edward Pease, should always be respected; for these were the men who first promulgated and brought the subject commercially home to the people of their time.

Mail-coaches sixty years back took seventeen hours, and forty-six years ago fourteen hours, to run from Derby to London, the distance being about 130 miles. The *outside* fare was 30s., and the *inside* fare, 52s. The charge for sending letters at that time was 10d. each; that for forwarding silk goods by boat on the canal was 5s. per cwt.; other goods from 3s. 6d. to 5s., according to their value. To send goods of all sorts by Pickford's vans, or by coach, the charge was 14s. per cwt.

I have been favoured with the following copy of fare-bill published then, as follows:—

Name of Coach.	Time taken in running from Derby to London.	Outside fare.	Inside fare.
	Hours.	£. s. d.	£. s. d.
Mail Coach ...	14	1 10 0	2 12 0
Defiance ..... } Telegraph..... } Times ..... }	16	1 6 0	2 10 0

In addition to these charges, passengers had to stop for refreshments three times, and on each occasion there was a change of coachmen and guards, who had all to be feed. The distance may now be travelled by railway in three hours, the fares being,—for third-class, about 10s. 7d., and for first-class, 17s.

When railways were first opened, the passengers were so few that the booking-clerk used to enter their names down and the stations to which they were going, and very often delayed a train several minutes to see if any more customers showed up. They very often had to travel in open trucks like a lot of cattle stowed together, and third-class passengers were looked on more as a nuisance than as a source of profit; travellers were carefully locked in the carriages, and a second latch near the bottom of the door was placed so that they could not reach it, except by hooking it up with a walking-stick or umbrella-handle. It seemed to be generally understood at that time that none but railway men dare to open any carriage-door.

Having often heard these seemingly strange things related, we thought a visit to a modern railway works would, by way of contrast, be both amusing and instructive, and through the kindness of Mr. W. Stroudley, Locomotive Engineer of the Brighton Railway Works, we lately had permission to inspect the various workshops under his charge, which are situated on the eastern side of the railway, and adjoining the Brighton terminus.

At the present time there are 1,400 men and boys employed in the various departments, which consist of carriage and wagon shops, saw-mill, wheel turnery, smithy, general turnery, erecting-shop, boiler-shop, brass foundry, coppersmiths' and tinmen's shops, ironfoundry, painters' and trimmers' shops, &c. We may say, generally, that throughout the whole of the works care has been taken that the *employés* engaged in the company's service shall have plenty of light, air space, and lime-whited walls, the shops being both spacious and lofty, and a cheerfulness seems to pervade the workshops throughout, as the visitor passes from one department to another. On inquiring from Mr. Trangmar, who acted as our guide, we learned that the company have in use 2,880 carriages for passenger traffic, 7,237 wagons, &c., for goods traffic, and 401 locomotives. The miles run by passenger trains the last half-year were upwards of 3,000,000, and by passenger and goods train combined 3,814,882, the number of miles now open for traffic being 413.

The advantage of inspecting a large railway works, like the London, Brighton, and South Coast, is that one can see every part of an engine or carriage in detail, and afterwards put together in complete form. Take a railway coach, for instance: a scantling list is first made out from the general drawing of that particular vehicle, and the various timbers are cut in the saw-mill to the sizes given. The pieces are then taken into the machine-shop and planed, tenoned, mortised, and drilled, and then conveyed to the underframe-shop, or the body-shop, as the case may be, for the workmen to fit together, the ironwork being supplied from the smithy,—bolts and coach-screws from the stores,—which has been made up from a working list supplied from the drawing-office, as described in the case of timber scantlings.

All headstocks and cross-bars in a carriage under-frame are of teak wood. Diagonals and sole or side bars are of pitch pine, the sole bars having a quarter-inch wrought-iron flitch-plate on their outer surface, firmly bolted at intervals throughout its length.

The buffer-rods, side-chains, and corner-knees are of wrought iron, buffing and bearing springs of steel, the former consisting of twenty plates 3 in. wide and 5-16ths in. thick, with exception of back-plate, which is 3-8ths in. thick, and supported in their working position by cradle-timbers, framed into cross-bearers, so that the ends of the springs come into contact with shoes at the ends of the buffer-rods, to take the thrust of the latter when brought into play.

The outside panels, door-stiles, &c., of carriage bodies are of mahogany, the flooring, seat-frames, &c., are of pitch pine, and in all first-class compartments the divisional partitions are veneered over with a layer of very clear and white sycamore wood, which has the effect of lightening the interiors of compartments, thereby giving them a cheerful appearance to the traveller. To assist the springs, and give elasticity to the carriage when running, the ends and sides are bedded on Attock & Spencer's patent recessed india-rubber blocks, fitted between the top of sole bars and bottom of carriage bodies.

Brake blocks are mostly made of black poplar, imported from France; other soft stringy wood is also used, such as willow, &c. The continuous brakes used on this line are all Westinghouse's patent. Carriage-axles are made of double-fagotted iron, supplied by the Monkbridge Ironworks.

The carriage-wheels are made with tyres of Cammell's crucible steel, with treads 2 in. thick, and 3 ft. 6 in. diameter over the treads or the surface running on the rails of the permanent way. The bodies of most passenger-stock wheels are filled in with teak wood blocks, secured to tyres by a method known as "Stroudley's patent." Each pair of carriage-wheels of this make, after being fixed on their axles, are balanced by being placed between two steel bars, perfectly horizontal; the wheels, having their axle for a centre, are turned round, and if one part of such wheels is heavier than the corresponding part on the opposite side of the wheel, the heavier part naturally falls lower, and the defect is thus detected and balanced. Very few of the travelling public are aware that railway wheels are balanced to such a nicety; this is done to secure uniformity in running.

In the wagon-building shop are made wagons for carrying loads of six, eight, or ten tons, as may be required, high and low sided, and also covered goods-wagons. All under-frames are built up of American oak, and the bodies are of pitch pine, all cut out of logs and trees on the premises.

The saw-mill presents a scene of great activity to the visitor; here we viewed frame saws, circular saws, and band saws, all fully occupied in cutting up the various scantlings for the carriage and wagon builders. An oval spoke-turning lathe, made by Robinson & Co., of Rochdale, is a great labour-saving machine compared with the old method of hand-working.

In the smithy all fires used are made with small coke, no coal being used in this department. All heavy forgings are wrought by steam hammers, the largest of which strikes a blow up to twenty tons, or as low as a few pounds, at the will of the hammer-man, who regulates it by a handle worked with one hand.

The weight of a passenger locomotive-engine without tank varies from 34 tons to 38 tons, and a goods tank-engine in working order about 40 tons. The cost of locomotive-engines may be roundly taken at 2,200*l.* each. The pistons are of solid brass, with two cast-iron split rings to make them steam-tight when working inside cylinders. All crank-axles are of cast steel, other axles wrought-iron. The nave, spokes, and rim of an engine-wheel form one piece when welded together, and have a steel tyre forced on by hydraulic pressure equal to 60 tons, after the body of the wheel has been completed. The ordinary diameter of a driving-wheel on this railway is 6 ft. 6 in., but the company have one engine with 6 ft. 9 in., and two others with 7-ft. driving-wheels. Most of the engine axle-boxes are made of Vickers's cast steel.

At the time of our visit some 1-in. steel-plate tank-engine frames were being cut from the solid plates. Six plates were firmly bolted to the table of a planing-machine, the tool cutting the metal in a straight or curved line as required, so that these plates being cut at one time would be exact duplicates of each other.

To explain how true, and to what exactitude, the various parts of engine works are fitted, we were shown steam-chests, cylinder-covers, &c., faced so perfectly that by simply putting a little boiled oil over their surfaces, and bolting the two faced parts together they make a steam-tight joint.

Boiler shells are made of ½-in. Lowmoor iron plates, and all engine-boilers are "lagged" or covered with 1-in. deal boarding; this serves to keep the heat in, and is again covered with $\frac{1}{16}$-in. wrought-iron lagging-plates, which are painted over on completion of the engine; if it were not for the 1-in. lagging-boards the paint on the outside of the engine-boiler would be burned off the first run the locomotive made. All engines and tenders are cleaned every night, before they are sent out to work again.

The company run specially-constructed Pullman limited express trains, lighted by electricity, twice daily each way, performing the journey in one hour and fifteen minutes; but this time is to be shortened by an engine now being built of their D 3 class express type, which has 6-ft. 6-in. driving and leading wheels, 20-in. cylinders, and is calculated to take twenty coaches from Brighton to London Bridge (52¼ miles) in one hour.

The company do not make all their own engines and carriages. Messrs. Neilson & Co., of Glasgow, lately completed an order for thirty-four locomotives for this railway. All engines have painted on their weather-boards the name of driver and distance run since first built, thus giving a record of the mileage made by each locomotive, and this is added to each time the engine enters the shops for repairs. An engine and tank in the painters' shop, just finished, looked quite in holiday costume, Scotch green being the predominant colour, panelled with black and scarlet lines.

In the copper and tin smiths' shop are made the sheet-iron lamp protectors, for fixing outside the roofs of carriages, tin paint-pots, and cans. Here is beaten out of sheet charcoal iron, steam domes for boilers, and in this shop is executed the tinning over, by dipping in molten tin, of wheels, &c., for Stroudley & Rusbridge's patent electric communication between passenger and driver.

In the foundry, which is both large and lofty, they can cast up to 10 tons weight. Some of the works we saw, such as a double-cylinder casting, were as perfect works as anything of the kind could be, and moulders and pattern-makers evidently do not get as much credit for their skilled labour as they deserve. In order to turn out the castings with as smooth a face as possible, the moulds are coated over with a mixture of ground charcoal and water, which enables the patterns to leave the sand freely. A powerful hand-crane is fixed there, for lifting the heavy ladles with their contents over the various moulds. As much as 10 tons of molten iron is frequently lifted in this manner, and swung about with the greatest ease. The sand of the neighbourhood not being fit for foundry purposes, they have to obtain it from Charlton.

In the brass-foundry is seen the process of mixing and melting the metal for axle-bearings, &c. The different quantities are all weighed before being put into the crucibles: by this

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means a uniformity for various castings can always be kept.

The brass-turnery is kept distinct from the other shops, and all borings, turnings, or drillings are collected, and after cleansing from all extraneous matter, are melted over again for further use. The magnet is especially used for removing any iron filings, &c., as, on being forced into the brass and moved about, all refuse iron adheres to the magnet, and so can easily be separated. In this shop is shown a model of Stroudley's Patent Speed Indicator, which enables the driver to see the speed in miles at which his engine is travelling.

The paint shop, situated on the western side of the line, clear away from the dust and dirt of the other workshops, is a new building about one-eighth of a mile long, with a light iron-trussed roof, and has lines of rails laid down to accommodate upwards of 370 railway coaches, besides space for repairing and painting light parcels-carts. At the end of this shop is the trimming department, where the process of picking horse-hair is seen. The untwisting of the ropes or plaits as delivered by the merchants is done by a machine. In this place all the damask blinds are made, and fitted at bottom with Peters & Co.'s patent leather fringes for windows and doors of carriages, which blinds are mounted on coiled spring-rollers, and are self-acting.

To keep in thorough working order a line of railway as large as the Brighton and South Coast, a good supply of materials must necessarily be kept in stock; and in the yards adjoining the workshops are large numbers of new tires as delivered by the makers, and Vickers's steel cranks, iron-plates, timbers, &c., the value of which is determined at every stock-taking.

Perhaps one of the most pleasant features in the whole work is the reading-room and library attached, for the workmen employed; it is capable of holding between four and five hundred persons. Most of the technical papers, all the London daily newspapers, besides weekly provincials, are taken in. At one end of the reading-room is a stage which enables the members to get up theatrical and other entertainments, and here performances are often given to raise a small fund for widows or orphans of deceased workmen.

The inspection of the works occupied us upwards of four hours, and at the close we were introduced to Mr. Jeffries, who kindly, on behalf of Mr. Stroudley, furnished us with much statistical information. On leaving the locomotive shops we looked over the extensions now in progress, including the new station roof, &c.

The contractors for this work are Messrs. Kirk & Randall, who have lately completed the erection of the Avenue Theatre, and will be remembered as the firm that carried out the extension to Margate pier. The ironwork being used is from the Patent Shaft and Axletree Company, of Wednesbury. The improvements consist in building a roof over the whole of the station, formed by two large spans of 112 ft. each, and a small one on the eastern side of about 46 ft. span. The two large spans will be erected for a distance of about 600 ft. in length, while the eastern and smaller span will only extend 420 ft.; of this, 334 ft. from the entrance and southern end of the station will be covered by a 46 ft. span, and the remaining 86 ft. by a roof 35 ft. wide. There are four rows of columns, two running the entire length of 600 ft., each row numbering twenty-four columns, in most cases being from 27 ft. to 30 ft. apart. The large spans are formed of four channel irons, the two lower ones forming a curve, and the upper two meeting at an obtuse angle of 240 degrees, the whole being strengthened and connected by diagonal struts. The height from the platform level to the apex of the roof is 58 ft. The columns are 26 ft. high. A louvre will be provided at the top of the roof for ventilation, of a span of 20 ft.; the height from the platform level to the top of this louvre is 62 ft. For 32 ft. from the louvre down towards the gutter the roof will be glazed, the remaining portion being covered with board and zinc. The roof on the western side is supported for about half the distance down on columns, the other portion being carried by a wall. The smaller span (46 ft.) is in proportion similarly constructed.

On the eastern side of the station new refreshment-rooms, cloak-room, parcels office, station-master's office, lavatories, &c., are to be built, the whole covering an area of 120 ft. by 40 ft., the old offices and premises being converted into waiting-rooms, &c. A wooden ornamental screen, glazed at the top, is to be placed on the eastern side between the columns, to shield the building from the weather. This will effectually hide a dull and monotonous wall on this side, the view of which has hitherto formed rather an eyesore. At the northern end of the 46 ft. span,—on the eastern side, by the side of the 35 ft. wide roof,—there will be a line of rails, the platform to which will be covered by a verandah.

In addition to these extensive improvements in the interior of the station, the entrance in front is to be entirely covered, this being a space of 246 ft. by about 76 ft. This covering is formed by six bays, the principals of which are constructed with T-irons, and are provided with louvres and glazing at the top. Also a lean-to roof, of 17 ft. span, is to be built on the eastern side, and at the front a glazed lean-to will be formed from the building to the centre of the columns, a distance of 8 ft.

F. J. Bancroft.

STRAIGHTENING A CHIMNEY.

We find an interesting account of straightening a chimney, 330 ft. high, in the *Wochenschrift* of the Society of German Engineers, from which we take the following particulars. The chimney in question, erected in 1880-81 for the blende-roasting furnace of the Liebehoffnung zinc-works at Antonienhütte, Silesia, for carrying off sulphurous gases, soon after its completion began to curve in consequence of strong and continuous gales from the south-east. The work of straightening it was at once confided to two experienced chimney builders, Herren H. Hohmann and F. Ebeling, of Bernburg. It should be premised that the chimney was begun in July, 1880, the base, 53 ft. high and 24 ft. square, being finished before the setting-in of winter, when operations had to be suspended. The work was resumed in the following spring, and actively pushed forward, so that by the end of September, 1881, the chimney was completed, Its principal dimensions are:—

			Height.
Base, 24 ft. square	... ...		ft. 53
Octagonal portion	... ...		,, 10
Round shaft	Diameter at base	Exterior, 19 ft. / Interior, 5 ft. 6 in.	267
	Diameter at top	Exterior, 9 ft. / Interior, 6 ft. 6 in.	
Total height above ground.....			ft. 330

The base is of ordinary Dutch brick laid in lime mortar; the round shaft, 267 ft. high, of stone and lime-mortar, to which was added cement in the upper portion of the chimney, from 40 ft. below the summit. The thickness of the walls of the round shaft, constructed in thirteen steps each about 20 ft. high, is at the lower portion 6 ft. 6 in., at the top 1 ft. 3 in.

The completed chimney was first used in October, 1881. Soon after it began to show a strong curvature towards the north-west, beginning at the foot of the round shaft and running up towards the top in the form approaching a parabola. The curvature was ascribed, as stated, to the continuous south-east gales prevailing at the time, to which the brickwork, which was not yet sufficiently set, had to give. As the foundation of the chimney went down to the solid rock, its curvature could not be attributed to the giving way of the foundation. Subsequent measurements proved, moreover, that the square base had not moved out of the perpendicular, but had remained undisturbed. It was determined by measurements that the summit of the chimney had gradually bent over nearly 10 ft. towards the north-west, so that a plumb-line suspended from the centre of the periphery of the inclined chimney-top was hanging outside the base of the chimney. The two builders named above undertook to remedy this dangerous state of matters, and began work on July 1 of this year. The chimney was first mounted by means of their special scaffolding to a height of 139 ft., where the first cutting was to be made. At this portion, the outer diameter of the chimney is 16 ft., the inner 6 ft. 6 in.; the thickness of the wall was consequently 4 ft. 9 in. The weight of the portion of the chimney-shaft above this first cutting, of a height of 191 ft., is about 670 tons. Calculations and measurements with zinc-gauges had shown that a perpendicular from the calculated centre of gravity of the portion of the chimney above the cutting to a height of 191 ft. upon the section plane intersected the latter about 3·29 in. inside the periphery of the width in the clear of 6 ft. 6 in. diameter, at a distance of about 5 ft. from the outer edge of the brickwork.

For safety's sake, and because the mortar had not sufficiently set, owing to the chimney being taken in use directly after completion, six strong wrought-iron rings, with spring locks, were placed round the chimney above and below the cutting. The latter was begun while the roasting furnace was continued at full work, and had proceeded so far by July 21st that the projection of the centre of gravity upon the section had been undercut to the extent of 3¼ in. On one side, however, a piece of the brickwork had remained, and could not be cut away by the saw, because the latter began already to get too much jammed in the cutting. This piece of brickwork prevented the upper part of the chimney going back, as it hindered the intended turning at the end of the cutting. The consequence was that, the other side of the chimney being undercut, the upper part turned back in a slanting direction towards the south-east by only about 6¼ in., and a crack running perpendicularly upwards began to show itself in the brickwork at the height of the centre of gravity. In this little satisfactory state the chimney was on July 21st; decisive action became necessary, and it was resolved to at once blow out the furnace. The next day the chimney was mounted from the inside as far as the cutting, and the piece of brickwork left as above mentioned so successfully removed that on the same day, in the evening, the undercut part of the chimney turned back the thickness of the cutting. But as this was not sufficient, a second cutting was made at a height of 184 ft., and a third at a height of 223 ft., the whole work of straightening the chimney being completed by August 1st. Although it was found impossible to make the chimney perfectly perpendicular, because the bend began lower than it was possible, with due regard to safety, to make the first cutting, the result of the operations was considered satisfactory. The stability of the chimney had been ensured, and its outward appearance almost restored to the normal.

SCHOOL CONSTRUCTION IN GERMANY.

A medical commission has lately been engaged in framing a series of regulations for the higher schools in Alsace. It is remarked in the report which has just been issued, that if the air in schoolrooms is not to contain more than the proportion of carbonic acid usually allowed (one-tenth per cent.); there must be arrangements made for the conveyance of 2,120 cubic feet of air per hour for each scholar. This can only be done by thorough ventilation, and by the rooms being made as spacious as circumstances will permit.

It is stated that the theory is erroneous which sometimes prevails, that the windows of a schoolroom should only be on one side, and so arranged that the light falls upon the left of the pupils when they are at work. It is remarked that although applicable to the case of high and relatively narrow rooms, it is not usually possible by this method to obtain sufficient light. When, however, this arrangement is employed, the intermediate portions of the wall between the windows should not be more than three-quarters the width of the windows. The bays should be sloped, and the distance from the wall with windows to the opposite wall should not exceed the height of the windows by more than 3 ft., or at most, 5 ft. Thus, according to this principle, it is only relatively small class-rooms which will admit of this system of arranging the windows.

For most school-rooms the admission of light from two opposite sides is, therefore, a matter of necessity. In order to exclude the less useful and more trying light from below, it is suggested that the windows should not come to a less distance than about 3 ft. from the floor. The window-frame, or any portion of the work which throws a shadow, must take up as little room as possible. With a view of utilising the light reflected from the walls and ceiling, a light-blue paint for the walls, and white-washed ceilings, are recommended. Windows at the end of the room where the master's desk is, are condemned, as in that case the pupils have the light facing them. Light from behind can sometimes be judiciously employed, though its use is not recommended. Suitable arrangements require to be made for regulating by

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blinds the admission of light, and it is recommended that care should be taken to have any walls in the immediate proximity of the windows painted a dark colour, as white walls in such a position are very trying to the sight of the pupils.

Artificial light, it is suggested, should be employed without hesitation when the day becomes dark from fog, &c., as working with an insufficient supply of daylight is far more trying to the sight than the use of gas. A sufficient number of gas-jets should be provided, according to the size of the school-room, and preference is given to cylindrical burners as producing a more steady light than is obtainable by means of slit burners. Metal reflectors, lacquered above in a dark colour, and white beneath, are recommended. Globes of ground-glass absorb too much light, and do not sufficiently illuminate the desks, although the room as a whole is better lighted by them. There should be gas-lights above and in front of the master's desk, and the other lights should, it is said, be in two rows over the seats of the scholars at a height of at least 3 feet.

THE ROYAL PALACE AT DRESDEN.

The rebuilding of the magnificent ball-room in this palace is nearly terminated, and it is rumoured that the Emperor of Germany will be present at the inaugural festivities. In the restoration of the ball-room the frescoes by Professor Bendemann are preserved, and the improved arrangement of the windows allows of the beauties of this pictorial decoration being more easily appreciated. Some of the mural ornamentation has been restored by Herr Diethe The late Herr Krüger solved in an efficient manner the difficulty which attended the heightening of the room, by the removal of the servants' apartments which formerly were over it, and in its new form it extends through no less than three stories of the palace; the ventilation of the room gaining materially by the change.

A gallery for the accommodation of an orchestra has been erected; but the local press comments upon the fact that the want of a gallery for spectators is still unprovided for, although such a feature could easily have been comprised in the plans for the restoration. The fundamental colours in the decoration are cream and gold; this delicate combination allowing the magnificent architecture of the room to be displayed with full effect.

THE BRUNSWICK HYGIENIC CONGRESS.

This assembly, which met on the 20th ult., under the presidency of Professor Reklam, of Leipsic, had for its object the prevention of atmospheric impurities, as well as the remedying of such evils as arise from the pollution of rivers and of the ground by sewage and other matter of a noxious character. The opening paper, read by the president, dealt with the general question of sanitary legislation. After reviewing the manner in which the subject is practically treated in various European countries, he gave some valuable and interesting details of the system now in force in Servia, which country he considers a model in this respect. A funded capital of 280,000*l.* exists, the interest of which is devoted to the advancement of sanitary reform. This income, together with the tax especially levied for sanitary purposes, forms a total annual sum of 46,000*l.* available for the purposes contemplated by sanitary legislation.

The discussion on the practical value of the various systems of disposing of sewage matter was remarkable for the objections urged against the water-drainage system, the application of which to the city of Berlin will have cost, when the works in progress are completed, no less a sum than 4,340,000*l.* After making allowance for interest, sinking fund, cost of maintenance, &c., the Berlin drainage costs about 6s. 10d. per annum per head of the population. Professor Müller's paper was not unanimously approved, as far as his attack on the Berlin drainage system was concerned. Herr Clauss argued that the sanitary condition of Berlin had not deteriorated of late years, but had, if anything, improved.

Dr. Gerson, of Hamburg, reported that the adoption of the same system of drainage as that of Berlin, had in his own city been productive of no bad results. He agreed, however, with the opinion expressed at an earlier stage of the discussion by Dr. Blasius, of Brunswick, that local circumstances were in most cases of a nature to regulate the plan of disposal of sewage to be adopted, and considered that the question was hardly as yet ripe for definite treatment. Captain Liernur, of Amsterdam, reported that the municipal authorities of his city had officially expressed their approval of his system, which entails a cost of only 7d. per annum per head of population.

Importance was given to the subject of turf, as a deodorising agent, and as producing, after being used for this purpose, an efficient fertiliser. Herr Knauff, of Berlin, reported the details of a process invented by Dr. Petri for the chemical and mechanical purification of sewage by the agency of turf straw.

Dr. Gerson afterwards called attention to his system of filtration, which he stated costs only one-fifth of the expense of ordinary sand-filtration.

The question of the pollution of rivers by factories was treated with special reference to the local industries of Brunswick.

Before the assemblage finally broke up, a joint inspection was made of the Polytechnic and other public buildings of the city.

IN THE CITY BY THE SEA.

Through all contending "fors and againsts," Brighton, backed by Dr. Richardson's reports, continues victoriously to hold her own as the brightest, gayest, as well as one of the healthiest resorts during the too often gruesome months of October and November. The winds that rage and storm and sweep with violence over moor and mountain,—that strew our streets with the *débris* of insecure houses,—that toss at their pleasure the stateliest ships outward bound,—here but drive the clouds away, leaving the heavens an "unclouded blue," and sending the waves, a mass of foam, dashing and leaping to the shore; while a battle even with an east wind, rich with iodine, stirs our blood like it did the Vikings of old. The rain has been trying lately. Yet once over, the streets dry so rapidly that a rush out is again made by the health-seeking crowd. The two months of October and November are essentially idle months here. People who have drifted apart for months have a friendly chat once more,—so near to London, and yet so far from its turmoil and unrest; and a slight resemblance to Nice gives a *quasi* air of Continentalism to this bright little city by the sea. Theatres, concerts, bazaars, all invite, and all amuse. But the feature of the season has naturally been the welcome given to the 4th Dragoons (Royal Irish) by the town and visitors on Friday in last week, and which many of us remained to see. The day before wind and rain had it all their own way, so that when the morning dawned bright, clear, and sunny,—a day to dream of,—great was the exultation. The town was gay with Venetian masts, banners, floral decorations, and devices. The regiment paraded on horseback through the town in the morning, and marched on foot in their Egyptian costumes to the banquet given at the Dome in the afternoon. The regiment, now under the command of Lieut.-Colonel Shaw Hellier, dates from the reign of James II., by whom it was raised to aid in suppressing the Duke of Monmouth's rebellion, and for nearly two hundred years it has done good service to the State at home and abroad: in France, in Flanders, at the storming of Badajoz, and in the Crimea. Balaclava and Sevastopol are inscribed on its colours, and Cairo and Tel-el-Kebir are now added to its roll of fame. The welcome may have been less noisy than it would have been amongst a rougher set, but it was none the less heartfelt and touching, and we cannot but think, however divergent the opinions as to the war, or the policy of the war, may have been or may be, one glance at the worn and pallid faces of some of the men made one forget for the moment the thought of the rush and the roar of the battle,—colours flying, victory in view,—and think only of the hardships our men have gone through on the sandy wastes of the desert, under the scorching noonday sun,—under the misty starlit heaven, weary often with hunger,—parched with thirst, or, harder still, chained with wounds and racked with pain, to the dull monotony of a hospital bed, where the heroism to "suffer and be strong" becomes more heroic still. The thought that they have borne all this must make for the nonce Conservative and Liberal lay party spirit aside, and join as one in the welcome we give all who have helped to make, we trust, peace more lasting, and who are popular, not from the love of bloodshed and warfare, but because we feel when our Empire is in question the soldier knows but three things,—England, Honour, and Duty.

CARLEON.

ANCIENT GREEK PAINTING.

Professor C. T. Newton, C.B., on the 3rd inst. delivered at University College the first of a course of lectures on ancient Greek painting. The lecturer observed that the main epochs in the history of ancient sculpture had an intimate connexion with the general history of the Greeks, but we could not get a clear idea of the history of ancient sculpture without tracing out, so far as our imperfect knowledge permits, the characteristics and successive stages of ancient painting. Between these twin sister arts there had been in all times, and especially in Greek antiquity, a close sympathy and a reciprocal influence. In the case of painting the extant monuments were few and far between, but we might learn much by the careful study of the mural paintings from the buried Campanian cities, Pompeii, Herculaneum, and those found in the tombs near Rome and Etruria. The paintings on Greek vases would enable us to trace the history of what is called ceramographic art from B.C. 600 for nearly five centuries onwards. After noticing the traditions preserved by Pliny and others as to the earliest painters, the lecturer passed on to the period after the Persian war. Polygnotos of Thasos was the earliest Greek painter of celebrity. He flourished B.C. 480-460. At Athens he decorated with paintings the portico called the Stoa Poikile, the Temple of the Dioscuri, the Temple of Theseus, and the Pinakotheke on the Akropolis. At Delphi he painted on the walls of the building called Lesche two celebrated pictures, the "Taking of Troy" and the "Descent of Ulysses into Hades." All these were mural paintings; the subjects were partly mythical, partly historical. Thus in the Stoa Poikile were represented the taking of Troy, the battle of Theseus with the Amazons, the battle of Marathon. In the Temple of Theseus came the battle of the Lapiths and Centaurs, and the battle of the Amazons again. In the other two Athenian temples he treated mythological subjects. These great public works were executed during the administration of Kimon, to whom Polygnotos stood in the same relation as Phidias did to Perikles, the successor of Kimon. The paintings in the Stoa Poikile were executed by Polygnotos gratuitously, for which service the Athenians rewarded him with the freedom of their city. His greatest and probably his earliest works were the two pictures in the Lesche at Delphi. Of these there was a very full description in Pausanias. The building called Lesche was thought to have been of elliptical form, with a colonnade on either side, separated by a wall in the middle, and to have been about 90 ft. in length. The figures were probably life-size. According to the list given by Pausanias, there were upwards of seventy in each of the two pictures. In that representing the taking of Troy, Polygnotos had brought together many incidents described in the Cyclic epics. Menelaos, Agamemnon, Ulysses, Nestor, Neoptolemos, Antenor, Helen, Andromache, Kassandra, and many other figures, with which the Homeric poems have made us familiar, all appeared united in one skilful composition, arranged in groups. The other picture, the descent of Ulysses into Hades to interrogate Teiresias, might be called a pictorial epic of Hades. On one side was the entrance, indicated by Charon's boat crossing the Acheron, and the evocation of Teiresias by Ulysses, besides the punishment of Tityos and other wicked men. On the other side were Tantalos and Sisyphos. Between these scenes on the flanks were various groups of heroes and heroines from the Trojan and other legends. From the remarks of ancient critics it might be inferred that the genius of Polygnotos, like that of Giotto, was far in advance of his technical skill. Aristotle called him the most ethical of painters, and recommended the young artist to study his works in preference to those of his contemporary Pauson, who was ignobly realistic, or those of Zeuxis, who had great technical merit, but was deficient in spiritual conception.

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The course will comprise four more lectures, as follows:—November 17, "Greek Painters from B.C. 460 to accession of Alexander the Great, B.C. 336,—Apollodoros, Zeuxis, Parrhasios, Pamphilos, Aristides"; November 24, "Greek Painters from Age of Alexander to Augustan Age,—Apelles, Protogenes, Theon"; December 1, "Pictures on Greek Fictile Vases"; December 15, "Mural Paintings from Pompeii, Herculaneum, and other ancient Sites."

ST. PANCRAS WORKHOUSE.

For several years past the question of additional accommodation at the St. Pancras Workhouse, which had been asked for by the Local Government Board, has received the attention of the successive Boards of Guardians of that parish, but as the views of the two authorities differed as to how this should be accomplished, the matter has drifted on without any decision being arrived at, the Local Government Board urging that additional buildings on a new site were necessary, whilst the Guardians, on the other hand, contended that the buildings on the present open site, some five acres in extent, could be remodelled to meet the requirements of the parish for many years to come.

In April of last year a new Board of Guardians was elected, with Mr. Commissioner Kerr as chairman, when it was determined to have the question settled, as a large sum was being lost annually to the parish from the Common Poor Fund, inasmuch as a far greater number of inmates were in the house than had been certified for by the Local Government Board.

The Guardians, anxious to meet the difficulty, though not desirous of incurring the expense of a second workhouse away from the parish, after much consideration of the question, proposed a compromise to the Local Government Board, viz., to add to the area of the present site by purchasing the adjoining properties, comprising Cook's-terrace, &c., thus adding materially to the area of the site, and having the effect of almost entirely surrounding the present site by open space.

The Local Government Board perceiving the great advantages of the additional area, and being also desirous of reciprocating the concession made by the Guardians, consented, under certain conditions, to the proposal which had been made to them. Consequently, in March last the Guardians selected five architects to compete for the appointment of architect, the conditions of the competition providing that each competitor should send in two schemes, one to show the whole number,—about 2,000,—on the existing site, and the other to include the area of Cook's-terrace, which would necessitate the demolition of less of the old buildings, six weeks being allowed for preparing the plans. The several designs and reports were referred to Mr. Arthur Cates to report upon, the result being that the Guardians selected the drawings of Scheme B, sent in by Mr. H. H. Bridgman, A.R.I.B.A., estimated to cost 57,475*l*., Scheme A being estimated at 72,262*l*., including the entire reconstruction of the drainage. We illustrate this week the ground-plan and view of Scheme B. The arrangement adopted preserves intact all the modern buildings on the site, also the original workhouse block in front erected in 1809, since which time additions have from time to time been made without due regard to the ultimate requirements of the parish or fully utilising the great advantages of the site, which is bounded on the east and south by the St. Pancras Gardens and the railways, and by wide roads on the other sides. The existing buildings on the south side, which are to be removed, stretch in parallel lines along the frontages, whilst the new blocks will be placed at right angles to the boundary to permit the sun and air to have free access to the interior of the site, the number provided for being 2,000, classified in the various blocks, men on one side and women on the other.

The probationary wards are placed at the entrance to the workhouse, and provide for 40 of each sex, with complete day and dormitory accommodation; of these, isolated wards are provided for each sex. The main block will be altered and slightly added to for baths, lavatories, water-closets, &c., whilst one wing will be removed. The chief offices will be located here,—the master, assistant master, matron, chaplain, &c. 225 able-bodied men and women are provided for, 20 married couples, and a part of the aged and infirm, who can during the day get about and go to the general dining-rooms.

Various improvements have been made to this block, which stretches across the front of the site, but with due regard to the fact that it is an old two-storied, though fairly substantial, building, erected in 1809,—in fact, the original workhouse,—and it is quite probable not many years hence it may have to give place to other buildings, in order that the site may be used to greater advantage.

The remainder of the aged and infirm, making a total of 615, are placed in blocks 33 and 44, which include all the necessary day and night accommodation.

The list of references will show the appropriation of the various parts of the building.

The Cook's-terrace block, which does not appear on the plan, but is shown on the left-hand side of the view, forms an important part of this scheme. The instructions stated that this area should be utilised for the chronic, infirm, or bedridden inmates of the workhouse, and that the medical officer and the head nurse should be accommodated there. The competition plans provided for 384 of each sex on five floors, with ambulance lifts in the staircases, the wards being 100 ft. long by 40 ft. wide, on either side of two central staircases, back to back, for men and women respectively, with bay windows overlooking the St. Pancras Gardens. This arrangement, however, is to be altered,—as will probably be some other parts of the general scheme,—and all of one class are to be placed there, with only one staircase, separate kitchen accommodation being provided for them.

We shall probably give further illustrations of this block as it is intended to be erected, and which we understand is the first portion of the work that will be proceeded with.

The thermhydric stoves and hot water will be adopted for heating the large wards. The ventilating throughout has been carefully studied, provision being made for the admission of warm fresh air, and for carrying off the products of combustion. The drainage of the entire workhouse will be reconstructed in an efficient manner.

All the various baths, lavatories, and water-closets are provided, the latter in all cases built out with intervening lobbies.

Safety from fire will be sought for as far as possible, both by rendering the various blocks practically fireproof inexpensively, and by providing the necessary fire apparatus throughout.

Airing spaces divided off with covered sheds and seats are provided for the different sections, and every requisite provided to make it a completely classified and efficient workhouse.

PROPOSED MUNICIPAL BUILDINGS, GLASGOW.

We have before now described briefly the design, by Mr. W. Young, for the Glasgow Municipal Buildings, selected for execution as the result of the competition. We now give the principal elevation, which is before George-square, and add some additional particulars. The central part forms the approach to the quadrangle, over which is the Council-chamber, expressed by coupled Corinthian columns, backed by pilasters, and surmounted by an upper story, also formed of Corinthian columns, crowned by a pediment. This pediment has 60 ft. of frontage, and the apex is 96 ft. above the level of George-square, while on either side of the pediment rise two belfry towers, 18 ft. or 20 ft. in height. Immediately below the Council-chamber is the entrance to the quadrangle and the main staircases leading to the floors above. The quadrangle is approached by a spacious loggia, having three wide archways, and forming a striking feature in the interior of the structure. The central archway, being intended for carriages, rises to a height of 25 ft., and it is 12 ft. in width. Two side doorways, 17 ft. high, and similar in style, form accesses to the main staircases. Above the central floor, occupied by the Council-chamber, are the upper and saloon stories, lighted from the roof. The two under stories of this, as well as the other fronts, are treated as a basement, with rustic stonework, relieved with coupled Ionic columns and pilasters, between which the windows are placed. Behind the central pediment rises the grand tower to a height of 190 ft., and surmounting the apex of the pediment to a height of 96 ft. At its base, which is about 35 ft. square, and for about 20 ft. above the apex, the treatment is plain rustic masonry, without openings. Overhead are other two stages formed of Ionic pillars, above which rises a circular colonnade of Ionic pillars. The colonnade is about 14 ft. in diameter, and is surmounted by an elongated stone dome. At the base of the dome the effect is enriched, and the tower is made to graduate into the colonnade and dome by the introduction of statuary. The central front projects some 7 ft. or 8 ft. beyond the line of the building, and between it and the wings on either side is a recess forming a screen. The wings, which, like the central front, also project beyond the screen, terminate with towers rising some 48 ft. above the front balustrade.

It may be stated that all round the block of buildings the third floor is architecturally emphasised. In the George-street front the council-chamber is thus specialised, and in George-street the banqueting-hall is placed on the third floor, with double rows of massive, Corinthian pillars supporting an entablature surmounted by a balustrade. Here, as in the other fronts, the wings are formed by a repetition of the tower front in George-square, and are in every way similarly treated as to projection and detail. In the John-street elevation the Dean of Guild Court forms the leading feature, placed as it is on the third floor. Architecturally it corresponds with George-square, although the details are of a simpler character. The Cochrane-street front has a doorway or carriage entrance, 22 ft. high and 10 ft. wide.

The leading features of the whole design may be said to consist in the handsome treatment of the third floor all round, and in the two under stories forming a massive basement, broken by Ionic pillars and surmounted by a bold continuous line of cornice, a similar line of unbroken cornice being carried over the windows of the third or principal floor. The appearance of the building is relieved from all sense of flatness by the treatment of the centre and wings in the several fronts, and this feeling is further conveyed by the author having caused the upper floor all round to recede some 7 ft. or 8 ft. from the line of the lower stories. This effect is obtained by the columnar formation of the principal floor. Considerable care has been taken with the quadrangle fronts, which form a most interesting architectural feature of the building. The general treatment is in strict harmony with that of the street elevations, the base being Ionic surmounted by Corinthian pillars. As to the internal arrangements, two spacious staircases lead to the Council-chamber and the banqueting-hall. The latter is a noble apartment, 103 ft. by 54 ft., having a circular ceiling 50 ft. high. In connexion with it there are three elegant reception saloons, which, with four saloons of a similar class on the fourth floor, will afford ample accommodation for social gatherings of the citizens, &c. The general decorative treatment of the banqueting-hall and staircase is in harmony with the leading design, the Corinthian details being repeated.

Nos. 88 & 89, PICCADILLY.

These buildings have been erected on the site of Nos. 88 & 89, Piccadilly, and Nos. 1 & 2, Half Moon-street. The ground-floor is arranged for shops (with store-rooms under) next Piccadilly, with private entrance and one set of residential chambers next Half Moon-street. The first, second, and third floors are arranged as residential chambers; each set containing three rooms with water-closet and lavatory. The basement and fourth floor provide accommodation for housekeeper and staff of servants. The fronts are faced with red bricks, with Doulting stone dressings.

The work has been executed by Messrs. Langmead & Way, builders, of Gray's-inn-road, under the superintendence of Mr. D. Cubitt Nichols, of 3, Howard-street, Strand.

Llandudno.—A set of oak choir-stalls have just been placed in Holy Trinity Church, by subscription. The front desks are carried out with richly-cut mouldings and carved strings, with an arrangement of sunk quatrefoils separated by buttresses dividing the desks into panels. The work has been carried out by Messrs. Jones & Willis, of Birmingham and London.

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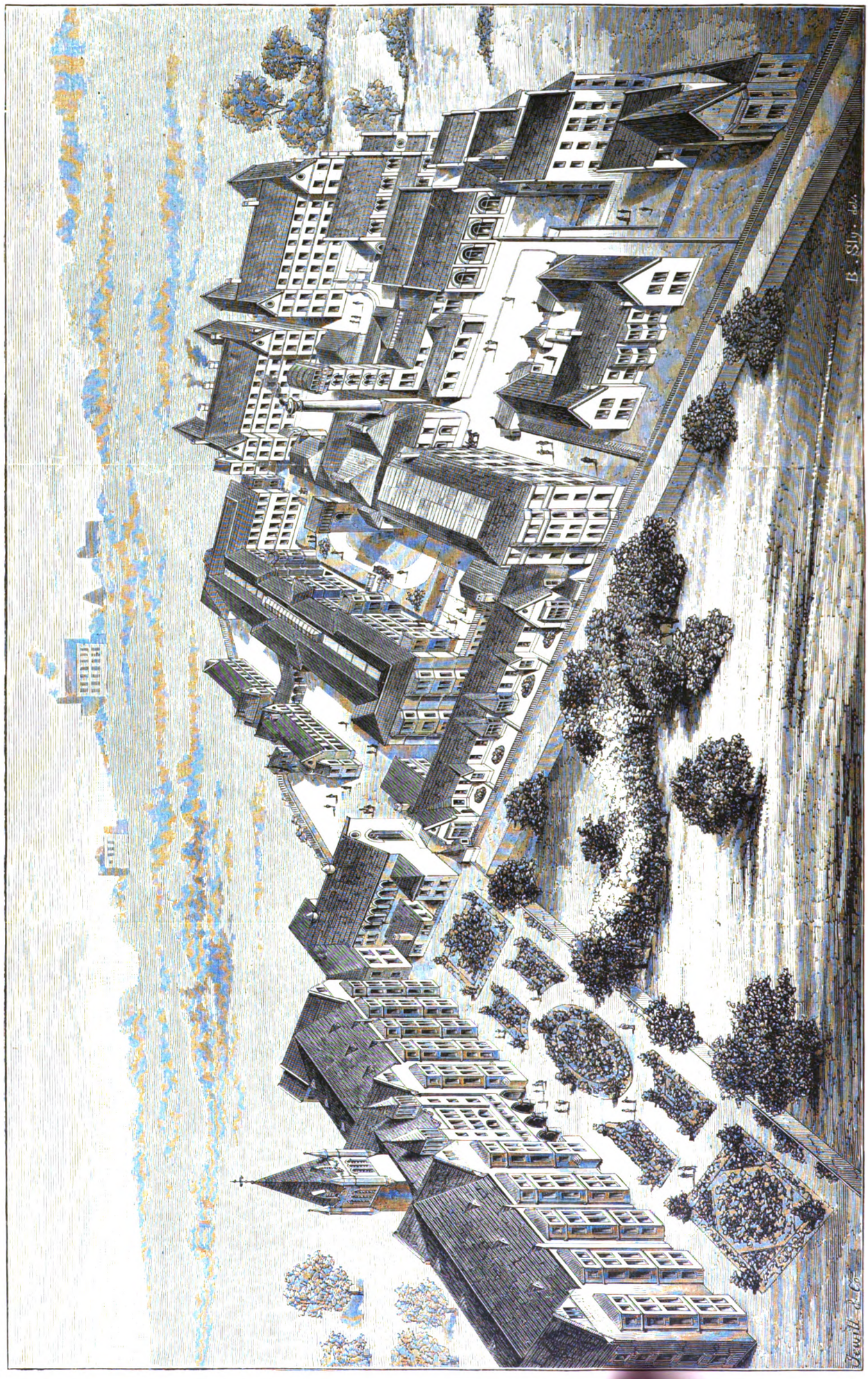

ST. PANCRAS WORKHOUSE, AS ABOUT TO BE ENLARGED.—MR. BRIDGMAN, ARCHITECT.

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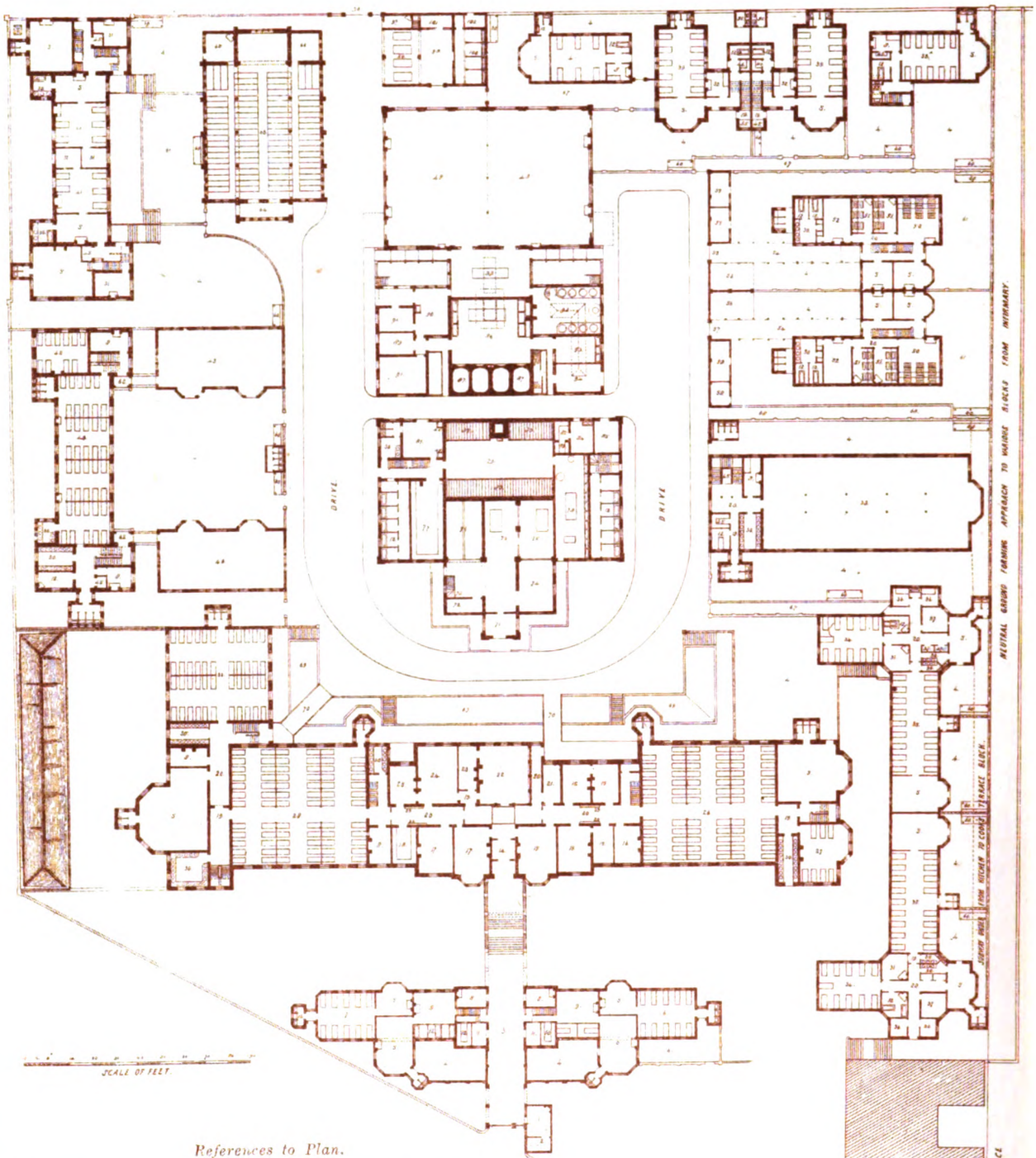

References to Plan.

1. Gate-keeper.
2. Beds.
3. Covered entrance.
4. Airing-ground.
5. Day-room.
6. Men's (10) dormitory, Probationers.
7. Women's (10) „ „
8. Attendant.
9. Receiving-room.
10. Clothes-room.
11. Store.
12. Baths.
13. Sink.
14. Vestibule.
15. Master's rooms.
16. Assistant master.
17. Matron's rooms.
18. Matron's stores.
19. Lobby.
20. Corridor.
21. Master's office.
22. Clerk's office.
23. Waiting-room.
24. Committee-room.
25. Committee retiring-room.
26. Dormitory for 71 able-bodied men.
27. Dormitory for 7 „ „
28. Dormitory for 71 able-bodied women.
29. Air-shafts.
30. Lavatory.
31. Nurse.
32. Assistant nurse.
33. Dormitory for 44 aged and infirm women.
34. 34. Dormitories for 22 men, lunatics and imbeciles.
35. 35. Dormitories for 70 men.
36. Single room.
37. Padded room.
38. Day-room for 240 men, aged and infirm.
39. Dormitory for ten men (venereal).
39A. Dormitory for 10 children, isolated and infectious.
40. Dormitory for six men, isolated.
41. Dormitory for 5 sick children.
42. Dormitory for 10 women, aged and infirm.
43. Day-room for 95 women, aged and infirm.
44. Dormitory for 44 women, aged and infirm.
45. Lift.
46. Linen.
47. Cupboard.
48. Men's dining-hall.
49. Women's dining-hall.
50. 50. School-rooms, 40 boys.
51. Class-room.
52. Dining-room.
53. Boys' entrance.
54. Covered way.
55. Boys' workshop.
56. Covered shed.
57. Girls' entrance.
58. Girls' laundry.
59. Scullery.
60. Covered seat.
61. Playground.
62. Porch.
63. Chapel.
64. Entrance.
65. Vestry.
66. Books.
67. Approach.
68. Covered and subway to supply Cook's terrace block from kitchen. (*Block not shown on plan.*)
69. Slope.
70. Bridge.
71. Pump.
72. Fuel.
73. Stairs to boilers.
74. Engineers' shop.
75. Engine-room.
76. Boilers.
77. Sorting-room.
78. Laundry.
79. Drying-room.
80. Drying-horses.
81. Receiving-room for dirty linen.
82. Disinfecting-room.
83. Hot chamber.
84. Disinfecting washhouse.
85. Mortuary.
86. Bake-house.
87. New ovens.
88. Cutting and serving room.
89. Bakers' scullery.
90. Flour-room.
91. Bread.
92. Kitchen.
93. Scullery.
94. Larder.
95. Workroom.
96. Back entrance.
97. Lodge.
98. Yard.
99. Coachhouse.
100. Stables.
101. Harness.
102. Manure.

ST. PANCRAS WORKHOUSE, AS ENLARGED

(With omission of Cook's Terrace Block).

Whiteman & Bass, *Photo-Litho* 236 High Holborn

Wyman & Sons, Printers, Gt Queen St

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Whiteman & Bass, *Photo-Litho* 236 High Holborn

Wyman & Sons, Printers, Gt Queen St

LONDON STREET ARCHITECTURE: Nos. 88 and 89, PICCADILLY.—Mr. D. Cubitt Nichols, Architect.

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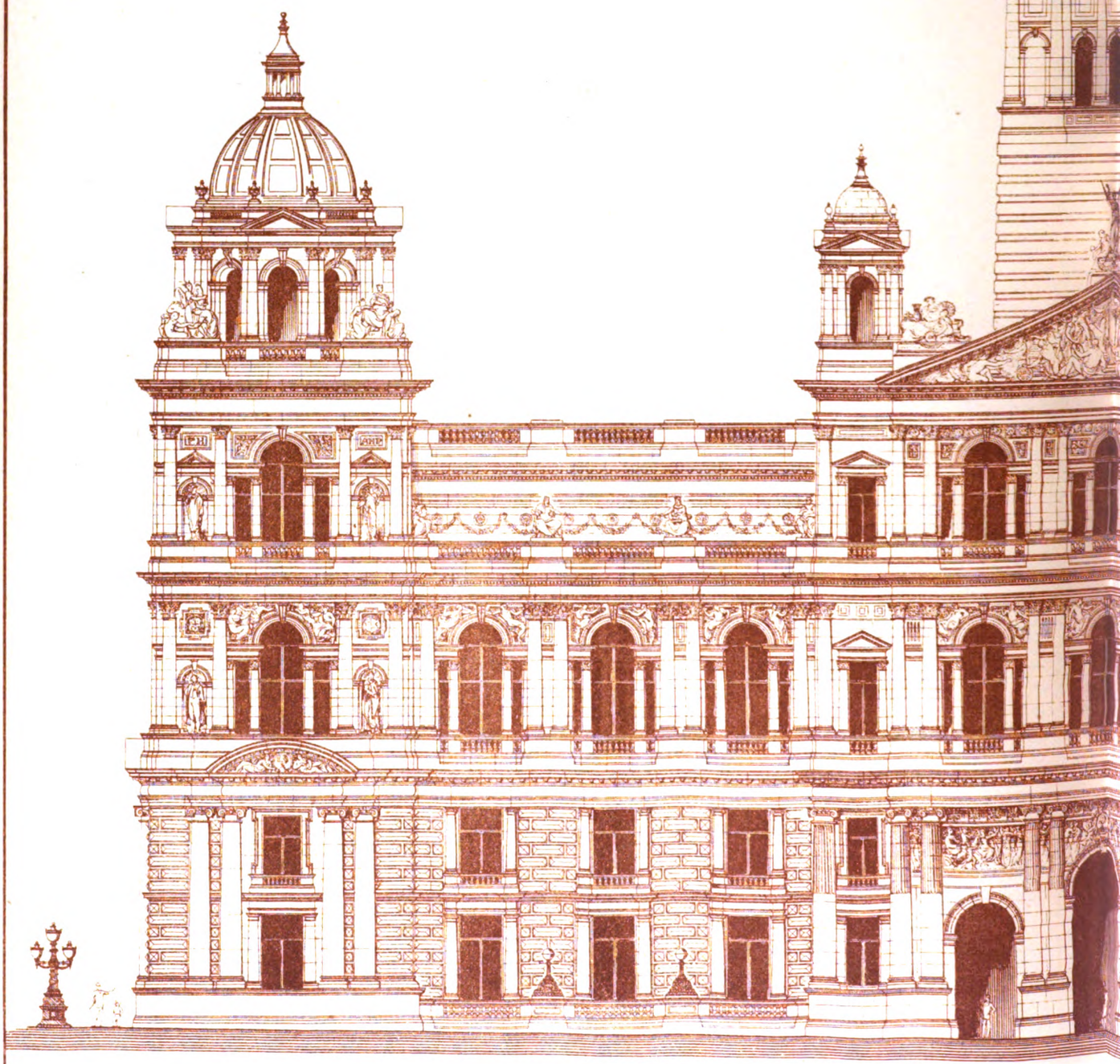
GLASGOW MUNICIPAL BUILDINGS.

SELECTED DESIGN
WILLIAM YOUNG ARCHITECT.



ELEVATION TO GR

J. Akerman Photo-lith London

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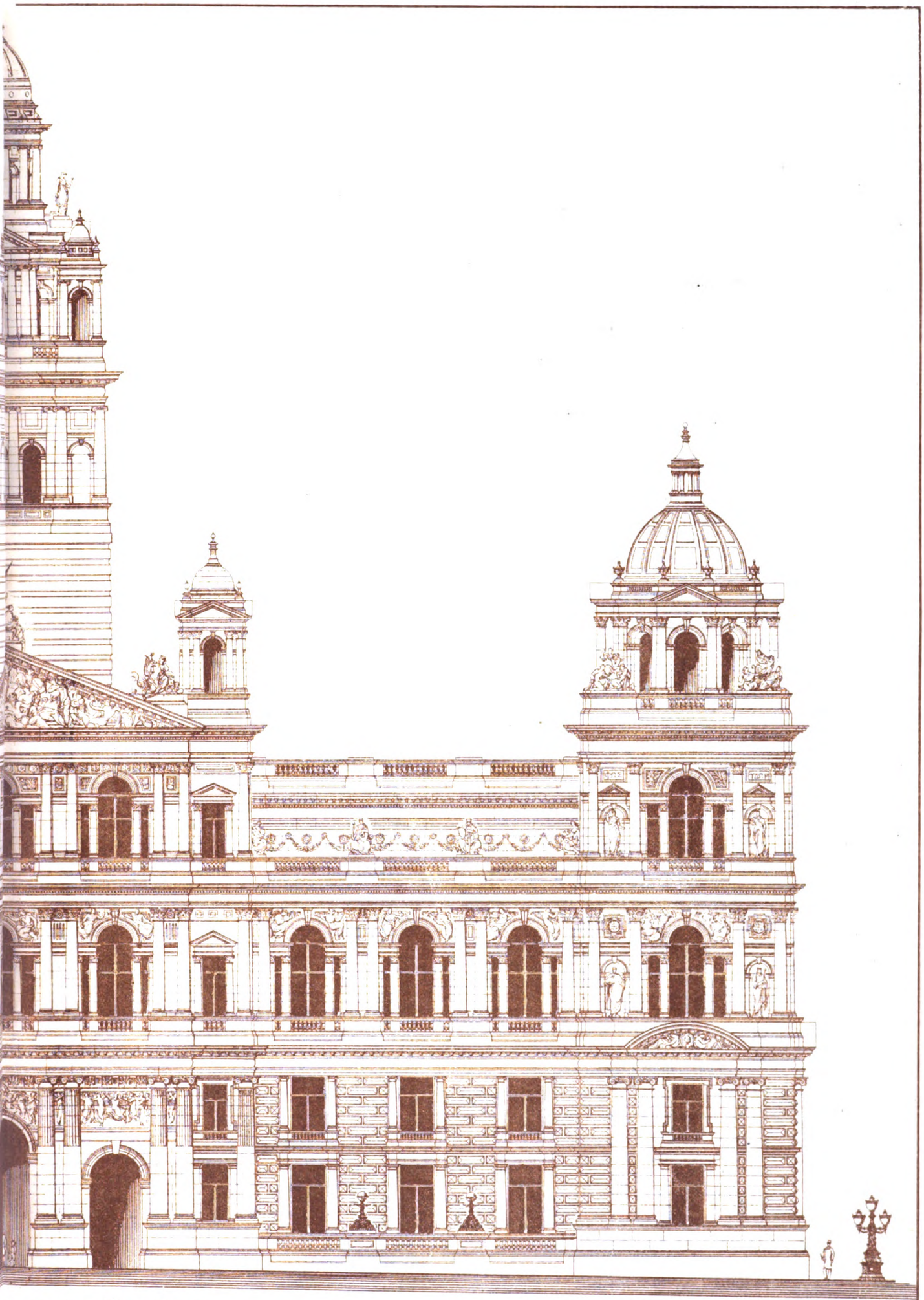

EORGE SQUARE.

Wyman & Sons Printers 7 Queen St

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BUILDERS' BENEVOLENT INSTITUTION.

ANNUAL DINNER.

THE thirty-fifth anniversary festival of the Builders' Benevolent Institution was held at the Freemasons' Tavern on the 2nd inst., the president, Mr. J. T. Chappell, in the chair. There was a large attendance of the friends of the Institution, and financially the anniversary is the most successful which the Institution has yet seen.

The usual loyal and patriotic toasts were duly proposed and honoured, Major Brutton, formerly of the Royal Marines, replying on behalf of the "Army and Navy," and referring with gratification to the distinguished part which his old corps, in common with other regiments, had taken in the recent Egyptian campaign. Captain Bird responded for the "Reserve Forces" in appropriate terms.

The Chairman, in proposing the toast of the evening, "The Builders' Benevolent Institution," observed that such an institution was eminently necessary in the building trade, for there were few trades in which so many difficulties had to be encountered, and so many risks incurred, as in the conduct of a builder's or contractor's business. The Institution, founded in 1847 by the late Mr. Cozens, had been the means of alleviating the wants of a great many deserving though unfortunate members of the building trade. He had had the pleasure of receiving a very pleasing letter from Mr. Yeo, one of the founders of the Institution, probably now the only survivor of those who met, in 1847, at the King Alfred Tavern, Lisson-grove, to discuss the best means of setting on foot such a charity. Mr. Yeo, he was happy to state, was still an annual subscriber to the funds of the Institution. The Institution dispensed its aid in what was perhaps the best and most acceptable way to the recipients, viz., in granting annuities to old and decayed members of the trade and their widows. While these annuities were not large, they were yet sufficient to enable the recipients to live with their friends and relatives without being burdens to them. At the same time, the receipt of pensions or annuities apart from residence in an almshouse did not proclaim to all the world that the recipients (many of whom once occupied good positions in life) were objects of charity. The pensions were formerly 26*l.* for men and 20*l.* for women, but of late years they had been considerably augmented, and now stood at 39*l.* for men and 27*l.* for women. Of deceased pensioners, there were 134, and there were now 26 male and 29 female pensioners on the funds of the Institution. The aggregate sum paid in pensions last year was 1,797*l.*, and when he mentioned that the funded capital of the Institution only brought an income of 643*l.* per annum, it would be seen how largely dependent the Institution was upon subscriptions and donations. The ages of the pensioners averaged about 70 years, and it was worthy of mention that on the death of a male pensioner, his widow, provided she was not less than 60 years old, continued to receive the pension given to her husband. At the present time, there were three vacancies on the list of pensioners, and for these three vacancies there were six candidates,—five men and one woman. With regard to the necessity of increasing the donations and annual subscriptions, he could not help referring,—indeed, he did so with great satisfaction,—to the great amount of good which resulted from the aid last year rendered by Mr. George Godwin,—the acceptance of whose offer and compliance with the conditions on which it was made resulting in the fact that last year the income of the Institution was greater than it had ever been. On the occasion of the last anniversary dinner, the then President, Mr. George Burt, offered, on behalf of his firm, to give a donation of 100 guineas to the funds of the charity this year if his successor could prevail upon nine other firms to contribute a like amount each. Now, he (the Chairman) on becoming President, felt that acceptance of Mr. Burt's offer was a very large undertaking, but he determined to do all he could to claim the fulfilment of Mr. Burt's promise, especially as that gentleman was kind enough to modify the condition of his gift so that it might be claimed if he (the Chairman) succeeded in obtaining 900 guineas for the funds of the Institution in a larger number of smaller donations instead of nine of 100 guineas each. He was glad to say that he had succeeded fairly well in his object, but, however large might be the aggregate of the donations obtained on this and on similar occasions, he hoped that the annual subscriptions would be increased in number. The Institution was one which was eminently worthy of the liberal and systematic support of the members of the building trade, for many of those who were now prosperous did not know how soon the day of adversity might dawn upon them. While fervently hoping that no one present on that occasion would ever be compelled to claim the aid of the Institution, he earnestly called upon them, each and all, to help the charity to the utmost of their ability.

The toast was enthusiastically received, and the secretary, Major Brutton, proceeded to read the subscription-lists. The Chairman's list presented the handsome total of 1,246*l.* 3s., and other donations received by him subsequently to the dinner make the total of his list 1,277*l.* 18s. The Chairman's list included a donation by himself of 105*l.*, a donation of 105*l.* by Mr. (Ex-Sheriff) George Burt; and a donation of 105*l.* by Messrs. Lucas Brothers. Other subscription-lists brought up the grand total to 1,671*l.* 3s., an amount unprecedentedly large.

Mr. George Burt, in proposing the health of "The Chairman," said that for nearly twenty years he had known Mr. Chappell, of whose ability and judgment he entertained the highest opinion. Mr. Chappell's energy and perseverance were sufficiently testified to by the result which had been announced of his labours on behalf of the Institution. To these qualities he owed the eminent position to which he had attained and the esteem in which he was held by all who knew him.

Mr. Chappell, in replying, said that, like Mr. Burt, he claimed to be a practical man, and, like him, had worked his way up from the lowest round of the ladder. His experience told him that unless a man had a thoroughly practical knowledge of the business he could not succeed as a builder in these days of keen competition. He was very strongly disposed to think that builders' tenders at the present time were too often sent in with little regard for what were only fair prices for the work which they represented. Instead of tenders being what, he ventured to think, they ought to be, viz., estimates for work at a fair value, they seemed to be based upon conditions more suggestive of those of horse-racing than of anything else. Having due regard for the facilities that some men might have over others for the execution of a particular work, both in stock and in the *personnel* of their staff, he was bound to say that he could come to no other conclusion than that which he had stated. He had no doubt that this condition of things was largely due to the badness of trade which had been experienced of late years, and from the laudable desire of those who had a large number of deserving men on their permanent staff to find employment for them rather than dismiss them. While it was only right that they should show such consideration for their *employés*, it was obvious that if carried too far it would be ruinous.

Mr. Blyth, in proposing "The Vice-Presidents and Trustees," coupled with the name of Mr. Thomas Stirling, referred to the great services done to the Institution by a recent President, Mr. Thomas F. Rider.

Mr. Stirling briefly replied.

Mr. Colls proposed the health of the Treasurer, Mr. George Plucknett, J.P., and spoke of the valuable services rendered by that gentleman to the Institution during the thirty years that he had held the position of treasurer.

Mr. Plucknett, in replying, dwelt upon the necessity of obtaining a larger number of annual subscribers to the funds of the Institution, so as to render the prosperity of the Institution less dependent upon donations, which fluctuated in amount. He did not think that the number of subscribers to the Institution was at all commensurate to the number of builders in the metropolis. There were in London upwards of 2,000 master builders or builders' merhants, and within a circle of ten miles round London there were probably double that number. But the Institution only had about 700 subscribers. He trusted to see this number largely augmented, for in all such institutions the annual subscriptions should be the mainstay.

Mr. Stephen Phillips proposed "The Architects and Surveyors," coupled with the names of Mr. Harrison and Mr. W. B. Brown, who briefly acknowledged the compliment.

The concluding toast was "The Committee and Stewards," proposed by Mr. Dove, and responded to by Mr. T. G. Smith.

THE DERBY ART GALLERY.

ON Saturday last there were great rejoicings in Derby, the occasion being the formal opening of a new Art Gallery (the gift of Mr. M. T. Bass, M.P., and erected at a cost of 3,000*l.*), the opening of the Arboretum to the public free for ever, and the turning of the first sod of the Little Chester recreation-grounds.

The new Art Gallery is described in the *Derbyshire Advertiser* as being in a mixed style of architecture, partaking somewhat of the Tudor and Gothic styles, with, perhaps, a dash of the Caroline Classic, such as may be seen in the window-heads of the County Hall. The two main rooms, 60 ft. by 24 ft., are of fair height and proportion. The lower apartment is lighted mainly by side windows in the Strand, and, in part, by a fanlight in the adjoining annexe. The upper room is lighted entirely from the ceiling, and is therefore admirably adapted for showing pictures and sculpture. Considering the nature of the site, the utmost advantage has been taken of the floor space. The structure has been well and substantially built, and is admirably fitted for the purposes to which it will be devoted. The entrance-hall and lobby, necessarily confined, lead to a light and easy staircase of Hopton stone, which affords ample facilities for approaching the upper story, where a connexion has also been made with the Bass Free Library and Museum. The heating and arrangement of gas are well spoken of. An even temperature is preserved throughout the building, and the gas jets are so placed that every case can be accurately inspected by night as well as by day. The ventilation, perhaps, is not quite so perfect, but the experience of crowded occasions will best prove if the ingress of fresh air is adequate for the purpose. The elevation of the building has been so designed as to render possible the continuation, at some future period, of a similar frontage to the Free Library premises, which would then form one of the most striking features in the Strand, and be a decided ornament to this part of the town. The architect of the new building is Mr. J. Somes Story, who has carried the work out under the superintendence of Sir Philip Cunliffe Owen, K.C.B.

The Gallery is now occupied by pictures and specimens of industrial art, mostly contributed from South Kensington Museum.

THE NORFOLK AND NORWICH ARCHÆOLOGICAL SOCIETY.

THE members of this society recently visited several buildings and places of interest in the City of Norwich and its neighbourhood. Among the places visited was Magdalen Chapel Hospital and Fair, where Mr. T. G. Bayfield read some notes and made some interesting observations. St. Augustine's Church was next visited. Mr. Phipson read notes upon it; the Rev. C. R. Manning undertaking a similar duty with respect to St. Mary's Coslany Church, and also as to St. Michael Coslany, on the brasses in which church the Rev. W. F. Creeny contributed a paper. Mr. E. Boardman read a paper on St. George's Colegate Church, and the Rev. C. R. Manning was again the *cicerone* at St. Clement's; while Dr. Bensly read a paper on "The Old Meeting House." Opposite St. Mary's Church is a general shop and beer-house, known as the Rosemary Tavern, the interior of which the company inspected. Ascending to the upper floor, the antiquaries found themselves in a subdivided apartment, retaining characteristic work in arches and woodwork of the fourteenth or fifteenth century. Little or nothing is known of these portions of an old building so curiously preserved amid much that is modern, save that it is called "Pilgrims' Hall." It may have been a sort of hospice for the accommodation of some of the many pilgrims who, in the Middle Ages, visited Norwich or passed through it to offer their devotions at the famous Norfolk shrines. Down Dial-yard, opposite the Church of St. Michael at Coslany, are relics of another grand mansion, whose building and grounds extending to the river may be traced, and the ruins of a demolished rookery swept down to make way for an extension of Messrs. Bullard's premises. Some of the fine carvings and panellings from this old mansion were a few

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years ago purchased by Lord Stafford. Here lived one of the merchant princes of Norwich in the sixteenth century, William Coo, mercer. William Ramsay, mayor, conveyed this property to William Coo, in 1508, together with other edifices, appurtenances, and a garden described as a "bitmay" from being surrounded with ditches of water. Amid the heaps of rubbish which Messrs. Bullard have not yet cleared away stand a few fragments of the mansion and edifices. A large handsome mullioned window, set in thick walls, lights what is now a workshop, but which, two or three centuries ago, was no doubt a fine hall, and out of it the inmates looked upon the "bitmay" stretching down to the river side. Mr. Fitch pointed out amid the rubbish the sites of the old ditches, now vaulted over. When Sir Francis Gawdy, Chief Justice of the Common Pleas, possessed it in Queen Elizabeth's days, the garden had ceased to be a "bitmay," and had water only on three sides. In 1640 the widow Herring owned the mansion and grounds. These facts concerning the mansion were contributed by Dr. Bensly and Mr. Fitch upon the authority of the late Mr. Harrod. Subsequently another fine old mansion was noticed, that of Henry Bacon, merchant, in Colegate-street, opposite Bridge-street. Bacon's initials, merchant's mark, and the date 1566 are carved on the spandrel of the doorway of the substantial flint-built mansion.

RAFFAELLE'S STATUE.

On the 28th of March, 1883, Italy will celebrate the four-hundredth anniversary of the birthday of Raffaelle Sanzio di Urbino. The citizens of Urbino have decided to honour their immortal fellow-townsman by the erection of a statue, for which the committee have recently invited competitive designs. The prizes are to be three of the respective values of 1,500, 1,000, and 500 lire. It is intended that the statue shall be in white Carrara marble, with reliefs in bronze. The total cost is estimated at 8,000 lire. The competitors are to send in their drawings by the 28th of February, 1883, to the Raffaelle Academy of Urbino. A month afterwards the designs will be exhibited to the public at large, and the decision of the jury announced.

The monument is to be erected on the great square in front of the Palazzo Ducale of Urbino.

PHOTOGRAPHIC STUDIO IN OXFORD STREET.

The name of Barraud has long been associated with photography (his famous picture of the Royal Society will be remembered by many of our readers), and now being about to make a departure from 263, Oxford-street, Mr. Barraud has provided himself with premises which will move the envy of his *confrères*. Externally, the upper portion of the building is carried on polished red granite piers, having foliated bronze caps supporting black marble fascias. The superstructure is composed of red Fareham brickwork, with Mansfield stone dressings, interspersed with terra-cotta and Doulton ware decorations, the whole forming a pleasing façade.

The visitor enters, through a vestibule of carved oak panelling filled in with stained glass, a gallery, harmoniously enriched with a carved ceiling, charming oak mantelpiece, and screens, the most noticeable feature, however, being the staircase of various inlaid woods, embellished with carvings; this leads to the reception gallery, similar in arrangements and ornamentation to the ground floor. Here Mr. Barraud has, amongst the other conveniences which he has afforded, constructed a lift, the cage of which is handsomely designed. This lift glides up and down between the first-floor to the studio (situated on the roof of the premises) with the greatest ease and smoothness, stopping itself automatically at the top and bottom of its destination, an ingenious brake apparatus having been especially devised for it. The well-known firm of Messrs. Waygood & Co., Falmouth-road, Great Dover-street, has executed and fixed it with their usual care. Its motive power is supplied by one of the "Otto" silent gas-engines.

The studio is very convenient; it is entirely constructed of polished pitch pine and plate glass, designed in similar style to the rest of the building, and supplied with every modern convenience.

The various floors between the reception gallery and studio are used as dressing-rooms, and other apartments necessary for the efficient working of the establishment.

In all respects the arrangements appear to reflect credit on the architect, Mr. H. H. Collins, of 61, Old Broad-street, whose design has been ably carried out by the builder, Mr. Downs, of Hampton-street, Walworth-road, and by the carver, Mr. Sansom, of Kennington-road. The stained glass has been executed by Mr. Gibbs, of 397, Kingsland-road.

HASTINGS CASTLE.

A very friendly local critic writes, with reference to a late article upon Hastings Castle, that the castle does not stand upon chalk. No doubt the chalk ceases at Beachy Head, and the castle stands actually upon the Wealden formation, the middle division of which is known as "Hastings sand."

The old port, he observes, lies east, not west, of the castle. The fact is that the small stream that made the port runs down west of the castle, but turns eastward before reaching the sea; at least, this seems to have been the case.

It appears also that the writer mistook the roof of St. Mary's Chapel for a gas-holder, which it is admitted to resemble. No doubt an apology is due to the chapel authorities, and it is to be hoped that the resemblance is continued to the exterior.

WHERE WAS THE "JOYOUS GARD"?

In the "Morte d'Arthur" (the original edition of Caxton) frequent allusion is made to a particular stronghold, or castle, called the Joyous Gard. It is mentioned as the castle of Sir Lancelot du Lake that he had won with his own hands, and described as garnished and furnished fit for a king and queen to have sojourned in it. When Sir Tristram brought La Beale Isoud from her home, Sir Lancelot placed it at their disposal, and this noble knight and "gay-be-seen" lady occupied it for some time. King Arthur visited it on more than one occasion, and it was to Joyous Gard that Sir Lancelot carried Queen Guenevere when he rescued her from death at Carlisle. When Sir Thomas Malory describes the death of Sir Lancelot (in the same original edition printed by Caxton) he mentions that he desired the Bishop of Canterbury to see that his body should be taken to Joyous Gard; and states precisely "some men say it was Anwick, and some men say it was Bamborow."

It may be impossible to determine whether it was Alnwick Castle or Bamborough Castle that once bore the designation of Joyous Gard; but it cannot be otherwise than interesting to inquire which of the two is the more likely to have been the distinguished edifice in question, especially at the present day, when there is a proposal on foot to establish a hospital within the precincts of the latter. Curiously, antiquaries of a former time, from Kingston to Sir Henry Ellis, repeated from one another that Berwick Castle was the *château de la joyeuse garde*, and Bamborough was the *chastel orgueilleux* (see Ellis's "Metrical Romances"). But there appears to be no reason why we may not return to the opinion popularly entertained in Sir Thomas Malory's time, that it was either Alnwick or Bamborough.

Long before the poet-laureate revived an especial interest in the proceedings of the Knights of the Round Table, there lay in the church of St. Aidan, Bamborough, a carved stone figure, always spoken of as the effigy of Sir Lancelot. It appeared to be an ordinary representation of a knight, such as was usually placed upon tombs in the days of the Plantagenets. But the associations of the place had so encrusted it as to cause it to be identified as a representation of King Arthur's most famous knight. This traditionary acceptance of the association of the site may count for one piece of evidence in favour of Bamborough Castle being the Joyous Gard.

Another fact corroborative of this view is the circumstance that there is no allusion whatever in Sir Thomas Malory's version to the river that flows before the northern walls of Alnwick Castle. King Arthur besieged the Joyous Gard whilst Queen Guinevere was in it, and came close below its walls; which he could not have done if there had been a river surrounding them. Bamborough Castle is built on the top of a rock that rises so abruptly from the sea-shore as to be quite inaccessible except from the land side of it, where there is a plain such as the king is described as occupying with his forces. Thus there are two points in favour of Bamborough.

THE SAFETY OF LONDON THEATRES.

The Criterion.—At the meeting of the Metropolitan Board of Works on the 3rd inst., the Building Act Committee presented a report recommending that the Lord Chamberlain be informed that the Board, having regard to the peculiar circumstances surrounding the case of the Criterion Theatre, in Piccadilly, are of opinion that the theatre is entirely unfit for a place of public entertainment, and that Mr. R. Vigers, in reply to his letter, asking that the owners of the Criterion Theatre might have an opportunity of conferring with the Board as to the structural defects of the building, be informed of the decision of the Board upon the foregoing recommendation. The report went on to describe the position of the theatre, that it was not originally intended as such, and that no structural alteration that could be made would afford a sufficient means of egress in the event of a panic or alarm of fire. The report was unanimously adopted. With reference to this, Mr. Thomas Verity, the architect of the theatre, writes:—

"This theatre was opened in 1874, and at the time of its completion the Board of Works certified that it had been constructed in accordance with the provisions of the Building Act, and to the satisfaction of their district surveyor; indeed, the building could not otherwise have been opened. No alterations in its arrangements have been made since that time.

All the staircases and corridors are of fireproof construction, and no question has ever arisen as to the sufficiency of its approaches or exits. So far as I am aware, the only objection ever raised was its position, which necessitated artificial ventilation. This has been so successfully accomplished that a comparison with other theatres shows that even in this respect it is better than the majority of other houses. As to the usual risks, this theatre is entirely free from them. There are no carpenters' or scene-painters' workshops, all doors open outwards, and every precaution is taken to insure the safety of the public. The fireproof corridors are alone sufficient to contain the whole audience.

Up to the present time the proprietors have not had the opportunity of conferring with the Board as to the possibility or desirability of making any alterations. When the matter comes before the arbitrator, I have no doubt I shall be able to show that the Board has arrived at a judgment which will not be sustained."

Covent Garden.—The Building Act Committee further reported that they had carefully considered the question of the present arrangements for the egress of the public from, and the prevention of fire in, the Royal Italian Opera-house, Covent Garden, and the improvements which it was desirable to effect in the same under the provisions of the Act of 1878, and that they were of opinion that the following alterations of a structural character should be made by the owner, in order to remedy existing defects in the building:—That a proper proscenium-wall be built, to divide the stage from the auditorium; that such wall be carried down to the level of the foundations, and carried up to the height of 3 ft. above the highest part of the roof to which it adjoins; that a wall be built in continuation of the proscenium-wall, under the proscenium opening, such wall being carried up to the under side of the stage, and carried down to the level of the foundations, and that all openings in this wall, and in the walls dividing the dressing and other rooms, at the side of the stage, from the staircases adjoining, be closed by wrought-iron doors in wrought-iron frames, fitted without woodwork, and hung so as to shut automatically That the floors of so much of the workshop and store-rooms in the roof of the theatre as extends over the auditorium be formed of fire-resisting materials, or covered with Drake's concrete slabs; that an additional staircase, with the necessary exits, leading directly into the street, be provided from the gallery and the amphitheatre on the south side of the house; that strong handrails be fixed on both sides of all staircases, where not already provided, and that a central double handrail be fixed to the grand staircase; that the doorways between the theatre and the Floral Hall be closed with wrought-iron doors in wrought-iron frames, fitted without woodwork, and hung so as to shut

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automatically; that the doors throughout the building be made to open outwards. These and other recommendations were unanimously agreed to.

THE LATE MR. SIBLEY.

We mentioned last week the death of Mr Robert Lacon Sibley, District Surveyor of Clerkenwell, and now add a few words to the short notice then given. The deceased gentleman was the oldest son of Mr. Robert Sibley, who died in 1849, having been County Surveyor of Middlesex, District Surveyor of Clerkenwell, and Surveyor to the Ironmongers' Company. Mr. Robert Sibley carried out Hanwell Asylum and numerous bridges for the county, and had an extensive practice in arbitrations, valuations, rating, and similar business. Mr. Robert Lacon Silbey entered his father's office in 1833, after studies at University College; was a good draughtsman; was admitted to the School of the Royal Academy in 1836; and showed considerable talent in architectural design.

On the death of his father, he was appointed by the magistrates of Middlesex to the District Surveyorship of Clerkenwell, under the Metropolitan Building Act. He was also elected an Associate of the Royal Institute of British Architects in 1849, and a Fellow in 1861. In his later years, however, he seldom went beyond the regular work of his appointment. About two years ago, in the course of official duty, he visited a cellar and inhaled poisoned air, which affected the blood; and though generally in sound health up to that time, tumours developed themselves, one of which broke into the windpipe and caused his death. The warmth and strength of his private friendships are spoken of by those who knew him long and well.

THE NEW BRIDGE OVER THE LEA, AND THE HACKNEY MARSHES.

The long-agitated bridge over the Lea in the Hackney Marshes, the necessity for which we pointed out in these pages upwards of a dozen years since, is now being proceeded with by the Hackney Board of Works. The operations, however, partake of a tentative character, as conflicting interests obtain on the commons known as the Marshes. There are manor-lord claims and copyholders' rights on these common lands, and conditions are endeavoured to be exacted which the local authorities do not think they have a right to comply with in the public interest. As the Lea divides Middlesex from Essex, one pier of the bridge might be supposed to be in the latter county and the other in the former, but a portion also of the Hackney Marshes, so called, occupies the Essex bank of the Lea. At Temple Mills, near the site of the new bridge, there is an ancient mill-race, which diverges from the old course of the Lea further up the stream, and reunites with the old river again in the immediate vicinity of the new bridge. This mill-stream by many is looked upon as constituting the real border-line, and not that where the new bridge is being erected. Be the facts what they may, the Hackney authorities are building a pier on the Middlesex side of the Lea, the progress of which has been delayed by recent floods, and when this pier is finished they will proceed with the erection of the opposite pier, although some opposition is anticipated. There can be no doubt that there is a great need for the bridge, as, for long years there has been only an old and shaky timber foot-bridge. Notwithstanding, numerous vehicles are driven this way, and men prefer fording the river, and often swimming their horses through the water, sooner than taking the long journey round by Bow to Stratford, or the equally long journey round by Clapton and Lea Bridge-road to Low Leyton. On several occasions lives have been lost in fording the river at Temple Mills. Apart from the piers, the new bridge will be an iron structure, and its completion is likely to give a fresh impetus to speculative building on either side of the Lea. The open spaces of several acres in extent which existed less than ten years ago are now covered with buildings, now known as Clapton Park. Both at Clapton and Hackney Wick nearly all the available land has been covered to the very border of the marshes, and even these hundreds of acres of commons, free to the people for recreation, and often flooded in the winter, are threatened by building speculators, who are looking with wistful eyes, and are ready to commence operations if manor lords could give the word. It behoves the people to keep their eyes open in this direction, or a march will be stolen upon them under one pretence or another, and a portion of the Hackney Marshes appropriated for building land for the erection of speculative dwellings of the worst description. The character of the houses erected on the monster rubbish-shoots of Hackney Wick was described in our articles in 1873 on "Homes in Homerton and Hackney Wick," and future dwellings, if erected, would be likely to be of the same kind.

Since the above was written, a decision has been given by Mr. Commissioner Kerr in the City of London Court, having an important bearing on the question of public rights on the Hackney Marshes. The East London Waterworks Company prosecuted Mr. Jacob Base, a well-known parish contractor, the plaintiffs' company seeking to recover 10*l.* damages against the defendant for the illegal deposit of rubbish on the Marshes, and also damage to a portion of the wall of the River Lea. The defendant, though first inclined to resist the company, subsequently, but not until the action was commenced, removed the rubbish, and repaired the wall to the satisfaction of the company. As it might be inferred from the case that the private rights asserted by the company and other private rights claimed from time to time by other claimants of parcels of marsh land, override the public rights, a few words of explanation are necessary. The East London Waterworks Company, through their Acts some years ago, acquired certain parcels of land along the Lea River in connexion with their service, and certain works were carried out, and, of course, their absolute property needs protection from injury. Apart from this, however, the immemorial pasturage and commonage rights remain intact, and custom and ancient usage on the part of the people constitute their rights in the marshes as a free common and recreation ground, only subject to certain restrictions at stated times of the year. It is at the same time only proper that nuisances should be put down, and in this respect both private and public claimants to rights should join issue. The local sanitary authorities have been too long negligent of their duty, and thus the fine expanse of open lands, comprising some hundreds of acres, and acting as a healthy lung to East London, was fast becoming injured by the operations of parish dustmen, brickmakers, and a low class of speculative builders. As we have said already, we will repeat again, the public will have every need to be on their guard against encroachments and the extinguishment of their public rights.

COMPETITIONS.

Leith.—Six architects, who were invited to send in plans for a Sailors' Home, to be erected in Leith, have accepted the invitation, and a committee has been appointed to examine and report upon the plans. Messrs. Anderson & Browne, of Edinburgh, have furnished a design in the French style, of the period of Francis I.; Mr. Hyppolyte J. Blanc, Edinburgh, has adopted the Scottish Baronial style, as has also Mr. Charles S. Johnston, Edinburgh. The design of Messrs. Ireland & McLaren, of Dundee (architects of the Dundee Sailors' Home), is in the Elizabethan style; that of Mr. R. Wilson, of Edinburgh, is of French Renaissance character; and Mr. George Craig, of Leith, sends two sets of designs, Gothic in style. The estimates range from 7,005*l.* to 7,700*l.* The committee appointed to examine the plans have, after visiting similar institutions, and careful consideration, selected the plans submitted by Mr. C. S. Johnston, architect, Edinburgh, subject to certain conditions to be arranged hereafter. Mr. Johnston's design is in the Scottish Baronial style of the seventeenth century, with an elevation of four stories, having in the centre a tower with flat roof for distant outlook. The estimated cost of the building is about 7,000*l.*

Railway Bridge across the Indus at Attock.—It has been announced that the bridge across the Indus at Attock is all but completed, and that Lord Ripon, the Viceroy of India, will pay a visit to the spot when the opening ceremony is to be gone through.

SYDNEY, NEW SOUTH WALES.

Sir,—It is now three years since I wrote to you as an architectural emigrant concerning the shipment of emigrants from London. I have now to speak of New South Wales, Australia. It is of vast extent, and in many parts has a beautiful soil, but for the most of its area is very deficient in water supply, there being subterranean water-courses, which make the country appear uninhabitable, and have been the chief drawback to *bonâ-fide* settlers. The Government have now seen the necessity of employing diamond-drills to make practicable travelling for teamsters to convey provisions and merchandise into the interior; for with last year's drought no water was to be had on the roads for hundreds of miles, nor pasture for the cattle; and the Government, seeing that the want of water would ruin certain districts, tardily consented last month to the employment of diamond-drills. During last winter, in some districts chaff was 50*l.* per ton, and food at famine prices, owing to teamsters not being able to get their teams from place to place. It has been reserved for Messrs. Amos, the railway contractors, to prove the practicability of obtaining water in the Bush. Where a railway is to be constructed, at equal distances of ten miles they sank for water to supply their men and cattle; by using the diamond-drill they came upon an unlimited supply, which will go far to induce men with small means to take up lands for cultivation.

The Government have been very slow in promoting railways, compared with those of other colonies, until the last few years, and now every district is agitating for its line: they consist of a single line of rails, and the influx of trade to and from Sydney is becoming greater and greater every year, as the lines increase. It is sought to connect the capitals, Adelaide, Melbourne, Sydney, and Brisbane, by a continuous line, and it is completed nearly to the Queensland frontier at Uralla, which was opened last month. In some districts there are engineering difficulties of gradients up steep hills,—zig-zags being the remedy,—nor can I see the reason why tunnels are not used, as elsewhere. The hills are not composed of harder stone than in other countries. It is peculiar that the capital of the colony should have no railway from it to the northern districts, which are as important as the southern ones. Travellers have to take the steamer to Newcastle, a distance of seventy-five miles, and at holiday times the boats are utterly inadequate to convey the number of travellers, and when there are gales at sea, they are delayed; at one time last winter, for three days no mails could be delivered. The Government is now waking up to the importance of connecting the northern district with its capital, but it has been delayed by the squabbles respecting the route to be taken; the chief difficulty being to cross the Hawkesbury river, it has been decided to take the line to Waratah, a suburb of Newcastle, instead of Maitland or Singleton, which would have shortened the journey from the north considerably. Only first and second class fares are allowed. At holiday times, agricultural shows, and race meetings, excursions are allowed at a single fare; and at Christmas time, owing to this, Sydney is full of visitors who can stay two or three weeks.

Owing to the want of roads and water, the natural resources of the colony have not had the chance of being fairly opened up. Within the last two years great gold-fields have been opened up at Temora, Wilcannia, and Mount Browne. The two latter are at the extreme north-west end of the colony, and without any adequate road, so that many adventurers lost their lives for want of water.

The last season to the cattle-breeders was one of the worst ever known, through the small rainfall, and it is not until they have mustered their flocks for shearing that the losses can be ascertained. In the Dubbo district this month on one run that last year mustered 30,000 sheep, this season mustered only 5,000, and the same is experienced on other runs in the neighbourhood. In consequence, the prices of meat have advanced from 2d. to 6d. per lb. for good meat. The exportation of meat to England by the freezing process has been begun in earnest, but is only partially successful. Owing to the tropical nature of the country, cattle-breeders will never be able to compete with the Americans or with New Zealand.

The land question has for many years been a

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vexed one. Large areas of land have been granted as runs, the lessees of which have had to admit selectors who were willing to settle upon and cultivate the land. The latter would naturally look out for the best plots with water facilities. In time the squatters resorted to dummyism by getting elderly men brought to the district and introduced as selectors, who, for a small consideration, would give up their rights, and so shut out bonâ-fide settlers. Out Dubbo way this has reached to a notorious pitch, and it has come to a kind of battle in Parliament, the majority of the members of which may be termed as being in the squatting interest, and many have been the dodges of squatters and selectors.

The harbour of Sydney may be said to be one of the finest in the world; it may be termed an inland sea, deep enough for vessels of any burden; the outlet is two miles wide, and inside it consists of a vast number of bays. The direct distance from the Heads to Parramatta is 15 miles; but to travel along by the water's edge from the Heads and back on the the other side is a distance of 1,500 miles. Owing to its having been selected as the convict station of Britain in the beginning of this century, persons who emigrated as traders did not feel much love for its traditions. There was then no idea of its importance in the future. Lands were granted to persons on condition of their maintaing a certain number of servants or convicts, who frequently were alloted a plot of land to settle on; but in many cases they, when their time was up, preferred being out of the neighbourhood where they were known as "lags;" and twenty-eight years ago it was a common practice for these men to sell their plots for a bottle of rum. Many of the plots now under cultivation would realise 1,000*l*. The old parts of the town were never properly set out for the convenience of traffic; the water frontages were allowed to be enclosed by private traders, and in some cases access to a wharf was closed up so that people had to ascend a steep hill and down again to get to the next wharf, separated by a simple partition. This is the case at Miller's Point and Darling Harbour, which is a great shipping centre. Had the Government years ago have insisted on a road being carried round by the shores, or parallel with the wharfs, much fatigue would have been saved pedestrians and horses. Much has been done to deepen and improve the harbour to admit large steamers to its quays; but a great drawback is in the amount of sewage that is allowed to be poured into it, poisoning the air in warm weather, instead of erecting engine-shafts to throw the sewage into main sewers at various heights, and thence far into the country, where it could be utilised for the earth. The authorities prefer the costly system of dredging it up into punts, which are taken out to sea and the contents discharged into it. Many schemes have been devised for the interception of the sewage, and getting it conveyed to the sea, but none have yet come to maturity; whilst fresh sewers are being made to discharge into the numerous bays. During the spring and summer an immense number of excursions take place.

Owing to the suburbs having extended very much, the authorities had to allow the inhabitants to obtain their water from the reservoirs at Botany: these were thought sufficient for any number of people, but owing to the droughts the supply became so low that, during the last two seasons, the authorities have had to issue orders for the factories and bath-rooms to discontinue having any. The streets are now watered with salt water, which is found to be better, as it keeps damper much longer than the fresh water. While the rest of the world has been in a depressed state, New South Wales has been prospering to an unprecedented extent, and Sydney has increased its population rapidly; in consequence, the building trades have been very active; materials and labour increased in price, so that it is difficult sometimes for an architect to obtain a tender for work. Last month middling carpenters easily obtained an advance from 10s. to 11s. for eight hours per day; while you will be able to surmise the state of the building and other trades by a perusal of the *Sydney Morning Herald* to this date, which will rather underrate than otherwise the rates of wages paid. Draughtsmen obtain about double the pay they do in England, and work but thirty-nine hours a week. Strikes are now taking place, but, as a rule, may be said to be soon over, the masters giving in and obtaining higher prices for their work. One of these is worth mentioning. Messrs. Hudson Brothers, who are large railway-carriage makers, not being able to obtain sufficient men, brought from England a number of blacksmiths and strikers with their families, at an expense of 800*l*. They guaranteed them 3*l*. per week for two years, which is about double the amount they would earn in England. After working a few weeks they struck, alleging that by the piecework they could not earn 3*l*. a week. They were summoned at Parramatta and told they were liable to imprisonment if they neglected their contract, and very unwillingly they returned. It was stated that local workmen had induced them to strike. These are the class that should be made an example of. A painters' strike is on the tapis.

In consequence of building being costly, rents are very high, 18s. a week being paid for a labourer's cottage of three small rooms, and 25s. for a six-roomed house, including attic and kitchen. The consequence is, in spite of high wages, the majority of these tenements have lodgers. The taxes are heavy, while out in the country there are none, except upon dogs, and, considering these animals are most useful to settlers, it might well be done away with.

The Town-hall scandal has had its side for the last two years. A brief account of it is this. A banqueting-hall was some time previously begun to be built in the rear of the town-hall. When the walls were up a few feet above the ground, the works were stopped. A drain was subsequently made from the town-hall alongside part of the new work, and it was then discovered that the foundations had been built anyhow. This led to a search of the rest of the foundations, which were found of the same character. The city architect, Mr. Beath, had never appointed any clerk of works, and ultimately resigned his appointment, returning a sum of 1,500*l*. as the consequence of the oversight; and there is reason to believe a similar defect exists in the plaster-work, which was so scamped that some of the ceilings partly dropped, and an examination of the rest proved it to be so bad that those using the rooms are in fear of a like visitation.

At the end of last session a new Licensing Act was hocussed through Parliament, much in the same style that the Epping Forest Preservation Act was passed in London, when members at the end of a session were anxious to get away. Up crops an important measure, requiring a deal of debate, which is allowed to be forced through without discussion, and afterwards the Corporation of London, by means of an arbitrator, obtain ground-rents at a fictitious price, under pretence of its being for the purpose of paying the costs and preserving the forest, and at the same time levying a duty upon corn brought into London. The new Licensing Bill out here proposed to make publicans pay a licence of 70*l*. a year for first-class hotels, 50*l*. for second-class, and 30*l*. for third-class, the latter having been the old amount. This was rejected, and an Act closing them on Sundays, and those that had less than eleven rooms of 1,200 cubic feet each, were to be at once enlarged, or the licence forfeited. The Act came into force on the 1st of January, and the police were very active in hunting up people who sold drink on Sundays. Owing to the state of the building trade, it was found impossible to obtain sufficient men all at once, and to hear the magistrates cautioning publicans who were summoned for not having their houses completed in time, one would have thought that some disaster was going to overtake the colony. By the Act, a publican who was fined less than 5*l*. could not appeal to a higher court. The magistrates said that it rested with the publicans to prove that people were travellers, and not the police. The former is commonly indoors, while the latter in course of time know most persons residing on his beat. Three weeks ago seven publicans appealed against the decisions of the magistrates: they produced witnesses to prove that the men served were *bonâ-fide* travellers, and Judge Forbes reversed six out of the seven decisions; yet do the magistrates still keep on their vicious system of fining publicans on the testimony of the police. During the last week an inspector's zeal led him to make application to the magistrate to cause the licence of an hotel to be forfeited, because the licensee was not living on the place, through its having been pulled down as a dilapidated building, and set back on a line with other houses. The Corporation had ordered it to be rebuilt, yet the inspector, although asked by the magistrates to withdraw the case, refused to do so, and then the magistrates rejected the application. The result of this severe dealing will cause a reaction, and many of the members of the Legislature will lose their seats at the next triennial election; for many publicans are afraid to admit travellers, and say they will sooner take the chance of being summoned for not doing so. This is a curious state of things. The Act has done good in Sydney in stopping habitual drunkards.

But it is in the country districts that the Act has proved a curse. In many thinly-populated localities there have been log houses built for public-houses when the districts were being opened up. The rooms were low, and the bedrooms small, to accommodate one traveller each. Owing to the introduction of railways, the road traffic has diminished, so that with the imposition of a 30*l*. licence a great many public-houses have been shut up, and travelling prohibited, so far as obtaining food for man and beast. To my own knowledge, the route from Bendemeer to Burrragong, a distance of sixty-two miles, has not now a public-house along it, where previously travellers could use the route. A well-advised Premier would have insisted on the houses being enlarged at the expense of the Government, if the owners were too poor to give the legislative accommodation, which was never required in the country, through the small amount of business done.

The Botanic Gardens are the most beautiful in the colonies; they skirt that portion of the harbour which the shipping passes as it goes to the quays; but a needless act of officialism is practised. The great majority of visitors use the path skirting the water leading to the Macquarie Chair in the domain. A fence divides the two, and there is a gate at the end of the gardens, yet, strange to say, it is not allowed to be commonly passed through by the public, who have to turn up steep rising ground to a lodge for 100 yards; it is rarely that the gate is opened. The native flowers are abundant and luxurious.

The connexion of the footpaths with the streets in the city is of a very defective character; there are iron plates about a third of the width of the pavement; while in the suburbs, where it is not so much required, the remedy has been adopted.

Some of the local beers are of an inferior manufacture, very little malt or hops being used. It is proposed for the good of the colonists to introduce a measure that will quickly rid the colonials of drinking bad beer, by causing each member of the Legislature when elected to undertake to drink half a pint of beer at each sitting, under a fine of 10s. per day to be paid to an official; each brewer in the town and colony to have a week's testing of their beers. When this is done a wholesome reaction is anticipated, as members will become so frightened at the idea of drinking adulterated liquors that, for their physical and pockets' sakes, they will soon set about this reform without any debates.

A feature of the neighbourhood round about Sydney is the land sales, which take place daily, and which are somewhat expensively got up by the auctioneers. Where townships are formed the neighbourhood is bought by speculators, who employ auctioneers to sell the land. These, in their turn, go to surveyors to make plans of the land on large sheets, with embellished borders and gorgeous colours to the plots of land, on sheets up to 12 ft. long. The auctioneers advertise the charming qualities of the district, with the certainty of its fetching double the price in a few years, and giving free passes by rail, tram, or road to those attending the sales; and, if the distance is great, a free lunch is provided; and many are the excursions indulged in by non-intending purchasers. In the surveyors' offices the spare time of the clerks is employed in getting up borders for auctioneers' plans.

Emigrants arrive here from England every month. Upon landing they are mostly met at the hiring-room, but few present themselves there. Two months ago, out of a shipment of 400 emigrants, only three young women presented themselves as household servants, for whom no fewer than 109 ladies applied. When the emigrants are landed with their luggage, they are met by draymen, who charge high prices,—which ought to be stopped by printed notices at the landing-places giving the legal charges per cwt. for conveyance of

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their luggage,—at a time when every shilling is of consequence.

Taxation in the towns is heavy, but in the country no taxes are levied, with the exception of a dog-tax, which, to me, is strange, as in pastoral districts they are more useful than men.

I trust this lengthened communication may not prove unwelcome to your readers.

Sept., 1882. J. B. WATTS.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

5,107. W. T. Goolden & C. F. Casella, London. Apparatus for indicating excessive variations of temperature in buildings, &c. Oct. 27, 1882.

5,115. T. H. Collins, Winchester. Manhole doors for passages leading to sewers, &c. Oct. 27, 1882.

5,116. J. Wetter, London. Fire-escapes. (Com. by C. H. Höhmann, Cassel, Germany.) Oct. 27, 1882.

5,124. A. W. L. Reddie, London. Alarm-bells for doors, &c. (Com. by F. J. Masseron, Paris.) Oct. 27, 1882.

5,125. A. J. Boult, London. Door-checks. (Com. by the Elliott Pneumatic Door Check Co., Boston, U.S.A.) Oct. 27, 1882.

5,132. S. Williams, Birmingham. Kilns for burning lime and bricks, &c. Oct. 27, 1882.

5,165. A. M. Clark, London. Gas cooking-stoves. (Com. by W. W. Goodwin, Philadelphia, U.S.A.) (Com. Spec.) Oct. 30, 1882.

5,197. W. R. Lake, London. Apparatus for flushing water-closets. (Com. by J. Cooper, Boston, U.S.A.) (Com. Spec.) Oct. 31, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named :—

Oct. 31, 1882.

3,009. W. S. Morton, Edinburgh. Domestic fireplaces, &c. June 26, 1882.

3,251. A. M. Clark, London. Ovens. (Com. by J. E. J. L. Mounié, Paris.) July 8, 1882.

Nov. 3, 1882.

3,095. H. Conolly and A. E. Hubert, London. Overflows of valve closets. June 30, 1882.

3,096. H. Conolly, London. Water waste preventers. June 30, 1882.

3,110. J. Brownrigg, Windermere. Door furniture, &c. July 1, 1882.

3,459. A. Dix and J. H. Dix, Rock Ferry. Apparatus for checking the cords of blinds, &c. July 20, 1882.

4,783. G. Hurdle, Southampton. Opening and closing of window-sashes, &c. Oct. 7, 1882.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending November 4, 1882.

1,109. T. W. Helliwell, Brighouse. Securing on to buildings sheets of zinc, metal, &c. March 7, 1882. Price 4d.

The edge of each sheet is turned up at right angles, and when placed in position there is a small space between two of these adjacent flanges, over which is placed a cap or hollow bar, which is secured to the framing by screws passing between the two flanges.

1,351. J. Rettie, London. Binding for scaffolding. March 20, 1882. Price 4d.

Chain is used instead of rope, and on one end is a hook which engages in one of the links. Part of the chain is enclosed in a small length of tubing, and the wedge is driven in between this tubing and the poles to tighten the chain.

1,357. J. Thom, Wolverhampton. Securing door-knobs to spindles. March 21, 1882. Price 2d.

The collar has a concentric plug projecting outwards, on which is cut a thread in the opposite direction to that inside the collar; this plug enters a hole in the knob. The collar is screwed on the spindle and the knob passed over. The collar is then screwed home, when the plug screws into the knob and secures it. (*Pro. Pro.*)

1,375. J. H. Black, London. Locks. March 21, 1882. Price 2d.

The locking mechanism is contained in the knob, and consists of levers which fall into slots in the rose, and prevent the knob from turning. (*Pro. Pro.*)

1,382. C. Fisher, Loughborough. Apparatus for drawing off water, &c. March 22, 1882. Price 2d.

The two legs of the syphon are connected by a flexible tube. The short leg is suspended from a lever, and when it is dropped into the water so as to place the flexible bend below the level of the same, the syphonic action is established. This is specially applicable to water-closet cisterns. (*Pro. Pro.*)

1,397. J. F. Grimmo, Leyton. Flower-pot stands for windows, &c. March 22, 1882. Price 4d.

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

Beneath the grating on which the flower-pots stand is a sheet metal tray depressed in the centre, which catches the water and passes it into a vessel placed beneath a hole in the centre.

1,410. U. Scott, London. Means of ingress and egress to theatres, &c., in case of fire. March 23, 1882. Price 4d.

Balconies are made to each floor, connected together by staircases outside. The canopies over the entrances to the theatre are hinged to the lower balcony, and formed with steps on their upper surfaces, and are capable of being lowered down until their outer edges rest on the ground. A fire-proof shaft is made to each house, &c., with a metal ladder inside. Doors made of non-inflammable material communicate from each floor with the shaft.

1,434. E. G. Banner, London. Sewers. March 24, 1882. Price 6d.

The sewers are divided into sections by traps, and to ventilate each section air is admitted at one end through lamp-posts or other shafts while the foul air and gases are drawn out at the other end through shafts fitted with exhausting cowls. These latter shafts are made of a height above that of the surrounding buildings.

1,435. B. Finch, London. Chimney-flues. March 25, 1882. Price 2d.

To prevent the accumulation of soot the flues are built of pottery-ware glazed inside. (*Pro. Pro.*)

1,498. W. R. Lake, London. Metallic shingles for roofing purposes. (Com. by C. Comstock, New Canaan, U.S.A.) March 28, 1882. Price 4d.

This is an improvement on Patent No. 3,491 of 1878 in making a projection or hook on each side of the point of the shingle, and in springing up the metal at the obtuse corners of the same so that the hooks of the overlapping shingle will pass under the adjoining edges of the two underlying shingles and hold the point in place.

1,512. T. Jones, Sedgley. Ladders. March 29, 1882. Price 2d.

These have tubular metal rungs, the ends of which are opened out when they have been placed in the side bars and plugs of wood are driven in from the outside. (*Pro. Pro.*)

ALLEGED LIBEL ON A BUILDER.

AT the Westminster Police Court, on Monday, Henry Ashford, builder's clerk, was charged on a warrant before Mr. D'Eyncourt with unlawfully and maliciously publishing a certain defamatory libel of and concerning Mr. Edmund W. Bradwell, builder and decorator, of 112, Great Portland-street, knowing the same to be false. Mr. J. P. Grain appeared for the prosecution; the defendant was not represented.

Mr. Grain said the prosecutor obtained the contract to rebuild the new St. James's Theatre. Lord Kilmorey, who had employed him, afterwards disputed a portion of his bill, and pleaded a counter-claim of 2,000*l.*, alleging that the work was not performed within the specified time. The matter was referred by Lord Coleridge to Mr. E. M. Dowdeswell, Q.C., one of the official referees of the High Court of Justice, and he gave his award in February last in favour of Mr. Bradwell. The defendant was, up till September last, in the employment of Mr. Bradwell, and, on being discharged, he wrote a letter, the alleged libel, to the official referee, making very grave charges of fraud and falsification of books against his late employer. At the trial the books were examined by both sides. In the letter to Mr. Dowdeswell the defendant alleged that upon Mr. Verity (Lord Kilmorey's surveyor) insisting on seeing Mr. Bradwell's books for the purpose of arriving at the prime cost of the work done at the theatre, the prosecutor, with the defendant's assistance, altered them on the evenings between August 6th and 30th, 1880, ten months after they had been properly made up, Mr. Bradwell's idea being to obtain a further 12 to 15 per cent. profit from Lord Kilmorey.

Mr. D'Eyncourt remarked that the defendant made himself out to be a party to the roguery.

Mr. Grain said that was so. The defendant also stated that the prosecutor asked him, if called as a witness at the trial, to swear that his pencil entries in the books had been carefully inked in by another clerk. The defendant further alleged that Mr. Bradwell had wilfully countenanced a mistake of 80*l.* in his own favour; that various credits were not given; and that, in fact, a fictitious statement of accounts had been concocted. The defendant also averred that he absented himself from the trial to avoid committing perjury.

The defendant said the charges he had made were true in every respect; his defence would be a plea of justification.

After some discussion the case was adjourned, Mr. D'Eyncourt agreeing to accept bail for the defendant, two sureties in 40*l.* each, in addition to his personal security.

A Primitive Methodist Chapel and School are about to be built in Queen's-road, Bootle, Liverpool. The plans have been prepared by Mr. S. Hurst, of the firm of Maxwell, Tuke, & Hurst, architects, Southport, and were selected by the committee from amongst several designs submitted in a limited competition.

LETTING A HOUSE WITHOUT GIVING NOTICE.

JOSEPH ELLIS, of Mitcham, was summoned before the Croydon bench, on October 28th, by R. M. Chart, Surveyor to the Croydon Rural Sanitary Authority, for letting a house, No. 6, Tramway-terrace, Mitcham, without having given fourteen da y' previous notice to the authority. After hearing the evidence, the magistrates convicted the defendant, who was fined 40s. and the costs.

Frederick Titcomb, of Merton, was summoned before Mr. Paget, at Wandsworth, on November 1st, by Mr. R. M. Chart, Surveyor to the Croydon Rural Sanitary Authority, for neglecting to give notice specifying the date of commencing houses on the Merton Abbey Estate. The defendant relied on a letter written by the architect to the surveyor, informing him, in general terms, that the houses would shortly be commenced. This, however, was held not to be sufficient, and the defendant was fined 10s. and the costs.

These are the first convictions under the by-laws recently obtained by this Authority.

METROPOLITAN IMPROVEMENTS AND ARTISANS' DWELLINGS.

SPENCER *v.* METROPOLITAN BOARD OF WORKS.

IN this case (which came before Mr. Justice Chitty on Monday last) the plaintiff moved for an injunction to restrain the Metropolitan Board of Works from proceeding to take down sixty-three houses in the district of St. Giles-in-the-Fields, and which were owned by the plaintiff, who was also the freeholder.

It appeared that the Metropolitan Board of Works, under their powers given in the Metropolitan Streets Improvement Act of 1877, proposed to take the houses in question for the purposes of the improvement known as the Piccadilly to New Oxford-street Improvement Scheme. At the date of the Act in question almost the whole of the houses were occupied by the labouring classes as tenants or lodgers. The Metropolitan Board served the usual notice to treat on the plaintiff about March 12, and the plaintiff's solicitor then sent in a claim for compensation to the Board, accompanied by a notice that the claim was delivered without prejudice to all questions in regard to the right of the Board to exercise their compulsory powers without having complied with the 33rd section of the Act referred to. This section provided, amongst other things, that the Board shall not, without the consent of one of her Majesty's principal Secretaries of State, take for the purposes of the Act fifteen houses or more occupied at the time of the passing of the Act, either wholly or partially, by persons belonging to the labouring classes as tenants or lodgers; the Board shall prove to the satisfaction of such Secretary of State that sufficient accommodation in suitable dwellings has been provided elsewhere upon certain lands specified in the Act or other lands approved by the Secretary of State. The contention of the plaintiff was that as the Board had neither the consent of the Secretary of State, nor having otherwise complied with the requirements of the section, was not in a position to take any valid steps towards obtaining the houses; and that the words "take for the purposes of the Act" must bear the ordinary meaning.

The defendants, on the other hand, read the words of the section as "taking possession of." The object of the Board was in this instance to destroy property, while the Act of Parliament was distinct on the question that they were also to construct houses for the poor whom they turned out of their homes. It was expected that in time the labouring classes turned out of their houses would be provided with suitable dwellings, but if the Board were called upon to erect these, a great deal of delay would take place, and as the Board had only a limited time to construct the new street, their powers would be exhausted, and the works would not go on. The street about to be formed would begin at St. Martin's-place, and end at Oxford-street, so that there would be a direct line of communication to Hampstead.

His Lordship said that this was a question of considerable importance to the Board and the owner of the houses, as also the labouring classes, for whose protection certain clauses were introduced into the Metropolitan Streets Improvement Act of 1877. It was stated that in this particular district there were over 10,000 of the labouring classes dwelling within the area. He considered this question of much importance, as the particular statutory period was running out, and he thought it would be much better that he should at once express his opinion rather than order the motion to stand over till the trial of the action, when it would be more amply discussed. There were certain questions not in dispute between the parties, and amongst these it was admitted that the plaintiff was served with a notice to treat, and that the Board was about to summon a jury to fix the amount of compensation. It was not denied that the Board proposed to take down more than fifteen houses at one time, and that the consent of the Secretary of State had not been obtained by the Board to justify them in the course

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they proposed to adopt. It had been urged that the defendants could not take the property or lands when they had not complied with the clauses of the statute and obtained the consent of the Secretary of State, and he had come to the conclusion that the construction put upon the 33rd clause of the Act by the plaintiff was the correct one. The plaintiff was, therefore, entitled to the injunction asked.

STAFFORD WATER SUPPLY.

SIR,—In the *Builder* of the 4th inst. I observe a statement on this subject, which, I think, deserves to be noted. It appears that a proposal has been entertained to apply for an Act of Parliament to enable the Corporation to obtain a new supply from Cannock Chase, but that this project is deferred for further consideration, and meanwhile the present supply is to be analysed, "in order to see what improvement had taken place since the adoption of the tub system," and the meeting was adjourned for a month.

If I read the report correctly, it appears that the Town Council are looking for or hoping for an improvement in the quality of the drinking-water supplied to the town by the adoption of the excreta tub system! Is it possible that a corporation can be found to make an admission that they hope the new system of collecting excreta will show an improvement in their water-supply? If so, inferentially, the inhabitants of the county town are not to be congratulated either as to the quality of their water, or as to the public spirit of their Corporation, who must know that, if the suggested analysis shows no improvement arising from the tub system, the people must go on for at least another three years as they are, as the adjourned consideration of the all-important question of water-supply puts it out of the power of the Corporation to apply for powers during the coming session.

I have not the slightest personal interest in this question only as a constant reader of yours and as a

SANITARY ENGINEER, M. Inst. C.E.

SEWER VENTILATION.

SIR,—In your issue of October 14, p. 507, a "Poor Buffer" complains that at Littlehampton the manholes have been stopped up, and asks where the sewer vapours and gases go now? In the issue of Oct. 21, p. 540, "Another Poor Buffer" laments, and states that he is at a loss to understand (and well he might) in what lies the science of an ordinary sewerage system. In the issue of October 28, W. P. Buchan enters the list, and advises one of the complainants to take the beam out of the eyes of his own drains before he complains. In the issue of November 4th, complainant replies to W. P. Buchan that he was not aware that drains and pipes were gifted with visual organs (perhaps the discovery that they have is a part of the hidden science). May I, sir, be permitted to offer, briefly, a few remarks on the foregoing letters. As regards the first "Poor Buffer's" complaint, it is manifest the sewer emanations will find their way out at the ventilating-pipes, and, as a consequence, more or less, according to the favourable or otherwise condition of the atmosphere, poison the air contiguous to these openings, and probably endanger the health of those who have to breath it.

As regards the complaints of "Another Poor Buffer," I am bound to confess I am equally puzzled as himself to know where lies the science of constructing an ordinary sewerage system. The great evil is, according to my thinking, that the sanitary authorities should have dealt with the conducting away of sewage, after the manner of our professional architects and civil engineers in their designs for supplying a town with water and gas to certain fixed spots, to be turned off and on by taps. In such cases the fluid and gas are under pressure, and render entire pipes and sealed joints absolutely necessary.

Now, the removal of sewage seems to me to require quite the opposite consideration. In this case, the pipes are never full, and never under pressure (ordinarily). Special cases may require special provision, and the greater the provision for admitting air to them, the more salutary will be the system, and the easier the flow.

It is just as reasonable to expect thunder without clouds as it is to expect to be free from the danger of the deadly sewer gases while we persist in having bottled-up pipes and sealed joints.

Wherever circumstances would allow it, I would recommend that all house-drains should be pierced all along the tops, so that they might be supplied with air and rain-water through the "filling" as a medium, a layer of shingle being placed immediately over the pipe.

REFORMER.

CHURCH AND RAILWAY ROAD.

SIR,—It is wished to build a church in a poor neighbourhood by the side of an approach-road to a bridge over a railway, and to enter the church at the highest point of the road, so as to give a space underneath the floor of the church for a large hall and rooms for mission work and parish purposes, without which it is believed the church would have but comparatively few worshippers.

Can any of your readers tell me of such a church having been built in the metropolis, and if so, where? It is wished that the church should be of the most durable character in every respect, so as to minimise as much as possible the yearly cost of maintenance. Perhaps, also, some of your readers would give me the benefit of their experience as to the materials to be used, especially for the roof.

C. C.

SALE OF A BUILDING ESTATE AT WIMBLEDON.

A FEW days ago Messrs. Baker & Sons offered for sale, at the Auction Mart, an extensive freehold building estate at Wimbledon, containing altogether an area of thirty-seven acres. The estate was described as being within three minutes' walk of the Wimbledon Railway-station, and no portion of it more than ten minutes from any station. It was stated that the surrounding roads were all sewered, and water-mains run through the whole of the property. There was a very numerous attendance of capitalists and builders present, the sale-room being much crowded. The property was submitted in four lots, the first lot offered being a block of building land, containing 6¼ acres, having a frontage of 500 ft. to the Dundonald-road, and 594 ft. to a proposed new road from the Dundonald-road to the Kingston-road. The biddings commenced at 2,000*l.*, and the property was sold for 3,800*l.* The next lot contained 7 acres, possessing frontages of 1,052ft. in length. The particulars stated that it included a detached residence, known as Henfield Villa, with stabling, garden, and a paddock of 2 acres in extent, which was let for an unexpired term of three years, at a rental of 63*l.* per annum. It was sold for 4,500*l.* Two adjoining lots, one containing 11¼ acres, and the other 11 acres, were sold at the rate of 560*l.* per acre. The total amount realised by the sale was 21,000*l.*, representing an average of about 570*l.* per acre.

NEW RAILWAYS.

Denton and Dukinfield.—Major Marindin, one of the inspectors of the Railway Department of the Board of Trade, has inspected the new Denton and Dukinfield Railway, and certified that it has been completed to his satisfaction. It is a double line of railway between Denton and Dukinfield, in length about 1 mile 37 chains. For its length the works have been exceptionally heavy, and comprise a covered way under Guide-lane, in length about 170 yards, and another under the Manchester, Sheffield, and Lincolnshire Railway, about 140 yards in length, this work having been carried out without any disturbance of the large daily traffic of that company. From this covered way the line is continued upon an embankment between the river Tame and the Manchester, Sheffield, and Lincolnshire Railway, until it joins the line near Dukinfield Station. The object of the London and North-Western Railway Company in constructing the line is to avoid running through Guide Bridge Station. The works were commenced about April last year, and have been carried out from the plans of Mr. Francis Stevenson, engineer in chief to the company. Mr. Walter Scott, of Newcastle, has been the contractor.

Newbury and Lambourne.—The project for the construction of a railway between Newbury and Lambourne, to meet the requirements of the important agricultural district lying along the Lambourne Valley, has been revived. The present scheme has been worked out on an amended plan, avoiding some of the defects which appeared in the Bill lately rejected by the House of Lords Committee.

PROVINCIAL NEWS.

Manchester.—The Mayor of Manchester has formally opened Upper Campfield Market, Deansgate, for the sale of miscellaneous goods. The stalls for this class of goods which for a number of years have been located at Shude-hill have been abolished, and new stalls have been erected in the market by the corporation. The building was erected from designs by Messrs. Mangnall & Littlewoods, architects, Manchester, its total length being 187 ft. and 130 ft. wide, covering an area of 2,700 square yards. There are entrances in Liverpool-road, Tonman-street, and Deansgate, the latter being through the centre of the new block of buildings erected by the Manchester Corporation for a free library. The market is principally of iron construction, the sides being enclosed with wood framing, glazed with rough plate-glass. Internally the building is divided into three bays, the centre one or main avenue being 50 ft. in width between the columns which support wrought-iron elliptical lattice principals and iron purlins.

North Shields.—A new banking establishment is being erected here for Messrs. Hodgkin, Barnett, Pease, Spence, & Co. It is being reared on the site of the old "Commercial Hotel," and from the designs of Mr. F. R. N. Haswell, architect. The design is Classic in style, and the façade will be entirely of polished and moulded stone. The front consists of a slightly-recessed central part with two wings, divided into five bays, each separated by pilasters with bases and carved Corinthian capitals, the lower or ground floor stage being built in rusticated ashlar, the whole being surmounted by an elaborate cornice with carved consoles. The plinth is of grey Dalbeattie granite, and the entrance-door to the banking-room has deeply-recessed and moulded jambs with segmental arched head, the inner moulding being of polished red granite. The private door to the residence is at the opposite end of the building to the public entrance. Three large windows occupy the space between the doors, and give light to banking-rooms. On the first floor are five windows with moulded architraves and pediments over them, with carved ornaments in the tympana, and over these five smaller windows for the second-floor rooms. The banking-room will be a fine apartment, 36 ft. by 26 ft. 6 in., extending from front to back, and lighted from front and back. The walls are to be panelled with mahogany. The height of this room is 16 ft. The manager's residence consists, on the first floor, of drawing, dining, and breakfast rooms, kitchen, scullery, and several pantries and store-rooms; on the second floor, of five bed-rooms, bath-room, and other conveniences; and on the third or attic-floor, two sleeping attics, a large attic with space enough for a gymnasium, and a cistern-room. The contract for the building has been entrusted to Mr. George F. Shotton, of North Shields.

North Ormesby.—The Roman Catholic Bishop of Middlesbrough has formally approved the plans of the new Roman Catholic Cemetery and Chapel at North Ormesby, which have been prepared by Mr. McCarr, architect, Queen's square. The site consists of two acres of ground adjoining the present cemetery on Ormesby-road. The gate-house will occupy a central position in the site, and will consist of sexton's house and offices, with connecting central gateway. The chapel will be in the middle of the ground, and will be in the Early Decorated Gothic, style freely treated. It will comprise entrance-porch, and main building consisting of nave and sanctuary. The buildings will be of brick with stone dressings.

Stormy Weather in several districts is again reported. In parts of Yorkshire there was a heavy gale, and one of the pinnacles of the spire of Goole Church was blown down, and fell through the roof into the chancel, doing considerable damage. A violent thunderstorm passed over Kendal and the Lake district, accompanied by showers of hail. The lightning wrecked a cottage at Longpool, destroyed some telegraphic wires, struck the gable end of one house, and did rather serious damage in another.

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CHURCH-BUILDING NEWS.

Pelynt.—Pelynt Church, Cornwall, has been re-opened, after restoration. Some three years since it was found that the north aisle and roof were in a most dilapidated condition,—in fact, almost falling in,—and steps were taken by the then vicar, the Rev. W. Martin, to procure means sufficient to enable him to renovate the sacred edifice. This resulted in the renovation of this part of the building and the tower. This completed the work of restoration for a time, but subscriptions continued to come in, and it was resolved to go still further with the work. Efforts were at once made by the present vicar, the Rev. John B. Kitson. Mr. J. Piers St. Aubyn's services as architect were called into requisition, and the result of the action of the committee is that the whole of the south wall, together with the Trelawny aisle, porch, and vestry, have been entirely rebuilt. Messrs. Slade, Sons, & Lean were the builders, and the cost up to the present has been about 1,350*l.*

Ashill.—The parish Church of St. Mary Ashill, near Ilminster, Somerset, has been re-opened, after restoration at a cost of 700*l.* The church is an ancient building, exhibiting Norman, Decorated, Perpendicular, and Early English styles of architecture. It had fallen into decay, and its restoration became imperative. The beautiful Norman arch in the chancel has been preserved; the roof has been restored, and the woodwork is now open to view; the walls have been re-plastered, a new moulded arch of Ham Hill stone has been built in the western nave, and a new window has been placed in the north wall. The work has been carried out by Mr. H. J. Spiller, of Taunton, under the direction of Mr. J. D. Sedding, architect, London. The building contains several monuments of the Speke family, and two monumental effigies, the history of which is unknown; but concerning one of them, tradition preserves a curious legend. The wife of a yeoman residing in the parish, and in close proximity to the church, some time during the Middle Ages (parochial record does not state the year) was delivered of seven at a birth. The progeny being too numerous for the husband to maintain until they reached years of maturity, he carried the whole of them away from his home in an apron, with the intention of drowning them in a stream which ran close by. While he was passing the church on the way to carry out his unchristian intention, he was met by the lady to whom the manor belonged, who at once questioned him as to the contents of his bundle. He replied, "Only a few puppies, which I am about to drown." Not satisfied with the man's statement, and his strange and excited demeanour arousing her suspicions that something was wrong, she examined the contents of the apron, and found that there were seven children. She rebuked him for his diabolical design, and at once relieved him of his charge. Taking the children under her own care, she brought them up to manhood's estate, and made one of them a prebendary of the Church, and in honour of him, it is said, one of the effigies has been raised. As giving some slight corroboration of the truth of the legend, it may be mentioned that at the present time Ashill parish is a prebend of Wells. The manor-house is still in existence where the children are stated to have been reared.

Cannock (Staffordshire).—The parish church was re-opened by the Bishop of Lichfield on the 18th ult., after enlargement under the direction of Mr. Nicholas Joyce, architect, Stafford. The church, which is old, has a nave, north and south aisles, a chancel, and a western tower. The nave underwent considerable alteration at the time when the south aisle was rebuilt, in 1753. Until recently the walls of the chancel, erected about the year 1300, remained nearly in their original condition, but a low-pitched hipped roof had taken the place of the old gabled roof. In order to effect the enlargement, the removal of the old chancel was unfortunately inevitable. The style of architecture of this part of the church has suggested the character of the whole of the new work, which includes the extension of the nave and aisles two bays in an easterly direction, and the building of a new chancel with a north aisle for organ-chamber and vestry. About 250 additional sittings have been obtained. All the new woodwork is of pitch-pine, oil-stained. The floor of the chancel is laid with tiles, from the Campbell Tile Company's Works at Stoke-upon-Trent. The glazing, in imitation of some old quarry glazing preserved in an old fourteenth-century window that had been blocked up, has been well executed by Mr. Evans, of Smethwick, who has also put in a stained-glass memorial window at the cost of Mr. Ewan Christian. The ironwork is made by Messrs. Brawn & Sons, of Birmingham, and the general contractor was Mr. Thos. Williams, of London. The cost has been about 2,700*l.*

Plymouth.—The work of embellishing the Church of St. Peter, Plymouth, recently erected from the designs of Mr. G. R. Fellowes Prynne, is being proceeded with. Massive double stalls in oak are now in course of construction, and are nearly complete. The new chancel-screen will be a very notable feature. It will stretch right across the wide expanse of nave from arcade to arcade. The whole of the upper part is of elaborate iron grill-work, by Messrs. Ellis & Rice, of Gray's-inn-road, London. The lower parts are of polished alabaster, richly moulded and carved with Early English foliage. This alabaster work is being executed by Mr. Harry Hems, of Exeter, who has also a parclose screen for the south side in hand. This is in Bath stone, with mullions of red Corsehill. All the work is being erected from the designs and full-sized details of Mr. Fellowes Prynne, the architect. Unfortunately, differences have arisen as to the settlement of accounts for the erection of the church. It seems that a builder of the name of Finch commenced the work, his tender having been accepted and a contract entered into; but circumstances early arose resulting in Mr. Finch being paid a certain sum, and in the work being placed in the hands of Mr. Alfred Gay, the clerk of works, to build. In the settlement, Mr. Gay and the architect failed to agree, and the matter got into the Court of Queen's Bench, and it was referred to arbitration. Mr. J. Edmeston, F.R.I.B.A., the arbitrator, held his first sitting in the case on the 17th ult., at the rooms of the Royal Institute of British Architects.

Birkenhead.—The parish church of St. Mary, Birkenhead, was reopened on Sunday last after alteration and renovation, the intention having been to restore the church as far as possible to the form originally intended by the architect, the late Mr. Rickman, and at the same time to increase the comfort of the congregation. Before these works were undertaken, there were three large galleries occupying the whole of the north and south transepts and the west end of the church. There was no centre aisle, and all view of the communion-table was blocked up by the lofty old-fashioned "three-decker" arrangement in the centre of the church. The church, as originally designed by the architect, had no galleries in the transepts, and these were subsequently added in consequence of the rapid increase of the parish. The following is a brief description of the most important alterations that have been made:—The height of the church has been increased by lowering the floor 15 in., it being found impracticable to alter the height of the ceiling; the whole of the galleries in the north and south transepts have been removed, the space occupied by the staircases and vestibules being added to the area of the church. The front of the western gallery has been set back 2 ft. The organ has been removed to a new organ-chamber built on the north side of the chancel, and the seats entirely re-arranged. All the pews have been reconstructed. A centre aisle has been formed, and the pulpit re-erected at the north-east corner of the chancel. The chancel has been raised 18 in. above the floor of the church, with stalls for the clergy and choir. Vestries for clergy and choir have been built on the south side of the chancel, and on the north side an organ-chamber, with heating-vault underneath. The lighting is done partly by four of Siemens's regenerative gas-burners. The passages and aisles are laid with wood blocks, the chancel and baptistery (late vestry) being laid with encaustic tiles, and the apse with mosaic pavement. The windows in the apse and the baptistery are filled with stained glass of an ornamental character. The main contract for the alterations has been carried out by Messrs. E. Legge, Son, & Co., of Birkenhead; the tiling and mosaic work by Mr. Leadley Brown, of Liverpool; the stained glass by Messrs. Campbell, Smith, & Campbell, of London; the ornamental glass by Messrs. Forrest & Son, of Liverpool; the whole of the works having been carried out under the superintendence of Messrs. Aldridge & Deacon, architects, Liverpool.

DISSENTING CHURCH-BUILDING NEWS.

Felling.—The Wesleyan chapel at Felling, after having been closed for a considerable period, was opened for service on the 1st inst. The chapel and schools may practically be said to have been reconstructed, rendering them more adapted to present requirements. The works have been carried out from the designs and under the superintendence of Mr. J. J. Lish, architect, Newcastle-on-Tyne, Mr. Brown, of Felling, being the general contractor, and Mr. Atkinson, Newcastle, contractor for the stained-glass work.

Runcorn.—St. John's Presbyterian Chapel, Runcorn, was reopened on the 1st inst., after internal decoration by Mr. Greyson, of High-street. A heating apparatus has recently superseded the stove system of warming. The apparatus is Mr. W. E. Lea's patent.

SCHOOL BOARD SCHOOLS.

Upton Noble.—A new Board School has been erected at Upton Noble, Somerset, from the designs of Mr. R. J. Withers, architect, London. It has been erected by Mr. J. Vallis, of Frome. It is built of native stone, with Doulting stone dressings. The roof is open timbered, covered with Broseley tiles of a special make. The woodwork of the roof and of the interior fittings is of pitch-pine, varnished.

Peckham.—On the 20th ult., a public meeting was held in connexion with the opening of a new Board school in the Credon-road, Peckham. The chair was taken by Mr. R. Freeman, the vice-chairman of the School Board. The school contains accommodation for 480 boys, 480 girls, and 650 infants, and has been erected from the designs of Mr. E. R. Robson, architect to the Board.

STAINED GLASS.

Ringwood.—An addition has just been made to the adornments of the chancel of St. Peter's and St. Paul's Church, Ringwood. It consists of a stained window, by Messrs. Ward & Hughes, of London, erected to the memory of the late voluntary organist of the church, Elizabeth, wife of Mr. J. Holliday, formerly of Ringwood. The subject of the window is St. John, "the beloved disciple." The Apostle is represented, in full-size figure, as standing in an attitude of adoration, with his eyes fixed on the wonderful scenes he witnessed in the Isle of Patmos. Over his head is a richly-executed canopy, above which an angel is represented as holding his crown of life. The lower panel of the window contains a representation of a choir of angels with musical instruments.

Horton.—A new stained glass window by Kempe has been erected in Horton Church, near Slough, by Mr. Tyrrell, in honour of the holy Nativity, and in memory of his late wife.

Carlisle.—Mr. Charles Evans, of Warwick-street, London, has lately erected a painted window in Irthington Parish Church. The subject is "The Ascension." The window is very elaborate in detail, numerous cherubim being introduced in close proximity to the central figure of our Lord, and the window has been designed strictly in accordance with the architecture of the church. It is the gift of the Rev. Thos. Hodgson, in memory of his brother.

Books.

Lectures on Art: delivered in Support of the Society for the Protection of Ancient Buildings. London: Macmillan & Co.

THE lectures included in this volume were delivered partly, it appears, as a means of replenishing the funds of the Society under whose auspices they were given, which therefore would not seem to have recommended itself to public support to any great extent, if its conductors have been obliged to resort to this method of producing the sinews of war. The lectures are six in number. Mr. R. Stuart Poole, the Keeper of Coins and Medals at the British Museum, contributes one on "The Egyptian Tomb and the Future State"; Professor Richmond one on "Monumental Painting"; Mr. Poynter, "Some Remarks on Decorative Art"; Mr. Micklethwaite, one on

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'English Parish Churches"; and Mr. W. Morris, two on "The History of Pattern Designing," and on "The Lesser Arts of Life." The last-named lecture embodies a good many of the opinions expressed in a recent volume of lectures, published by its author, and which were noticed in our columns at the time of their appearance. In most of the sentiments of this last lecture we agree, only objecting to the author's over-acted solemnity about rather small things, and his too-sweeping denunciations. In speaking of glass, for instance, he says:—"It is matter of course that I am only thinking of that which is blown and worked by the hand; moulded and cut glass may have commercial, but cannot have artistic value." It is quite true that the method recommended here is the most rational, and the one which brings out best the most characteristic qualities of the material, but it is absurd to say that artistic feeling and artistic effect cannot be realised in cut glass at all. Mr. Morris is continually weakening his own arguments by these sweeping and inaccurate statements. He says truly, in regard to painting on pottery, "Don't paint anything on pottery save what can be painted only on pottery; if you do, it is clear that, however good a draughtsman you may be, you do not care about that special art. You can't suppose that the Greek wall-painting was anything like their painting on pottery." That is exactly, however, what a great deal of it probably was very like, as Mr. Poynter observes in another lecture in this very volume. We are glad, however, to see for once an admission from a preacher on decoration that there are limits in the excellence of Chinese and Japanese art. Mr. Morris observes that "these non-architectural races (let the Chinese stand as a type of them) have no general mastery over the arts, and seem to play with them rather than try to put their souls into them. Clumsy-handed as the European and Aryan workman is (of a good period, I mean), as compared with his Turanian fellow, there is a seriousness and meaning about his work that raises it as a piece of art far above the deftness of China and Japan; and it is this very seriousness and depth of feeling which, when brought to bear upon the matter of our daily life, is, in fact, the soul of architecture, whatever the body may be; so that I shall still say that among ourselves,—the men of modern Europe,—the existence of the other arts is bound up with that of architecture." We are grateful for a remark so true and so well put, and which is in opposition to some of the exaggerated worship paid at present to Chinese and Japanese art. The constant colloquialisms of Mr. Morris's style, his perpetual use of "don't" and "can't," and such inelegant abbreviations, form a great drawback to his writing, even when we agree with the opinions expressed in this jaunty fashion. The lecture on "Pattern-designing" contains much that is interesting, and is the best and most practical in the book. There is definite information conveyed in the lecture by Mr. Poole, who is learned in Egyptian archæology. The other lectures are suggestive in places, but somewhat desultory, nor can we perceive that anything very much is to be learned from them. Mr. Poynter, we observe, also enters his protest against the exaggerated love of mere *objets de luxe*. He speaks of the hundreds of exquisite little terra-cotta figures from Tanagra, which have been discovered within the last ten or twelve years, but of which he says:—"Not a dozen, I believe, have found their way into this country; there are a few in the British Museum. The French have the good taste to buy them all. I do not imagine that the best of these exquisite works, the purest expression of the Greek artistic instinct, ever rose in price to that of a hawthorne jar at Christie's, and yet there is more art in the little finger of the man who made one of those figures than in the whole Chinese nation." Professor Richmond's lecture is a recommendation of the idea of the mutual advantage of the union of painting and sculpture with architecture,—true on the side on which he looks at it; but he fails, like so many other advocates of monumental art, to see the other side. "Architecture calls, being conscious of her own limits, for the fanciful and sensitive blow of the chisel to enrich and moderate her severity; Sculpture, while she adorns, is awed and constrained by the naked beauty of architecture; Painting, when in contact with both sculptor and architecture, catches their chastity of form, their reserve, their regulated quantities, while the full tones of colour give life to the bare surfaces that are permitted to her." True enough, and well expressed as far as it goes; but painting has a life of her own apart, as well as this, and in some senses a higher life. Titian and Turner were not monumental painters.

It is curious to observe the different methods in which the lecturers turn the close of their discourses to what preachers would call the "application," the reference to the Society for whose aid they were given. Mr. Poole gives what is, from his point of view, a practical illustration; he says that his feeling, as Keeper of Coins in the National Museum, is very strong against restoration, "because I have suffered long and tedious labour, and have had to draw upon the national purse for thousands of pounds to replace the Roman coins which had been touched up and restored, and consequently had lost all their historical value." It does not seem to occur to Mr. Poole that a building has some practical uses which an old coin has not, and that the cases are not quite parallel. Professor Richmond and Mr. Poynter pass over the matter. Mr. Micklethwaite, who we suspect is not quite a "sound" believer in the creed of the Society, and has not entirely parted with common sense in the cause, forgets himself so far as to say that churches have a life in the present; that the present generation has as much share in them as any of the past, and the same right to alter them according to its wants; and he is profane enough to suggest that there is much in some churches which may with advantage be removed. But Mr. Morris comes to the rescue. According to him, Oxford exists not for the pursuit of literature and science, but for the sake of the contemplation of the old buildings. "The poor remains of our old buildings in themselves, as memorials of history and works of art, are worth more than any temporary use they can be put to. Yes, apply it to Oxford if you please. There are many places in England where a young man may get as good book-learning as in Oxford; not one where he can receive the education which the loveliness of the gray city used to give us. Call this sentiment if you please, but you *know* that it is true." Mr. Morris's audience may have known no better certainly. But it would be a pity to spoil that by any further comment.

Miscellanea.

Condemned Houses at Bristol.—In the House of Commons on Monday, Mr. S. Macliver asked the President of the Local Government Board if his attention had been called to the action of the Sanitary Authority at Bristol in summoning the owners, chiefly working men, of seventy-four houses condemned by the Medical Officer of Health, those houses having been erected on the strength of the official sanction to the plans; and whether such proceedings, without compensation to the owners of the property, were approved by the Board. Mr. Dodson, in reply, said:—I have communicated with the Sanitary Authority on the subject. I find that the Medical Officer of Health has reported a number of houses as being unfit for human habitation, because they are built on low lands, which are liable to be flooded whenever there is an excess of rain. It is true that the houses have been built in accordance with plans submitted to the Sanitary Authority in pursuance of their by-laws; but when the plans were before the Sanitary Authority they had only to consider whether the requirements of the by-laws were satisfied; and the by-laws referred to the structure of the buildings and not to the fitness of the site. The Sanitary Authority, therefore, gave no approval to the site. The Local Government Board have no control over the Sanitary Authority in this matter, but the case will be brought before the Justices before the houses are closed, and it will, of course, be necessary to satisfy them that the houses are, in fact, unfit for habitation.

A Piece of Mosaic Work, representing St. John the Divine, executed for St. John's Church, Fauresmith, Orange Free State, is on view for a few days at Messrs. Thomas Pratt & Sons, 24, Tavistock-street, Covent-garden.

Lord Mayor's Day.—Messrs. Piggott Bros., of Bishopsgate-street, erected the arch and decorated the ward of Cripplegate for the Lord Mayor's Show.

Hittite and Babylonian Antiquities at the British Museum.—Within the last few weeks the authorities of the British Museum have received a considerable addition to the monuments previously obtained from the excavations which have been carried on under the superintendence of Consul Henderson, at Jerablus, on the Euphrates, the reputed site of the renowned city of Carchemish. The national collection has thus been enriched by more than thirty fragments of various sizes. There are on some of them parts of inscriptions; but, unfortunately, these are very far less considerable than those on the three principal monuments previously acquired. Besides the portions of inscriptions, there are fragments bearing ornamental devices, and others which may possibly have represented on a large scale parts of a lion or some other animal. There are also large portions of two human figures, one much defaced, but apparently not differing very greatly in type from examples with which we were previously acquainted. Of the large consignment of Babylonian inscriptions received from the excavations conducted by Mr. Rassam, only a part has yet been examined, consisting in by far the larger proportion of contract-tablets.

St. Bartholomew's, Smithfield.—At a meeting of the Vestry of the parish of St. Bartholomew-the-Great on the 3rd inst., the Clerk brought up a report of the Works Sub-committee, which stated that there was much that required immediate attention. The roof was in a sad condition. The tower required repairing and pointing. The sub-committee had themselves seen to some of the most urgent repairs; 300*l.* was wanted at once to put the church in a condition fit for worship. The Vestry Clerk suggested that it would be a good thing if the vestry were to make an appeal to all the City companies and the archæological societies to help them to put this unique and venerable edifice in thorough repair. The Vestry Clerk then moved that the Works Committee, with the sub-committee, continue their services. The motion was seconded by Mr. Wildash, and carried. From recent visits we can bear testimony to the need of something being done for the preservation of this church. The works carried out some years since were mainly limited to the prevention of the threatened collapse of the building, and to the partial opening out of the Norman apsidal arcade. Funds for further works of reparation were not then forthcoming.

Proposed Removal of City Churches in Manchester.—Manchester, like London, has its city churches question. Some time since a scheme was suggested for the closing of some of the churches in the city on the ground of the sparse attendance, caused by the constant demolition of the neighbouring dwelling-houses, and the consequent removal of the population to the outskirts of the city. Since then no action has been taken in the matter, which practically fell into abeyance; but the *Manchester Courier* states that measures will shortly be taken for the closing of one or two "deserted" churches in the centre of the city, the proceeds of the sale of the sites to be devoted to the erection of new churches in the suburbs. Some years since St. Clement's Church, Lever-street (which was not a consecrated church), was sold, and is now occupied as an iron warehouse. The proceeds of the sale formed the nucleus of a fund out of which the three churches of St. Clement at Lower Broughton, Higher Openshaw, and Greenheys were largely built, the grants from the fund being supplemented by subscriptions.

Electric Lighting and its Dangers.—To be struck dead by lightning is a possibility hanging over the head of every inhabitant of this part of the world. A new peril is added, of being killed by contact with an electric light wire. A few weeks ago in a street in the lower part of this city many horses were shocked by currents escaping from the side-walk. On Saturday last the Central Methodist Church sent out shocks from its iron fence more powerful even than those which emanate from its pulpit. Passers-by were stunned by contact with the fence in which electricity escaping from a wire which fed a light next door to the church had grounded. To "lightning and tempest" as calamities to be prayed against must be added the electric light. Meanwhile, protective legislation is called for.—*New York Christian Advocate.*

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The Sanitary Condition of Brighton. Dr. B. W. Richardson, F.R.S., has reported to the Mayor and Corporation of Brighton the results of a complete and independent sanitary inspection he recently made of that town. He finds that there is no specially prevailing epidemic or contagious disease in the town or district; that there is nothing whatever to point to any extant local cause as producing such diseases; that the health of the town is unusually good; that from the nature of the supply it is only from the most culpable negligence that the water can be made a medium for the conveyance of disease; that he found nothing whatever that could lead him to believe in the occurrence of any special disease or mortality from bad drainage; that the roadways and side-pavings are, on the whole, exceedingly good; that the slaughter-houses and cowsheds are, as a whole, no better and no worse than in other large towns; and, lastly, that the death-rate of Brighton was below that of the country in general. Dr. Richardson concludes by suggesting a few improvements in regard to mortuaries, public baths, washhouses, laundries, lavatories, slaughter-houses, new model lodging-houses, the removal of dust and rubbish from the town, the reception of sick from Brighton schools and other places, public markets, and the drainage and removal of sewage. The *Lancet* has published Dr. Richardson's report, together with a conciliatory article, which, the *Brighton Herald* understands, has been deemed so satisfactory that the Town Clerk, by direction of the Libel Sub-Committee (consisting of the Mayor, the ex-Mayor, the Town Clerk, and the Corporation Solicitor), has given instructions for all further proceedings against the *Lancet* to be abandoned. This decision is a wise one. We said some time ago that the Brighton authorities would do well to abandon the proceedings.

The Changes at Hyde Park Corner.—In the House of Commons, on the 3rd inst., Mr. Warton asked the First Commissioner of Works whether any contract had been entered into in respect of the contemplated alterations near Hyde Park Corner; and, if so, whether the contractor had undertaken to remove the arch near Hyde Park Corner bodily to its new position; and, if not, whether he could state why. Mr. Shaw-Lefevre, in reply, said,—I have entered into a contract for the execution of the works at Hyde Park Corner, and they are now in course of progress. With respect to the Wellington Arch, I told the House in July last that I expected it would be moved bodily. I had been advised by more than one authority that this could be done at a considerably less cost than that of pulling it down and rebuilding it. When, however, the plans for removing it were submitted to a contractor, it was found that, owing partly to the flimsy construction of the arch, and partly to the slippery nature of the soil on which it would have to be moved, the cost of the removal was about the same as the cost of pulling it down and rebuilding; and consequently, by the advice of Mr. Fowler, the eminent engineer, I abandoned the project of moving it in a more adventurous manner. The statue will come down in consequence of the arch being pulled down. When the arch is rebuilt, the statue will not be reinstated without some previous experiments to find some better and more dignified place for it.

New Shops, Birmingham.—Mr. C. Ede, milliner, of Birmingham, has been erecting a number of shops, situated in Constitution-hill, one of the leading thoroughfares of the town. They are in the Early Gothic style, freely rendered, and the elevation includes a series of bay windows, two stories in height, and diminishing in width, terminating with panelled and enriched pinnacles. The front of the building is relieved by bands of moulded stone and brick, terra-cotta panels, and stone diapers. The work has been performed by Mr. Evans, builder, from designs prepared by Mr. J. Statham Davis, architect, both of Birmingham. The cost will be about 5,000*l*.

Fine Art Exhibition at Swaffham.—A fine art exhibition has been opened at Swaffham, in aid of the funds for the establishment of an art class in the town. The authorities of the South Kensington Museum lent some valuable *objets d'art*. The loan collection of pictures from Narford Hall and elsewhere included works by Crome, Cotman, Etty, R.A., Francesco Guardia, Watteau, Jacob Ruysdael, Sir Godfrey Kneller, Hogarth, Zoffany, Nicholas Maas, Gaspar Poussin, and other well-known painters.

Prehistoric Remains in Cornwall.—During a recent outing of the Penzance Natural History and Antiquarian Society, the party, after visiting Halsetown, proceeded to the Stennack, where Mr. Borlase, M.P., described some prehistoric remains, generally known as a "Pict's House." The building they were looking at, he said, if it was anything at all, was a very great curiosity indeed, because it was the only specimen that they had in Cornwall of that class of antiquity which was common in Scotland, where they were known as "Picts' houses," in the Western Islands and Orkney and Shetland, and also on the west coast of Ireland. It was first brought to the notice of antiquaries in this country by the Rev. William Bazeley, who sent an account of it to Mr. G. B. Millett, the secretary of their society, who visited the place and made a plan of it. The building differed entirely from the ordinary bee-hive house. If it was what he thought it was, it was the remains of what was known in the northern counties as a "burgh." If it were not one of those buildings he could not think what it was, for it was not at all like the bee-hive structures, several of which he had himself excavated. Canon Venables had called the attention of antiquaries of the West Country to the fact that the Cornish prehistoric monuments were not inserted in Sir John Lubbock's Bill, the reason assigned being that they were in Duchy property. He (Mr. Borlase) did not for one moment believe that if a proper application were made to the Duchy to have those monuments which might be upon its ground included in the Bill, there would be the least difficulty about the matter. Mr. Borlase added that plans of the rude stone monuments of Cornwall, most carefully prepared by Mr. Lucas, were at present in the hands of the Society of Antiquaries, who were about to print them at their own expense.

Damage to Roads by Traction Engines.—On the 3rd inst. a deputation waited upon Mr. Dodson, at the offices of the Local Government Board, to urge upon him the necessity of restricting the use of traction engines on highways. The deputation, which was a numerous one, was introduced by the Duke of Buckingham. Mr. Stuart Wortley, M.P., said that the question resolved itself into two main heads,—the damage done by traction engines to the roads, and the danger caused by them to the other traffic on those roads. One point to be considered with regard to the damage was the increase in the maximum weight allowed for these engines, which had risen from 10 tons to 14 tons, while the width was also increased from 7 ft. to 9 ft. The damage to the road was also increased by the use of diagonal cross-bars on the wheels. The Duke of Buckingham endorsed what the last speaker had said, and stated that while they had no wish to see steam traffic abolished, they wished to see the drivers of the engines licensed as competent persons. Mr. Dodson promised that the memorials should, when the time for considering the question arrived, have the most careful consideration of the Board.

Bequest to the Yorkshire Fine Art Institution.—The *York Herald* announces that by the will of the late Mr. John Burton, of Poppleton Villa, York, the whole of his gallery of pictures by modern artists passes into the hands of the Council of the Yorkshire Fine Art and Industrial Institution, of that city. There are, however, certain conditions attached to the bequest, such as that they shall be placed in one of the galleries of the Institution together, and shall be called the Burton Collection, and that a proportion of the proceeds arising from their exhibition shall be annually handed over to the Lord Mayor and the Sheriff of York for the time being, to be by them distributed amongst the poor of the city of York and of Upper and Nether Poppleton.

New Public Hall at Kingston-on-Thames.—Kingston has, for some time past, felt the want of a good hall, available for assemblies, concerts, &c., and Mr. George Bristow, a resident, has just accepted a tender for the erection of a building, to be called the "Albany Hall," on a site in the Fife-road, close to Kingston Station. The architects are Messrs. Robbins & De Boinville Bros., of 2, Victoria-mansions, S.W.; and the building, which is in the Classic style, is to be of red brick relieved with stone dressings. The contractors are Messrs. Oldridge & Sons, of London-road, Kingston, and the amount of their contract is 3,872*l*.

TENDERS

For the erection of schools for 250 boys, 250 girls, and 250 infants, in Crowle-street, Hedon-road, Hull, for the Kingston-upon-Hull School Board. Mr. W. Botterill (Botterill, Son, & Bilson), architect to the Board. Quantities by the architect:—

J. T. Skinner	£6,290 0 0
Henry Grassby	6,260 0 0
Wilson Bros.	6,200 0 0
R. Sergeant	6,170 0 0
B. Musgrave, jun.	6,098 0 0
Executors of T. Southern	5,772 6 4
John Drury	5,763 0 0
Habbershaw & Son	5,644 17 8
Jackson & Son	5,625 0 0
J. Stamp & Son	5,568 17 6
Hockney & Liggins (accepted)	5,500 0 0

For alterations and repairs at No. 24, Paradise-street, Marylebone, for Viscountess Ossington. Mr. Charles Fowler, architect:—

Staines & Son (accepted)	£620 0 0

For taking down and rebuilding walls of the Corner Pin tavern, Stibbington-street, Somers-town, for Messrs. Podzus & Palmer. Mr. W. F. Potter, architect:—

Richard Scowen (accepted).

For proposed new offices, Whittington-avenue, Leadenhall-street, E.C., for Messrs. M. & N. Salamon. Messrs. Edward Ellis & Son, architects. Quantities by Mr. W. B. Brown:—

		Less if Bath Stone.
Tongue	£27,000 0 0	... —
Goodman	25,789 0 0	... £670 0 0
Croker	25,217 0 0	... 610 0 0
Downs	24,964 0 0	... 590 0 0
McLachlan	24,910 0 0	... 552 0 0
Hall, Beddall, & Co.	24,764 0 0	... 850 0 0
Brass	24,639 0 0	... 577 0 0
Richard Conder	24,444 0 0	... 720 0 0
Colls & Sons	24,440 0 0	... 580 0 0
Edward Conder	23,941 0 0	... 770 0 0
Ashby & Horner	23,920 0 0	... 690 0 0
Kirk & Randall	23,843 0 0	... 843 0 0
Boyce	23,840 0 0	... 680 0 0
Ashby Bros.	23,355 0 0	... 665 0 0
Adamson	22,984 0 0	... 600 0 0
Shepherd	22,800 0 0	... 600 0 0
C. Wall	22,600 0 0	... 600 0 0
Greenwood	21,000 0 0	... 900 0 0

For rebuilding Nos. 3 & 4, New-street, Bishopsgate-street, for Mr. H. W. Eaton, M.P. Mr. Charles Bell, architect. Quantities by Mr. H. Lovegrove:—

Cubitt & Co.	£1,800 0 0

For shop fronts and fittings to premises, 187, High-street, Deptford, for Messrs. Kearley. Messrs. Wylson & Long, architects:—

Lake & Co.	£216 0 0
Bangs	165 0 0
S. W. Blythe	149 3 0
Lamprell	135 0 0

For alterations and fittings to 241, Old Kent-road, for Messrs. Kearley. Messrs. Wylson & Long, architects:—

Lake & Co.	£124 0 0
Bangs	108 5 0
Lamprell	105 15 0
S. W. Blythe	99 15 0

For works at St. Paul's parochial room, Allardyce-street, West Brixton. Mr. Alfred Wright, architect and surveyor, Hayter-road, Brixton Rise:—

Maxwell Bros.	£230 0 0
C. S. Haydow	200 0 0
J. Taylor	185 0 0
D. S. Rice	175 0 0
W. Johnson	160 0 0

For alterations and additions, and a new wing and offices, at the Glen, Camberley, for Dr. Atkinson. Messrs. Chas. Smith & Sons, architects, Reading:—

J. Allcock, Camberley (accepted).

For pulling down the old obelisk tower at the Knoll, Camberley, and other works, for Gen. Marshall:—

J. Allcock, Camberley (accepted).

For alterations, new shop front, and fittings, at 70, Cornhill, for Messrs. Dore & Sons. Messrs. Dunk & Gedeu, architects:—

Sage	£391 0 0
Drew & Cadman	375 0 0
Yardley & Sons	341 0 0

For the erection of lodge and entrance gates at St. Marylebone Infirmary, Notting-hill, for the Guardians of the Poor of the parish of St. Marylebone. Messrs. H. Saxon Snell & Sons, architects:—

Joliffe	£1,360 0 0
Batchelder	1,350 0 0
Bamford	1,345 0 0
Crockett	1,125 0 0
Howard	973 0 0
Wall Bros. (accepted)	931 0 0

For new boundary fence to new infirmary, Mile-end Old Town. Mr. J. M. Knight, architect:—

Barnes	£300 0 0
Wells	277 0 0
Bird	265 0 0
Collins	255 0 0
Johnson	248 0 0
St Pancras Iron Company	245 0 0
Parrish & Hawker	229 0 0
Lye	185 0 0

For works at 25, Bond-street, Lambeth, and premises in the rear, for the trustees of Thirtle Estate. Mr. Edwin J. White, 145, Holborn-bars, surveyor:—

J. Appleby	£285 0 0
Stone & Humphreys	250 0 0
Miller & Son	214 0 0
W. Smith	197 0 0
Eldridge & Gee, Bermondsey (accepted)	175 0 0

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For building warehouse on the site of Nos. 42 & 43, Fore-street. Mr. G. A. Dunnage and Messrs. Harvey & Protheroe, joint architects. Quantities supplied by Messrs. J. & A. E. Bull:—

Chappell	£2,279	0	0
Higgs & Hill	3,184	0	0
Colls & Son	3,085	0	0
Macey & Sons	3,057	0	0
Brass	2,985	0	0
Adamson	2,979	0	0
Bywaters	2,974	0	0
Morter	2,765	0	0
Larke & Son (accepted)	2,688	0	0

For the erection of new buildings at the Pumping Station of the Croydon Rural Sanitary Authority. Mr. R. M. Chart, surveyor:—

Lawrence	£395	0	0
Bass	285	0	0
Burnand	283	0	0
Knight	255	0	0
Prebble	227	0	0
Hazell	200	0	0

For the erection of two detached villa residences, main road, Sidcup, for Dr. S. W. Poole. Mr. H. D. Hatfield, architect:—

Haisman, Foot's Cray	£1,476	10	0
Wooller, Sidcup	1,467	2	0
Stebbings, Sidcup	1,143	0	0
Knight, Sidcup (accepted)	1,053	0	0

For completion of tower to Christ Church, Gipsy-hill, Norwood. Messrs. Giles & Gough, architects. Quantities by Mr. C. H. Goode:—

Nightingale	£2,289	0	0
Lathey Bros.	2,245	0	0
Mitchell	2,100	0	0
Downs	2,074	0	0
Colls	2,050	0	0
Adamson & Sons	2,038	0	0
Holliday	1,997	0	0
Bowyer	1,845	0	0
Aviss & Co.	1,840	0	0

For business premises, 1, Waltham-street, Hull, for Mrs. Atkinson, exclusive of plumbing, glazing, and gasfitting. Messrs. Botterill, Son, & Bilson, architects. Quantities by the architects:—

B. Musgrave, jun.	£1,189	0	0
Hockney & Liggins	1,183	0	0
H. Grassby	1,178	10	0
R. Sergeant	1,157	0	0
Mark Harper (accepted)	1,133	0	0

Accepted for the re-instatement of business premises, Bridge-street, Hull, recently destroyed by fire, for Mr. John Robinson. Messrs. Botterill, Son, & Bilson, architects:—

W. Lison (carpenter and joiner)	£290	0	0
Mark Harper (excavator, bricklayer, and plasterer)	162	15	0
Henry Halliday (plumber)	60	0	0
J. Hunter (slater)	49	18	0
William Barnes (stonemason)	19	0	0

For the bar-fittings at the Abbey Arms, Barking-road. Mr. Dawson, architect, Barking:—

Wood & Steep, Poplar	£203	2	0
G. Corderoy, Barking-road	175	0	0
Walker, Poplar (accepted)	147	0	0
Salt, Poplar	140	0	0
Atherton & Latta	138	10	0

For completing two carcasses in Culverden-road, Bedford-hill, Balham, for Mr. George Coldham:—

Thomas Potterton, Clapham Park*	£1,300	0	0

* Accepted.

For the erection of cottage in Hereward-road, Tooting, for Mr. Richard Johnson:—

Thomas Potterton (accepted)	£275	0	0

For alterations, &c., at the King's Head, Little Queen-street, Holborn. Mr. W. West, architect:—

George Hewish (accepted).

For desks and fittings at the Buckingham-street Schools, Hull, for the Kingston-upon-Hull School Board. Mr. W. Botterill (Botterill, Son, & Bilson), architect to the Board:—

J. Ward	£142	10	0
J. W. Smith	141	10	0
Taylor & Co.	140	8	0
Hockney & Liggins	140	0	0
T. T. Dickinson	136	16	0
Laverack & Goddard	134	17	10
Habbershaw & Son	132	0	0
Burgess & Co. (accepted)	130	10	6

For the erection of five pairs of cottages on the Imberhorne Estate, East Grinstead. Mr. S. W. Haughton, architect, East Grinstead:—

J. H. Godly, East Grinstead	£2,800	0	0
H. Martin, East Grinstead	2,650	0	0
J. Waters, Forest Row	2,628	0	0
A. Foster, East Grinstead	2,507	0	0
G. Beard, East Grinstead	2,493	0	0
Charlwood Bros., East Grinstead	1,900	0	0
W. Pledge, East Grinstead*	1,825	0	0

* Accepted.

For the erection of farm buildings, block No. 2, on the Imberhorne Estate, East Grinstead. Mr. S. W. Haughton, architect, East Grinstead:—

Charlwood Bros., East Grinstead*	£543	15	6

* Accepted.

For the erection of organ-gallery at the Vale Royal Chapel, Tunbridge Wells. Mr. S. W. Haughton, architect, East Grinstead:—

E. J. Strange & Sons, Tunbridge Wells	£97	0	0

For erection of Horse Exchange and Auction Mart, East Canal Wharf, Cardiff, for Messrs. Gottwalty & Bowring. Mr. Douglas Blessley, architect. Quantities by the architect:—

J. Thomas, Cardiff	£3,100	0	0
C. Bird, Cardiff	3,000	0	0
C. Dunn, Cardiff	2,990	0	0
C. Fox, Cardiff	2,900	0	0
E. Trotman, Cardiff	2,898	0	0
R. Price, Cardiff	2,850	0	0
S. Shepton, Cardiff	2,695	0	0
F. S. Lock, Cardiff	2,639	0	0
T. Gough, Cardiff	2,568	17	6
Thos. White, Swansea (accepted)	2,420	0	0
Symonds & Nurton, Cardiff	2,390	0	0
E. Howard, Cardiff	2,368	0	0

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The Builder.

VOL. XLIII. No. 2076. SATURDAY, NOVEMBER 19, 1882.

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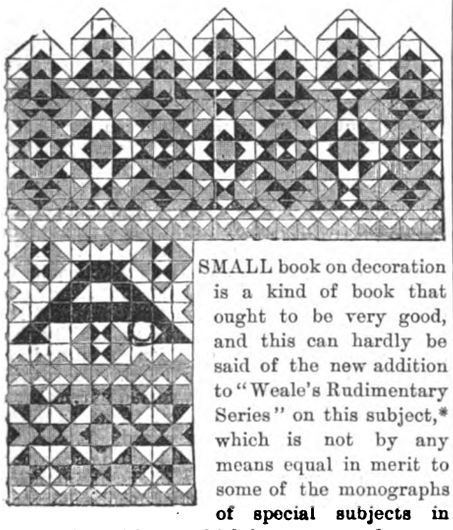
Some Publications on Decorative Design.



SMALL book on decoration is a kind of book that ought to be very good, and this can hardly be said of the new addition to "Weale's Rudimentary Series" on this subject,* which is not by any means equal in merit to some of the monographs of special subjects in connexion with art which have appeared among the earlier numbers of this generally excellent series. The object of such a publication should be to go to the root of the matter, and give the standing-ground from which to go further and fare better. Mr. Facey's book seems rather a collection of hints with pen and pencil; some of them good, some not very good, and not bound together by any very prominent or recognisable general principles. The aim of the writer, he would perhaps reply, is not to suggest such principles, but to give practical hints, "a course of suggestions applicable to those experiences ordinarily met with by the house-painter, who too frequently knows little or nothing of the most elementary rudiment of his business in its higher form as a decorative art." This is rather a contradictory sentence. The "higher form" of the painter's business, as "a decorative art" certainly needs something more, to furnish any useful guide, than some suggestions; and, on the other hand, it may be doubted whether such suggestions are of any real value to a less ambitious painter who wants to produce something "tasteful" without knowing exactly how to do it. Such a man is not likely to get further than copying and reproducing the suggestions given him, wherever they seem to fit in. He might do something worse if he trusted to his own taste and invention, no doubt; but the adoption of a few diagrams of ornamental design, however good in themselves (those given here are not all good), will really not bring him a whit nearer understanding what he is about, or make a decorator of him. The most practical and purpose-like remark in the book, looking at the matter in this light, is the recommendation in regard to the art of stencil-cutting, "First learn to draw." And the man who has learned that would not be very much in want of the rest of the book, except where it deals with practical difficulties in regard to the preparing of surfaces and colours for decoration.

A good deal of the small treatise is devoted to the consideration of stencilling, which may be called the workman's branch of decorating, and many of the hints given in regard to the use of this method of covering a space inexpensively with more or less decorative detail are useful. We differ from the author, however, in the idea that "taking out the ties,"—*i.e.*, painting over the gaps in a stencilled design by hand,—is by any means a necessary or even desirable sequel to the process. A stencilled pattern had better appear as such, and not try to look as if drawn by hand; and part of the art of stencil-designing consists in so arranging the design that the necessary gaps left for the ties should not appear to injure or break up the design. The character of a stencil pattern should be peculiar to that process,—should arise out of the process,—and should show its origin and manner of working frankly.

It would be perhaps unfair to criticise from an artistic point of view the original sketches of detail given; a good many of them are fairly applicable to their supposed position, and well drawn in regard to balance and delineation of curves, but none of them can be said to belong to other than a very ordinary standard of decorative art. In some instances there are heinous mistakes made which should be pointed out, as in the suggested external stencil adornments for a cemented house-front, fig. 57. This shows for its principal feature the surrounding of the windows with sprigs of foliage running up vertically from the extremities of the window-sills and turning to meet over the top. The planting of such ornaments on the face of the wall outside of the architrave lines, with no bounding line to give it weight or architectural form or feeling, would merely result in giving a ragged and tawdry effect to the whole. The writer can have no perception of the proper relation of ornament to architectural detail and architectural character, or he would never have put on record such an unhappy suggestion as this. We should regard it also as a great error in judgment to place conventional representations of flowers in the windows of a conservatory, where the real flowers are present in their natural form. Nor is it the right way of regarding decorative design to say that the dictum that all floral forms are to be conventionalised in ornament, is chilling to the student of nature, as presenting him with nothing but "cold conventionality." If the student of nature wishes to draw or paint flowers, that is one thing: if he wishes to invent ornament, that is another thing. In the latter case the floral forms are merely suggestions on which to build a creation of his own, having more direct relation to the architectural forms in connexion with which the ornament has to be used. That is, in fact, the real interest of decorative design; it is not copying, but creation or adaptation, calling out a different kind of intellectual effort from painting in its usual sense. The book is meant well, but we cannot regard it as at all up to what the subject demands, even in a "rudimentary" treatise.

The relation of American architecture and decorative design to European is an interesting and at the same time rather perplexing subject. For a long time it has appeared to amount in the main to following each phase of fashion in English work at a little distance behind, the various tastes for Gothic and Queen Anne, &c., appearing to reproduce themselves with little difference on the other side of the Atlantic. The author of "Democracy" has shown us the picture of an American lady of æsthetic tastes arranging her new room according to her liking, and we seem to be reading a description of the furnishing of a "flat" in some æsthetic quarter of London. America has developed individuality of late in certain branches of art, as wood engraving and decorative tiles; but not much, as far as we have evidence, in architecture and decorative detail generally. There is a certain satisfaction to be derived from the fact that the States chiefly copy English work rather than that of other European nations, and thus pay us the compliment of remembering our close relationship and following our tastes. We, on our part, somewhat tired of our own fashions, would be glad to get the benefit of some new idea from across the water. In regard to practical matters of comfort and convenient arrangement of buildings, our cousins could probably give us a good many suggestions; in regard to art, they seem at present to have little to offer that is new. We make these reflections *à propos* of the first number of a new art-magazine published in New York, "The Decorator and Furnisher," which has been forwarded to us, and which in some respects, we confess, puzzles us a good deal. The illustrations, with the exception of a certain chromo-lithograph, are mostly very good, and the artistic views expressed in the text in many respects sound and sometimes original. With these qualities is combined a style in some of the letterpress which in this country would be supposed at once to stamp a paper as third-rate. Among the editorial reflections on the first page, for instance, occurs a paragraph, to the effect that, "Speaking of good times reminds us that we want some first-class canvassers,—some of the kind that can capture a subscription at sight. This seems to be a good opening for some regular lightning-rod purveyors." Imagine an English paper professing to aim at a high position among its class, delivering itself in this fashion. In some other respects the paper is

a

* Elementary Decoration: a Guide to the Simpler Forms of Everyday Art as applied to the Exterior and Interior of Houses. By James Williams Facey, jun. Illustrated with sixty explanatory engravings, chiefly from designs by the author. London Crosby Lockwood & Co. 1882.

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English enough. Two of the articles are by an English architect and an English decorator, Mr. Edis and Mr. Day. The first two illustrations, representing what a carpet design should not be, and what it should be, respectively, show that the standpoint is still in the rear of English taste, for the bad form of carpet, which is very pronounced, is certainly not a kind of article that would *now* be found "in every average sale-room" in this country, though it would have been not so very long ago. The carpet intended to show what carpets should be is a very pleasing and very suitable design. Mr. Edis commences a series of articles on "Art applied to Decoration and Furniture of Modern Houses," in which we have no doubt that there will be a good deal that is suggestive; but it is a pity Mr. Edis commences by repeating the common fallacy of the moment about all art being decorative, and to give such misleading examples of this: stating that Titian "put his noblest thoughts on the common lath-and-plaster walls of Venice," as if every one did not know that Titian's greatest works were easel pictures; and that Michelangelo's greatest work was the decoration of a chapel ceiling, as if Michelangelo or any one else looked on the Sistine paintings as decorative, in the modern æsthetic use of the term. We hope the readers of the American journal will not accept such statements without a good many grains of salt. Mr. Day delivers a criticism of Owen Jones and his dicta on decorative art, in which he makes some points. But some of Owen Jones's mistakes merely amount to having asserted rather too dogmatically what is nevertheless usually right. It is quite true, as Mr. Day points out, that the tangential junction of curves is not a law or universal habit of nature, as Owen Jones very unaccountably asserted it to be; but it is nevertheless the fact that very little good ornament has been found or can be made in which the springing of the curves from one another is not tangential. So also it is undoubtedly true that all ornament need not necessarily, as Owen Jones asserted, be based on geometrical form and spacing (it must be remembered that Japanese ornament was not discovered when he wrote his "Grammar"), but it is certain that all the highest class of ornament that we have yet seen is geometrical in its basis. On the whole, there are not quite so many blemishes in the "Grammar of Ornament" as Mr. Day perceives; but nevertheless we may concur in his final summing up, which he adds as a thirty-eighth commandment to the thirty-seven of the Grammar: "Be grateful for your Owen Jones, but do not swallow his principles whole." Some designs for furniture that are given are good, and have some little novelty of style in the rich decoration of the surfaces by (apparently) inlay. Of the chromo-lithograph which professes to give some hints, in the shape of portions of ceilings, for design in colour, the less said the better; it is common-place in design, and poor in colour. As the proprietors are invoking the aid of English writers, they might be wise to get some English colour designs: they would probably be better than this, at all events. But in the main the "Decorator and Furnisher" seems to promise to be of some interest and value for American readers, at any rate; and we hope that it will obtain the desired phalanx of canvassers equal to "capturing a subscription at sight."

A publication of much the same type comes to us from Berlin, in the shape of the first number of the "Illustrierte Schreiner-Zeitung" (Illustrated Joiner's Journal; or "Cabinet-maker's" would, perhaps, represent it more correctly). This deals with a narrower section, of course, of decorative design, and the value as well as the bulk of the periodical, judging from the first number, lie chiefly in the illustrations. They are very neatly drawn and got up, as German illustrations usually are, but there seems to be no life or orginality, and certainly little enough of beauty or refinement, in German work of this class. Whatever the Germans may be doing in other branches of art, in this of decorative furniture they are certainly very backward. They seem content always with the same rather heavy and clumsily-assorted architectural forms, and the same uninteresting and inelegant ornamental detail; and among the furniture drawn in these plates there is really nothing we can call good or in pure taste except the doors in the second plate, which are perfectly simple six-panelled doors made of various woods, and the panels inlaid with a rather pretty conventional foliage pattern. In some stools and a table in the fourth plate the vulgarities of Louis Quatorze detail are reproduced in wood, without even the kind of refinement which the style in its original form might claim, owing to the fine execution often displayed in it. There is a coloured lithograph of a panel of inlay for a door, in what material is not stated, probably various coloured marbles; it is one of those inlaid imitations of natural flowers in which some artists both in Germany and Italy excel; but the flowers are intertwined around a framework of very poor and tasteless design. Altogether, we cannot say much for Berlin taste and achievement in these matters, if this new journal is to be taken as any indication.

ERRORS OF ARBITRATORS.

ANY ONE who knows anything at all of building contracts and building disputes is well aware that, when litigation arises out of them, in by far the larger number of instances the differences are settled by an arbitrator. That this is a much cheaper way of settling disputes than by the decision of a judge is more than doubtful, for it must not be forgotten that a competent arbitrator must be properly paid, and that the room in which the arbitration is held cannot be had for nothing. Therefore, in the result arbitration may be considered just as expensive a luxury as an ordinary lawsuit,—that is, one which does not involve any extra expense, such as the costs for commissions abroad. It is, therefore, of the greatest importance that arbitrators should act with the strictest regularity, and thus not put the parties either to the great expense of a new arbitration or to the lesser loss incurred by an attempt to set aside the award. For it is marvellous how eager suitors who have once entered into legal battles are to fight them out to the bitter end, and how they clutch at the smallest shred of a possibility of upsetting an adverse award. Again, the most upright arbitrator may in a moment of forgetfulness commit an act of indiscretion which may afford just the barest bit of ground upon which a dissatisfied litigant may hope to find room to upset the award, for "there may be ample misconduct in a legal sense to make the court set aside an award, even where there is no ground for imputing the slightest improper motive to the arbitrator." It is difficult, indeed, to find any strict definition of misconduct such as will induce a court of law to upset an award. Perhaps it may be roughly stated to be conduct which may tend to make the award an unjust one. Not an action which actually did make an award unfair, because about that there can be little question, but which might reasonably influence the arbitrator one way or another. A very recent case has been before the Court of Appeal, and was decided so lately as November the 8th, which will serve as an example of what has just been stated. The arbitration was in regard to certain land which had been taken by the Hull and Barnsley Railway. The arbitration in connexion with it had ended on the 13th of March, and on the 25th of that month the arbitrator, before making his award, had gone down and viewed the land. When on this spot he met the company's engineer, and had a casual conversation with him, which in no way related to the land except that, as a matter of curiosity, he asked him where the old river wall was, and then the engineer also pointed out the jetty said to have been silted up. Neither of these questions had any relation to the matter in controversy. Under these circumstances, the Court of Appeal did not consider that there was anything done by the arbitrator which could have influenced his decision, although the Court below had thought otherwise. But in delivering judgment, Lord Justice Baggallay made the important remark that, had there been a conversation between the arbitrator and the engineer as to the value of adjacent land, then this might have influenced the arbitrator's mind, and so have caused the Court to have set aside the award. But this remark and the judgment show very well how extremely careful arbitrators must be. A conversation of a few minutes about some points in adjacent land was very nearly upsetting a careful and lengthy arbitration which had run over fifteen days, and had the conversation been a little more connected with the land in dispute, there can be no doubt that the money spent over the arbitration would have been wasted. In an earlier case a very strenuous effort was made to upset an award, because the umpire and the arbitrator, together with a solicitor and shorthand writer, lunched together with and at the expense of one of the litigants. It was positively affirmed that the subject of the arbitration was never mentioned at the luncheon. "I have had," said the judge, "a great deal of difficulty on the subject, and I must confess that my first impression was that it would be better, on general principles, considering that what passed at the luncheon-table might, by possibility, have influenced the mind of the arbitrators, to set aside the award as a lesson to all parties in future not to adopt that line of conduct. But upon carefully considering the authorities, and upon looking at all the surrounding circumstances of the case, I come to the conclusion that I should not be justified upon setting aside the award on that ground." The judge then went over the evidence to show that nothing occurred which could, in the slightest degree, influence the umpire's judgment. But just as the Hull and Barnsley Railway case seems to contain a distinct warning to arbitrators not to go and visit a building or land the subject of dispute without a representative of each of the parties being present, so as to prevent any possibility of a suspicion of misconduct, so this earlier case is a warning against lunching either with or at the expense of one of the parties. In a still earlier case it appeared that the arbitrator, in the absence of one party to the reference, and without his consent, questioned a witness some days after the hearing. The arbitrator declared that the interview did not influence his judgment, and the apparent object of the questions was to help to form his opinion as to the way in which certain things in the nature of work to be executed on a particular spot which had to be done for the effectual carrying out of the award could be effected. But the Court held that they could not take into consideration the nature of the statements because there was a probability that the conversation in question might have influenced the arbitrator's mind. To consult a professional witness was very different from asking the opinion of a legal friend as to the best way to draw up the award. It was, in fact, what may be termed legal misconduct, although done without the slightest intention of unfairness on the part of the arbitrator. There are, of course, more flagrant acts of misconduct which too may be done without any corrupt motives, which clearly are of a nature to cause an award to be set aside. Some of these have been summarised in a well-known work,—Russell on "The Power and Duty of an Arbitrator,"—in these words:—"Thus the award will be set aside if the arbitrator refuse to postpone a meeting for the purpose of allowing a party time to get counsel on his part, where the other side unexpectedly appears by counsel; so if he receives affidavits instead of *viva voce* evidence, when he is directed to examine the witnesses on oath," and "if the arbitrator make his award without having heard all the evidence, or having allowed the party reasonable opportunity of proving his whole case." It is very clear, therefore, how very careful an arbitrator must be not to do any act which can, in the slightest degree, be likely to influence his opinion in an irregular manner. If he does do some such act, and becomes aware of it, he should at once give the parties full information of the particular step, and if the parties either expressly or impliedly waive an objection which would otherwise be valid, then the irregularity is purged and the award will stand good. What, however, we have here more particularly desired to point out is, not how irregularities may be waived, but the necessity of guarding against their occurrence at all. The instances which have been given above, and the very recent case of the Hull and Barnsley arbitration, show conclusively that the most apparently innocent acts may almost suffice to upset an award.

Dumbarton: the Deepening of the River Leven.—At the last meeting of the Dumbarton Harbour Board, it was agreed to accept the offer of 100*l.* forwarded by Mr. J. Watt Sandeman, C.E., Newcastle-upon-Tyne, to report as to the effect of deepening the river Leven 3 ft. deeper than that of the Clyde between Glasgow and Greenock, the effect it would have on its banks and the bridge across the river, as also the plant necessary for so doing.

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RICHMOND CASTLE.

The Swale, one of the principal tributaries to the Yorkshire Ouse, and the stream in whose waters Paulinus of York is said to have baptised 10,000 Pagan Saxons, rises in the north-western quarter of the county, in a wild and spacious tract of moor and moss, studded over with heights ranging from 500 ft. to 1,500 ft., and even reaching 2,000 ft., from all parts of which a number of becks and gills converge upon the old town of Muker, to form there a considerable volume of water in its brightest, purest, and most attractive form. From Muker the Swale takes, with many windings, an eastern course, down a dale, wild and lovely even among Yorkshire dales, past the town of Reath, beneath many a scaur and across many a holm, past places whose names fall strange upon the Southern ear, by many a camp of unknown antiquity, and by abbeys now venerable in ruin, until, about eighteen miles below Muker, it emerges in ample volume from one of the most charming of its gorges, and in one of a succession of bold and graceful curves, sweeps round a tall and precipitous headland of rock, which, rising on the left or northern bank, projects about 130 ft. above the stream, and seems fitted by nature for the site of a mediæval fortress. Such at least was the opinion of Earl Alan, when, five years only after the coming in of the Normans, in the centre of a brave and insubordinate population, here, upon the tabular summit of the rock, he founded the celebrated Castle of Richmond, the seat of a great Northern earldom, and the capital of a Shire of five wapentakes, and of an Honour, to both of which it gave its name.

While the castle occupied the broad summit of the promontory, and was protected naturally on the west, south, and eastern faces by a cliff, the river, and a steep slope, the neck of the peninsula to the north, not above 20 yards in breadth, connected the castle with the town which speedily rose up under its protection. Besides works in masonry, there seems originally to have been a ditch across the neck, including a narrow esplanade in front of the fortress. This is now, in great measure, filled up and built over, though the line of the depression may still be traced. Around the castle, but beyond the slope, and occupied by the old town, and beyond the river, the ground rises considerably and steeply, so that the castle stands in the centre of an amphitheatre of higher ground, though at distances far beyond the reach of the artillery of the eleventh or twelfth, or even of the fifteenth or sixteenth centuries. A short but charming summary of the position and features of Richmond Castle will be found in Freeman's "Norman Conquest" (vol. iv., p. 296).

Before the Conquest this territory, under some unremembered name, was the inheritance of the English Earl Edwin, whose "aula" or hall was at Gilling, about one mile and a half east-north-east of the village of that name, and about the same distance from the castle. Here the earthworks that usually marked the great English residences long remained, though now they have disappeared under the plough and spade. Gilling, by Bede called "Ingetlingum," being the "ing" or meadow of Guille, is a place remembered for the slaughter there of Oswi, King of Northumberland, in A.D. 651. He also tells that an expiatory monastery was built, where prayers were offered up for both murderer and murdered. Of all this nothing is locally remembered, but the actual site of Earl Edwin's residence is still called Gilling Castle, and is in a field attached to Scales farm, near a way known as Gilling-lane. Earl Edwin's "aula," though commanding a noble view, had no natural advantages for defence, and, therefore, Earl Alan, on obtaining the soke of Gilling, moved the chief seat from hence to the place which was named, not inappropriately, Richmond.

It is not probable that a position so marked out by nature as a rock of defence was neglected by the early inhabitants of the district. A formidable entrenchment, known as the Scot's Dyke, is still traceable from Gilling village southwards to the Swale, south of which it sweeps round to the west so as to protect the castle rock. At a distance of half a mile, Roman remains, coins, and pottery have been found between the rock and the river. There is, however, no actual evidence that the site of the castle was ever actually occupied by either Briton or Roman.

Alan, surnamed Fergaunt, was the second son of Eudo, and, in succession to his father, Earl of Bretagne. He was present at Hastings, and,—by a charter preserved by Camden, granted by William while besieging York, and therefore at Christmas 1069-79,—received the land of Earl Edwin in Yorkshire. The grant is specified in Domesday as the "Terra Comitis Alani," containing 199 manors, of which 108 were waste. The roll begins with "Ghellinges habuit Edwinus Comes." Domesday also mentions the castle. The "Registrum Honoris de Richmond" informs us that Earl Alan founded the castle there, which, no doubt, he did after his return from the harrying of Northumberland in 1070, and built the encircling wall as quickly as possible,—it is said in 1071, as without it he could not long hold the place. He also attached the chapel of his castle, and with it the parish church, to the house of St. Mary at York. Alan married the Conqueror's daughter Constance, but died 1089, childless. Dugdale says he held, in divers counties, 452 lordships. The soke of Gilling was under Earl Edwin geldable, but it was afterwards enfranchised in favour of the Norman lords. Alan was succeeded by his brother Alanus Niger, Alan the Black, Earl of Bretagne and Lord of Richmond, which had become an Honour. He died, in 1093, leaving a son or a brother,—

Stephen, Earl of Bretagne,—who died there, 1137. He is said to have been succeeded by his second son,—

Alan, who is styled "Comes Britanniæ et Angliæ." He also held the Earldom of Cornwall. He died, probably 1145-6, leaving a son,—

Conan le Petit, Duke of Bretagne and Earl of Richmond, the first so called. He died 1171, and is generally regarded as the builder of the keep in 1146. He gave to St. Mary's the tythe of the castle mills. He married Margaret, sister to William, king of Scotland, and he left by her a daughter, his heiress. At his death the Honour fell into the hands of Henry II. 18 Hen. II., 1171-2, the Honour of Earl Conan was let in farm by the king, and the farmer had to account for the manors, the service of the Drengages, and the third part of Gipeswic, besides the scutages of the knights. The number of the latter had, however, not been correctly ascertained. The fees were scattered widely through many counties.

Constance, Duchess of Bretagne, married thrice,—first, in 1166, Geoffrey, fourth son of Henry II., by whom she had Arthur, whose death in 1203 has been dramatised by Shakspeare. Geoffrey was killed at a tournament at Paris in 1186-7. Her second husband was Ranulph Blundeville, Earl of Chester, from whom she was divorced. Her third was Guy, Vicomte de Thouars, who became tenant by the courtesy, and who died in 1213. By the last she had two daughters, of whom the eldest, Alice, was the final heiress.

Alice was in ward to King John, who was in no hurry to give up her possessions. 1st John the earldom contained 140 fees, on which the Countess of Bretagne paid 280 marcs for the first scutage in the new reign. This may, however, have been Constance, the time of whose death is uncertain. 2nd John, the honour was in the king's hands. 4th John, 1203, Guido de Toure [Thouars] was "quondam comes Britanniæ," so that Constance must then have been dead. His acts in the earldom regarding certain fines are confirmed by the king. In 1204 John appointed bailiffs for the Honour. 1205 he informs the tenants that he has granted the Honour, late that of "G. Comes Britanniæ," to R., Earl of Chester, the earl from whom Constance was divorced. John was at Richmond on the 14th and 15th of February, 1206.

8th John, 1207, Hugh de Nevill held the castle as constable during pleasure. He superseded Roald Fitz-Alan, who was constable in 1205, and had a considerable grant of lands. Roald had been disseized for refusing to swear touching the thirteenths, and gave 200 marks and four palfreys to be quit of his fine and to have his office restored, and besides to have letters patent enabling him to distrain upon the knights of the Honour for their castle-guard.

1209, 10th John. Alice, duchess of Bretagne and Countess of Richmond, invited her Breton vassals to support King John. She was probably still a minor. April 29th in this year, John was again at Richmond, and again, 15th June, 1212, in which year, and 1213, he still held the Honour, and in 1215, Roald was constable. Soon after, 17th John, 1216, the constable of Richmond Castle was directed to obey the orders of Ranulph, Earl of Chester, and to discharge from prison the knights and men belonging to Roald Fitz-Alan, who, therefore, in the short intervening time seems to have fallen under suspicion and then to have cleared himself. The Earl of Chester probably succeeded him, for in 18th John, 1216, he is ordered, if he cannot hold the castle, to destroy it utterly. Countess Alice married Peter le Dreux, of the blood royal of France, who in 1219 had livery of the Honour. 14 Hen. III, he is styled Duke of Bretagne and Earl of Richmond. By his adhesion to French interests in 1235-6 he forfeited his English honours. He died childless in 1250.

In 1241, Henry granted the Honour to Peter of Savoy, uncle to Queen Eleanor; he held the Honour and Shire of Richmond till his death in 1268, when, under a power granted him by the king in 1262, he bequeathed them to the queen, who compounded for an annuity of 2,000 marks. Henry then, in July, 1268, granted the Honour to John le Dreux, son and heir of the preceding Peter.

John le Dreux, Duke of Bretagne, succeeded to the earldom in 1268, but passed it to his son. He died 1286.

John le Dreux had the earldom from his father in 1268, and by licence from Henry III., his father-in-law, in 1269. He also became Duke of Bretagne. He married Beatrix, daughter of Henry III., and was killed at Lyons, 1305. This earl, on his departure for Palestine in 53 Henry III., founded a chantry for six priests in his chapel of Richmond, which could scarcely have been the Norman oratory in which six priests could barely find room. They were to be lodged near the great chapel, but to leave the castle during war. Duke John left Arthur and John.

John, the second son, succeeded by grant from Edward I., 1306. He was summoned as "John de Britanniæ, comes Richmond." He was taken prisoner while in the king's service in Scotland (17 Ed. II.), and the king, failing to obtain money for his ransom from Parliament, addressed a letter to the tenants of the Honour, adjuring them, for the sake of natural justice and by their duty and fealty, to contribute according to their holdings. The appeal seems to have been successful, for next year the earl was free. He died unmarried, 1334, and was succeeded by the son of his elder brother,—

John le Droux, Duke of Bretagne, and Earl of Richmond from 1335 to his death, childless, in 1341, when the earldom escheated to the crown. Upon his inquest it is stated, "Et est apud Richmond quoddam castrum quod nihil valet per annum infra muros, nec in fossa ejusdem castri, sed multum indiget in reparatione domorum et murorum dicti castri." He had licence to wall the town, and houses were cleared away for it; but it is doubtful whether anything more was then done. The gateway between the castle and the river bridge seems of about this date, and may very probably have been part of an intended wall.

John le Dreux, half brother to the last earl, and Comte de Montfort, became Duke of Bretagne, and had a grant of the earldom of Richmond in 1341. He died 1345, leaving a son; but, probably by some arrangement with the king, the earldom was granted to John of Gaunt, who was created earl, but resigned the whole into his father's hand in 1372.

John le Dreux, the "Valiant," Duke of Bretagne, Comte de Montfort, son of the last Earl John, received the earldom from Edward III. in 1372, and is styled Earl of Richmond. His French interests were very great, and (7 Ed. II.) he forfeited those held in England. His sister Joan, widow of Ralph Basset, had a grant of the Honour, as afterwards had Ralph Neville, first Earl of Westmoreland. It was then held successively by John, Duke of Bedford, Edward of Hadham, and Henry VII., with whom ceases any remarkable interest in the owners. The title, an evident but scarcely creditable proof of the estimation in which it was held, was conferred by Henry VIII. and Charles II. upon their illegitimate children.

DESCRIPTION.

Though not precisely of one date, the remains of the castle are mainly of the Norman period. The keep has of late been occupied as a militia store, and is so employed to the strict exclusion of visitors, notwithstanding that spacious barracks have been built not far off. The

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remainder is in ruins, but the prohibition covers the whole area, and the keep is not allowed to be sketched even from the exterior. There is no trace of any fortification preceding the present, nor of any of those massive earthworks which usually accompany Norman castles, when placed on English sites. These, whatever they were, were at Gilling: all here is Norman, and the chief works therefore are in masonry. Those in earth are but moderate.

The castle seems to have been composed of a main, east, and north ward or barbican. The main ward is roughly triangular, the outline being governed by the ground. The base or southern face is about 186 yards long, and crowns the edge of a cliff of about 30 ft. high, at the foot of which a very steep slope of 100 ft. more descends to the river. A shelf has been judiciously cut at the base of the cliff for a modern footpath, whence is a charming prospect of the river and the castle mills, as well as a close view of the exterior of the wall. The west side,—about 130 yards,—crowns a depression very steep but not precipitous, and now more or less covered with cottages. Here, just below the castle wall, is a water-gate, having a highly-pointed arch placed in a segmental recess. This gateway stands in a fragment of wall, probably part of the defence of the town, and about 5 ft. thick. The east front, also 130 yards, is less strong by nature. There, from the base of the wall, which is of great thickness, a gentle slope descends towards the river, from 50 to 100 yards distant. A part of this slope is occupied by the east ward. The northern part, or apex of the triangle, is rounded, and upon it are placed the main entrance and the keep.

The north ward is very small, about 40 yards by 30 yards, and was, in fact, a sort of triangular barbican or outwork, covering the keep and gateway, and occupying the neck of the peninsula between the castle and the town. Of this ward there remain only traces of the *enceinte* wall, and a fragment, probably of the outer entrance, between the keep and the town.

The east ward may be a little later than the rest. It is in plan a sort of half oval, the chord of 55 yards being applied to the curtain of the main ward, and the long semi-diameter of 80 yards descending the slope. The object of this enclosure, at present called the cockpit, was to occupy what would otherwise have been a convenient post for an assault, and to cover the postern which opened in the main curtain near the south-east angle, and whence a path led down to another gate in the east ward wall into a ditch which served as a covered way to the river. The wall of this ward is less solid than that of the main ward, and may have been an addition, though probably an early one. It not only covered the postern, but afforded a safe access to the castle mill, and stood to the south-east between the castle and the river, at a point where the river makes a sharp turn, and where a reef of rock supplied an effectual and inexpensive weir. The church mill has a weir of its own, and is about 200 yards lower down the stream.

Although the keep is placed at the northern point of the main ward and upon the *enceinte*, it stands mainly on the north ward, and is placed where it could most effectually oppose any attack on the town side. It is in plan rectangular, 56 ft. east and west, by 48 ft. north and south, and about 100 ft. high. The walls at the base are about 11 ft. thick, and are reduced by two sets-off at the level of the upper floors. It has the usual characteristics of a Norman keep, though with certain peculiarities. At the base are the usual footings suited to the irregular levels of the ground, but from these the wall rises quite plain about 10 ft., nearly to the level of the first floor. Here, from this stage as a plinth, rise the usual broad flat pilasters, one at each end covering the angle, which is solid, and supporting the usual four rectangular turrets above. These, however, are peculiar, in that the pilasters cease at a string which marks the base of the parapet of the curtain. Above this the outer half of the pilaster is continued as a narrow strip, which dies into the wall of the turret at the base of its special parapet.

On the north and south, or wider fronts, two pilasters, somewhat narrower than the flankers, intervene. On the east and west faces there is but one, and that a much narrower one, in the centre. These are all stopped by the string at the base of the parapet. Besides this string, the tower has exterior indications of its several stages. The first floor is indicated by a bold half-bead carried round the three outer faces of the keep. At the level of the second floor is a set-off of about 6 in., and a similar one marks the level of the third. These are continued round both walls and pilasters, reducing the wall by about 1 ft. in thickness, and probably the modern floors conceal similar sets-off within. There is one other peculiarity. The south or inner front is not so wide by about 6 ft. as the north, and the east front is 4 ft. less than the west. This is caused by a recess, or rather a nook or hollow angle, occupying the south-east angle, and measuring 6 ft. by 4 ft., in which, at the first-floor level, where the recess begins, is the entrance-door. The base of the parapet and lower part of the turrets seem original and of Norman date; the embrasures both of turrets and curtain are probably modern. One turret, at least, has the original Norman doorway opening on the rampart. These turrets had a first-floor, as was usual, the holes for the beams of which remain. The basement and the two lower floors are of excellent ashlar work. The upper floor is inferior, though sound work. It is of different date.

The inner or southern face differs considerably in its basement from the rest. Here is a large, lofty, round-headed archway, of 11 ft. opening, plain, but with recesses for two flanking columns, nook-shafts, on each side, inside and out, with ornate capitals, eight in all, and a very bold rebate, showing that the doors opened outwards, a fact corroborated by the position of the bolt-holes. Moreover, the whole of this basement face is of very rough rubble. It is clear that here was a low building against the keep, part of its original design, and that this archway opened from the basement of the keep into an exterior chamber, now removed, probably with a small exterior doorway.

Originally the floors were all of timber, and no stair in masonry connected the basement with the floor above. The well, of the date of the keep, was central, as at Conyngsborough. In the Decorated period, a large, strong, eight-sided pier, upon a square base, was built over the well, which is reached by means of a lateral arched recess in the east face of the pier. From the four main faces of the pier spring four ribs dividing the chamber into four bays, each of which is also ribbed diagonally with cross springers, plain, but producing an excellent effect. The wall shafts are half octagons with square bases. This chamber is 35 ft. by 19 ft. It has no lights, vents, or recesses. In its south-west corner, barely touching the wall, is built a thin cylindrical shell of masonry, containing a spiral stair, which ascends to the first floor. The door of this is to the north-west, and it is lighted by a loop to the east, both opening from the chamber in which it stands. This staircase is an addition, probably of the date of the vault. It is now disused and closed at its upper end. Probably it always stopped at the level of the first-floor. This is a curious example of the conversion of the basement of a Norman keep into a late Decorated chamber. The first-floor of the keep of Brougham has undergone a similar change.

The regular and original entrance to the first floor of the keep is by a square-headed door of moderate size, flanked by worked columns, now gone, which supported a round-headed recessed arch. This door is in the south face, close to the east end, in the hollow angle before described, and it is entered from the ramparts of the *enceinte* wall. It opens into a lobby in the wall, 9 ft. wide, and on the left a small door opens upon an ascending flight of stairs, and a second, about 4 ft. 6 in. wide, opens direct into the first floor. This floor is of the same dimensions with that below. It was the state-room. It has three windows in the north wall, of about 1 ft. opening, round-headed. The recess in which each is placed has but a slight splay, from 3 ft. at the window to 4 ft. 6 in. in the chamber. These are flanked with detached columns, and above is a plain slender dripstone. The recesses rest upon a string-course, embattled or billeted along its under side. These windows, on the outside, are also flanked by columns and furnished with dripstones. There is also a door in the south-west corner of the room, which leads by an oblique passage into a small mural chamber, which opens by a large round-headed door, or window, of 7 ft., opening on the west face of the keep, at the level of the contiguous curtain. The present opening has been restored, but, no doubt, represents an old one, though for what purpose intended is difficult to say. A loop here would have raked the curtain in safety, where this opening, quite within reach of a short ladder, would be very dangerous. It is, indeed, possible that the original opening was a loop, lighting a small garderobe. The spiral stair, now closed, must have opened just in front of this door. There is no visible fireplace. In the centre of the room, over the lower pier, is a cylindrical pier of rather smaller dimensions, about 3 ft. diameter, and broken off. This may have been intended to support a vault, of which, however, there are no traces on the walls. This floor is or was filled with the trowsers of her Majesty's militia, and therefore is only allowed to be inspected through a grated door, even by those who are fortunate enough to be allowed to see the keep.*

G. T. C.

RECENT ALTERATIONS AT THE TOWER.

"I pray you let us satisfy our eyes
With the memorials and the things of fame
That do renown this city."

THOSE who have allowed some months to elapse since their last visit will find important alterations in several portions of the Tower of London. With one or two exceptions the changes made tend to remind us that the Tower once possessed the three-fold character of fortress, palace, and prison. There is, then, the greater pleasure in recording them at a time when, as now, the historical features of our city are rapidly disappearing before the pickaxes of Utility and Improvement. Taking first in our survey the parts which are commonly shown to the public, there will be missed the popular long line of armed figures which formed so remarkable and beautiful a display in the Horse Armoury, and the Queen Elizabeth's Armoury in the White Tower, with its popular attractions of the beheading-block and thumb-screw, the Skevington's gyves (scavenger's daughter), and the axe which forcibly appealed to even the most illiterate. From the earliest ages the Tower has formed the principal place of deposit for the national accoutrements and arms. In the year 1213 Geoffrey de Mandeville was commanded to surrender the Tower to the royal authority, "the arms and other stores being therein." King Henry III. issued a mandate to the Archdeacon of Durham to transmit hither "twenty-six suits of armour five iron cuirasses one iron collar three pairs of iron fetters and nine iron helmets," which the preceding monarch had left in his charge. During this and the two following reigns similar writs occur. In the year 1399 John de Flete, Keeper of the Arms in the Tower, was ordered to buy and provide as many "espringalls quarrells hauberks lances arbalasts bows and arrows," as were necessary for the defence of Southampton Castle. Two years later the Sheriff of Gloucester was called upon to purchase and send to the Tower 1,000 bows and 300 sheaves of arrows. Of the reigns of King Richard II. and his successors up to King Henry VIII. many interesting documents exist relating to the warlike stores contained in and issued from the Tower. More notable, however, is the inventory taken in the first year of King Edward VI. Here† we find described several of the articles comprised in the present collection; as, for instance, the brigandines with coloured silk and satin sleeves,‡ the "Targetts steilde with gonnes" (being round shields with pistols in their centres), the "Holly water sprincle, with three gonnes in the topp,"—since labelled as "King Henry VIII.'s walking-staff," and the like. Paul Hentzner the German traveller who gives us so vivid a picture of London in Queen Elizabeth's time, describes his inspection of the Armoury, mentioning several of the still most popular exhibits,—such as "spears out of which you may shoot, shields that will give fire four times, a great many rich halberds, commonly called partisans, with which the guard defend the royal person in battle, the suits of armour of Henry VIII., many and very beautiful armours as well for men as for horses, the lance of Charles Brandon, Duke of Suffolk, three spans thick; two pieces of cannon,—the one fires three, the other seven, balls at a time [these are the guns cast by

* To be continued.

† The inventory is in the possession of the Society of Antiquaries.

‡ The brigandine jacket, made by enclosing small squares of steel between two layers of canvas. This, with the morion, formed the body and head armour of the foot-soldier *temp.* Henry VIII.

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Peter Baude, who succeeded the three brothers Owens in the royal foundry at Houndsditch; the former gun bears 'Petrus Baude' near the breech] . . . . cannon for chain-shot and balls proper to bring down masts of ships," &c. It is to be carefully observed that Hentzner, writing ten years after the defeat of the Armada, makes no reference to a "Spanish Armoury" or to any arms taken from that fleet. Had a collection of this kind been made (and it is noteworthy that already the Tower Armouries formed one of the "sights" of London), it would certainly have been brought to the notice of one who would carry abroad the fame of such trophies. In a survey of 1668 made by William Legg upon his re-establishment in office as Master of the Armouries is scheduled a "Spanish coller for torture, taken in 1588," though this, the first mention of a Spanish trophy, is perhaps no less fanciful than the assignment in a preceding item of the complete suit of plate armour to John of Gaunt. Yet Legg's inventory is highly curious as containing the earliest account of the mounted figures,—then ten in number,—described as "sundry compleat armours and others whereof some of them [*sic*] were standing formerly at Greenwich [the royal palace of Placentia], in the greene Gallery there." They were all mounted on "horse statues of wood," and ascribed to various sovereigns, the Earl of Leicester and Charles Brandon, Duke of Suffolk, though our faith is somewhat shaken when we read of a suit of white, *i.e.*, plate armour, for William the Conqueror.* In this document the so-called "Spanish Armoury" has no place; though in an inventory of date 1675 we read for the first time of a "Spanish Weopon-house." The name is manifestly derived from the detailed contents of the building where whilst we have Danish clubs, Venice targets, English javelins, Dutch half-pikes, &c., the weapons distinguished as Spanish largely predominate in number. Nothing is said of the latter being *spolia opima*, and the term Spanish clearly applies to their fashion or manufacture. In the Weapon-house, which stood to the east of the now Guard-room by the Wakefield, or Record, Tower, we first discover "King Henry ye 8ths walking-staff," and among the items the armour attributed to De Courcy,—

"Armour cappape of ye Lord Corseys white and parcell guilt."

Also, the "Champion targett and launce of King Charles II.," and "Old wooden shields, whereof two said to be King Henry the 7ths, and the other Charles Brandons, Duke of Suffolke."

About this time armour falling into disuse the stores were returned into the Tower by the different corps of the army and have never since been called for. Particulars of the stores are set forth in the rough draft of a survey made in 1697. It opens with an imposing list of "Harquebus Armor Ordnary," followed by others of "Harquebus Strong," "Curasiet Armor," "Footman's" and "Toiras Armor": these include "Backes, Brests, Head Pieces, Dutch Potts and Potts made in England."† It would seem that the equestrian figures remained as before, though this cannot be exactly ascertained, a portion of the paper being torn away. There are specified, however:—

"Statues of wood whereon s[re] faces ij carved 2
Horse statues of wood ..... 2"

These are the work of Grinling Gibbons, the "faces" being those of Kings Charles I. and Charles II.; both are in the Tower, but the head of the latter is transferred to King James II., on the equestrian figure which represents him in the cuirass and the casque, with oreillettes, which he wore at the battle of the Boyne. Augmented, probably, by a few others subsequently sent in from out-stations, the stores enumerated in the two inventories of 1675 and 1697 furnished the additional embellishments to the existing Armouries. The mounted figures were increased from ten to twenty-seven in number. The "line of kings," as it was termed, began with our old friend William the Conqueror in his impossible suit of plate armour, and finished with the Kings George I. and II.; George I. appearing in the suit of Sir Henry Lee, the veteran champion of Queen Elizabeth; and George II. in that of Edward Clinton, Earl of Lincoln, A.D. 1535. King Edward I. masquerades in gilt armour, and James I. in a tilting suit that indubitably belonged to Robert Dudley Earl of Leicester; whilst King Henry VIII. was encased in John of Gaunt's. A figure clad in a beautifully-arabesqued English suit of russet armour of King Edward VI.'s time, bestrode a horse encased in a suit, embossed with the striking-iron and pomegranate,—the badges of Burgundy and Granada,—which was presented by the Archduke Philip of Flanders to King Henry VII. The group was shown as Edward the Black Prince. Moreover, by way of anti-climax, King Henry V. had exchanged to William III. the suit he wore at Creçy for one made up of those belonging to Kings Charles I. and Henry VII. Absurdities of this kind leading the less well-informed to picture to themselves the heroes of Senlac as men-at-arms of the Tudors, cavaliers as equipped for the Wars of the Roses, were rendered more obvious upon the appearance of Sir Samuel Meyrick's "Critical Inquiry into Ancient Armour." His advice and co-operation were secured; in 1826 the ancient Cold Harbour Gate was removed, and a Horse Armoury built against the southern wall of the White Tower. At the same time the misnomer of Spanish Armoury yielded to the title of Queen Elizabeth's Armoury, since most of the latter collection was made during the sixteenth century. John of Gaunt, De Courcy and others were taken down from their wooden destriers, Sir Samuel Meyrick reclassified the various exhibits, and in the year 1869 at the hands of the late Mr. Planché the whole collection assumed the shape which is familiar to most of our readers. It will be remembered as conspicuous for the picturesque line of horsemen ranged beneath the house colours of the several dynasties, the two coloured wood-carvings, known as "Gin" and "Beer," on the staircase,—relics from the Greenwich Palace buttery,—and for the tawdry, Tussaud-like group of Queen Elizabeth and a page, which stood in the Queen's Armoury facing the stairs made through the eastern wall of the White Tower. She is represented as riding to St. Paul's to offer thanks for the defeat of the Armada, though she was carried thither in a coach,—one of the first seen in England.

The two armouries are now being regrouped in the Council Chamber and room forming the top floor of the White Tower; but the old order is destroyed owing to the shape of the two new show-rooms. The vestibule communicating with the Horse and Queen's Armouries, which was built in 1851 after the plans of W. Stacey, Ordnance Store-keeper, is happily demolished. By the removal of the panelling, with other changes, its original condition is restored to the upper crypt of St. John's Chapel (Queen Elizabeth's Armoury). It is in the north party-wall of this apartment that the dark chamber is built known as the "Little Ease," and shown as the bed-chamber of Sir Walter Raleigh. Made a captive on three several occasions, his second and longest imprisonment extended over sixteen years. During this period the brightest jewel of his sovereign's crown was confined in the Bloody Tower,* and here his son Carew was born. Here, too, whilst engaged upon chemical experiments and his "History of the World," he received the visits of his friends including Ben Jonson, and the Prince Henry who averred that no man but his father would keep such a bird mewed in such a cage. He would work and cultivate rare plants in the adjoining Constable's garden; the narrow walk upon the wall connected with this tower, by which the murderers Miles Forest and John Dighton approached the princes, is yet styled Raleigh's Walk. The second crypt of the chapel is also cleaned and opened to inspection. Below the ground level, it is entered through the dungeons into which More and Fisher,—shortly to be canonised by the Roman Church,—were thrown, and where remain traces of the rack that tortured Anne Askew, Guy Faux, and the coin-adulterating Jews.

Visitors now enter the chapel by the flight of steps made in the southern wall of the White Tower, at the foot of which the remains of the murdered princes were found. A well, in good preservation, has just been discovered within the keep, by the south-western turret.

Along the eastern side of the White Tower, adjoining the circular turret, once occupied by Flamstead, there formerly stood a large storehouse, flanked with two castellated buildings of Edward III.'s time. The area between the White Tower, the Wakefield, Salt (Assault) and Broad Arrow Towers was occupied by the palace, its gardens and offices. The Queen's private lodging and garden adjoined the Salt Tower at the south-eastern angle of the Inner Ward; the Queen's Apartments and Gallery lay to the west, their site now occupied by the doomed Ordnance Buildings. In the middle space near the Wardrobe Tower, King Henry III. erected his banqueting-hall; another large hall abutted on the Wakefield, for some time termed the Hall, Tower.* In this, the favourite palace of the Plantagenets and Tudors, John, King of France and his son Philip, entertained their conqueror. Another royal captive, Charles Duke of Orleans, father by his third wife of Louis XII., wrote here the English poem which, preserved in the British Museum, contains the earliest known view of the Tower. Hither Bruce, King of Scotland, was led prisoner by Edward's heroic queen; and here according to Froissart, Richard II. resigned his crown to Bolingbroke: though this episode is by some laid in the Council Chamber of the White Tower; by others, in the Refectory, now the scholars' dining-room, at Westminster. From the scene of the magnificent wedding festivities of Eleanor of Provence and Henry III., the daughter of Edward IV. and queen of Henry VII. started to be crowned in the Western Minster; and here the brides of King Henry VIII. were royally received. In the Great Hall was arraigned his second victim, who but three years before had landed from Greenwich at the Water Gate, "amidst the great melody of trumpets and divers instruments, and a mighty peal of guns." In the palace she, whose name is carved in the prison-lodging of the Beauchamp Tower, lived a nine days' Queen, and her successor kept court. Well might Elizabeth, passing the Bell Tower on her entry as queen, alight from her horse and reverently thank God for her past deliverance from its cell, and refuse to make that a palace which had been her prison. At the coronation of King Charles II. was observed for the last time the ancient custom, established by Henry IV., of proceeding in state from the Queen's Stairs to Westminster. For this occasion they made the St. Edward's crown to replace that of the Confessor broken up by the Commonwealth men. This is the crown which Blood nearly succeeded in carrying away, and was used at each subsequent coronation except that of her Majesty. The Regalia is now deposited in the Wakefield Tower, where a case containing the insignia of the Thistle fills the recess in which King Henry VII.'s body was found. After Charles II.'s time the palace fell into disuse as a royal abode; the southern precincts were occupied by a large storehouse which, burnt in 1789, made way for the huge and unsightly structure now being demolished. So desirable a measure accords with a scheme of the late Prince Consort for restoring to the Tower and its precincts somewhat of their ancient character. In a few weeks the remains of the Lantern Tower and Inner rampart beneath the Ordnance-house will be brought to view. The central keep should stand forth in solitary grandeur no longer for the awe but for the admiration of citizens. It is to be hoped that the guard-house with the unsightly Horse Armoury will not be spared, and that we may thus regain the former prospect from the river of that White Tower where Gundulph laid in tears the foundation of a fortress which was to be the scene of so much suffering.

Other modifications harmonise but ill with the time-honoured associations of the Tower. The warders (officially styled yeomen gaolers and porters) no longer wear the picturesque costume of the Yeomen of the Guard to King Henry VIII. That dress was secured for them by the Duke of Somerset on his release in the reign of King Edward VI. in recognition of their "dayly and diligent attendance." The garrison chapel, dedicated appositely enough to St. Peter in bonds, is denuded of its galleries and high-backed pews; two old entrances are filled in, plaster and stucco are laid about with no illiberal hand. In the course of excavations four or five years ago some deal boxes were disinterred, containing remains of state victims. Across the nave floor lay a body pronounced by competent judges to be that of a woman advanced

* Plate armour was not worn before the end of the fourteenth century.

† The harquebus (*hakenbüchse*) survives in the modern cavalry carabine, worn, until the new drill, slung from the shoulder-belt. The pot was the helmet of the pikeman.

* In the room, now subdivided, on the second floor being that in which the two sons of King Edward IV. were murdered. This was known as the Garden Tower until the middle of the sixteenth century.

* The lower portions of the Wakefield, St. Thomas's (Traitor's Gate), and Salt Towers are of William Rufus's time, and are splendid examples of early masonry.

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in years, being, in fact, the venerable Countess of Salisbury, last in whole blood of the Plantagenets. Close by they discovered the bones of a man of great size and stature, answering to the description of John Dudley, Duke of Northumberland, father-in-law to Lady Jane Grey. It was at first doubted whether this was really he, since the head was found as well, but a search in the Tower records showed that in his case the usual exhibition of the head at London Bridge had been dispensed with. Next to Dudley, and near the altar beneath which the Duke of Monmouth is buried, lay the relics of an arrow-chest containing the mouldering skeleton of a young and delicately-fashioned woman. Careful scrutiny demonstrated that here was the "lyatel necke" which Anne Boleyn told the headsman would give him small trouble. The remains were placed in leaden caskets labelled with the names of their respective owners. But the chapel as now restored and refitted has a cold and untoward aspect opposed to the emotions which its history justly inspires. Something more becoming than an ugly heraldic pavement emblazoned in black and white marble could assuredly have been devised to indicate their last resting-places whose diverse lives and common fate illustrate the oft-pointed moral of fallen greatness and blighted fame.

W. E. Milliken.

BELOW BRIDGE BRIDGES.

The reports of the City Architect, and of the City Engineer, on the question of the below-bridge passage of the Thames, have been issued, we learn. In one point these gentlemen agree with the Engineer of the Metropolitan Board of Works,—but in one point only,—they think a crossing is desirable. As to that, in the abstract, perhaps, few persons will differ. The difficulty arises when we come to discuss the method, and to count the cost. As to this, the ratepayers may certainly be advised to insist on an accord being arrived at among the engineers before they are pledged to pay a single penny.

The City advisers hold with ourselves that the difficulty of the approaches to either a high-level bridge or a tunnel are so great that it is not to be expected that any traffic, in any way proportionate to the cost of the new viaduct, would cross it. Each gentleman advises a bridge on the ordinary level,—one thinking that it should be a swing-bridge, another that it should be a bridge pure and simple,—wharf-owners being compensated for the keeping masted vessels below it. On this we have not the data at the moment for forming any opinion. We have no doubt that much more traffic would cross a swing bridge than a high-level bridge, and that, again, much more would use a permanent bridge than a swing bridge. But before saddling the ratepayers with millions of money, these points ought to be taken out of the province of opinion into that of statistical fact. We recently showed the results of one mode of arithmetical calcula applied to the subject. Why not carry the same investigation a little further? Above all, why not tell us what use was made of the steam-ferry, and what is the number of passengers now using the two existing tunnels? It is a significant fact that no notice is taken of these points by the Metropolitan Board of Works. The confidence which those authorities entertain that the ratepayers *must* find, without demur, such sum as they may demand, for such crossing as they may prefer, is strikingly shown by the use made (as we before mentioned) of the returns actually made. The case put forward by the Metropolitan Board of Works for a new bridge is based on the erroneous assumption that out of 384,000 pedestrians who cross fourteen metropolitan bridges in a day, 332,000 go over Hammersmith, Battersea, and the intervening bridges. A slip of the pen, no doubt, only it is on this very slip that the argument in favour of a vast outlay is based. Sir Joseph Bazalgette has not availed himself of the opportunity afforded him by our former remarks to give any explanation of his figures. We take it for certain that Mr. Jones and Mr. Haywood have something definite to show in the way of figures; but we are anxious to have the real and full statistics of all the attempted eastward portions of the Thames brought before the world.

And here we must say that we think the public are entitled to demand an accord among experts before they part with a penny. Three advisers counsel three different modes. If a fourth were called in he would probably be strong for a tunnel. Much as we admire the independence of the engineers of this country, we cannot but think that it would be better in such a case to adopt the Italian method, and to decide by a council of experts on the main features of a new engineering project, than to let every man fight for his own hand, so that, out of three professional men, no two agree on any point, except that the proposals of the third are totally inadmissible. As to this, every pair agree as against every third.

If it be not thought worth while to do the best that can be done with a steam ferry, while the engineers are making up their minds as to the best mode of crossing, it can only be because there is a shrewd guess that the small use that would be made of the ferry would be conclusive as to the small use that would be made of the bridge.

A HISTORY OF WALL PAPER.

The seventh exhibition of the Central Union of Arts applied to Industry has conveyed some useful facts to the minds of the public with respect to the trade and manufacture of wall-papers. The Central Union is making every effort to do for French industry what South Kensington has achieved in England. Its organ, the *Revue des Arts Décoratifs*, basing its observations on this year's exhibition, held at the Palais de l'Industrie, gives us a good insight into the development of this trade throughout France. Without, however, going into all the elaborate details spread before us in the course of this lengthy and technical history, there are a few facts that may be of interest to English readers. First, we could not but note that the foundations of this industry were laid by Englishmen. Great and just as is the praise which has always been accorded to France for her skill in applying the arts to industry, we must in our own honour recall the French proverb, *Ce n'est que le premier pas qui coûte*. This "first step," though the most difficult of all, was taken by an Englishman, at least, so far as Paris is concerned. The manufacture of wall-papers was commenced at a comparatively recent date in France. The first record is that of a factory established at Rouen, in 1610, by Le François; but this was combined with the printing of pictures and the illumination of vellum, parchment, &c. Traces of wall-papers are to be found at Lyons, Orleans, Macon, and other towns, but these are not typical of a *bonâ fide* industry. They are isolated cases, where certain persons unable to imitate the Paris fashion of painting the walls of their houses, pasted paper of a more or less decorative character over them. The people who supplied such paper did not make a regular trade of the article. It was looked upon as an exceptional contrivance, adopted by a few persons whose means did not allow them to use paint, according to the fashion. But in the *Géographe Parisien* of 1769 an announcement will be found, to the following effect:—"An Englishman, Mr. Lancake, has obtained from the king the permission to establish at Carrière, near Paris, a manufactory of wall painted paper, of painted prints for furniture, and all sorts of tissues. The general warehouse is in the Rue Saint Antoine, opposite the stores of Geoffroi-Lasnier, and the public will find the wherewithal to satisfy its taste."

Some years later another similar advertisement will be found in the *Almanach du Voyageur à Paris*. This time it is the firm of Windor, Father, Son, & Co., who announce that they have undertaken to manufacture papers for covering walls, reproducing some of the finest arabesques of Italy, and others, we are told, are elaborately gilt, and all very handsome. The initiative thus taken, French manufacturers were not slow to follow the example; and, by applying their knowledge of art and their innate good taste to this new product soon won a high reputation. Political events also contributed to give publicity to the new trade. M. Réveillon, a manufacturer of wall-paper, who is described by M. Thiers, in his history of the French revolution, as having created, by dint of his industry and ability, "vast workshops where he was perfecting the national manufactures and gave employment to 300 workmen, was accused of seeking to reduce by half the salaries he was in the habit of paying." The rest of the story is familiar to readers of history, who know that the murder of M. Réveillon, the sacking and burning of his house on April 27th, 1789, was one of the first acts of violence on the part of the mob which heralded the coming revolution.

Réveillon was certainly one of the first, and evidently at that time the most successful, of paper-painters; but his name and the nature of his trade will ever be associated with the record of the first outbreak of revolutionary violence. Many specimens, fortunately, still remain of his work. They are distinguished by their life, gaiety, elegance, recalling at times the Pompadour stuffs. By his papers he replaced the panelling, frieze, and other decorations, and secured, for this purpose, the services of the most talented designers of the day, such as Desrais, Prieur, Jean Baptiste, Fay, Huet, &c. By obtaining the collaboration of these artists, he disarmed opposition; no one could say that his papers were not most artistic. One of Réveillon's papers, printed in 1788, and designed by Prieur, is especially graceful, and all students of this subject will be particularly gratified to find that such precious relics have been preserved by *L'Union Central*. Réveillon was succeeded immediately by Jacquemart, who at first imitated his predecessor; but he had soon to yield to the influence which the painter David exercised over art. Like all the other sections of society, he had to sacrifice to the Greeks and the Romans.

Dufour, from Macon, who had followed the traditions left by Réveillon, came to Paris in 1807, but he was overcome by the bad taste that prevailed during the Imperial *régime*, and his productions were cold and pretentious,—more heavy than imposing. Some curious specimens of this artistic decadence are exhibited. The bad taste, after all, was but in harmony with all the surrounding circumstances; the firm was capable of some good work, as illustrated by a design dated 1814, drawn by Lafitte, painted by Madère, representing Psyche sacrificing to Venus. There are also some good specimens of the work of the firm of Cartulat-Simon, that existed from 1809 to 1835.

In 1830 a revolution was at last accomplished in this trade. Dauptain junior, whose father had founded an important firm in 1811, had the courage to abandon the stiff and unpleasant styles of the Empire and Restoration. In their stead he introduced a great variety of styles. The artist Martin supplied him with Arab and Moorish designs; then Aimé Chenavard gave him a number of comic sketches; while Poterlet brought his brilliant and quick imagination to the service of the firm. Stuff, documents, illuminations of the Middle Ages, the Renaissance, the seventeenth and eighteenth centuries were eagerly disinterred, and even Pompeian art was freely copied. As, at the same time, the means of manufacture, the mechanical appliances, the size of the workshops, had all been greatly improved, the firm was fully able to suddenly carry out these great changes. M. Dauptain had also carefully studied chemistry, and hence science, industry, and art all combined to rid France of the incubus that had weighed on it so long. This proved a death-blow to the Imperial style. The wall-papers of Dauptain soon acquired the highest reputation, and every firm sought to imitate his bold initiative. He had succeeded in creating a new school. After Dauptain came the artistic struggles between the rival firms of Délicourt and Défossé, to which the enormous progress achieved by this industry from 1850 to 1860 may be in the main attributed. In the wake of these valiant champions followed Genoux, Bezault, Riollot, and many others.

From a technical point of view, there are two dates which are landmarks in the history of this trade. In 1835 the continuous or endless sheet of paper was invented, and in 1852 the machine was introduced. By these two inventions the cost of production was reduced to an unhoped for extent. In a country such as France, where wealth is more evenly diffused and large fortunes are comparatively rare, cheapness is especially essential. At the same time, art is not improved by the cramping influence of machinery. Great, therefore, have been the disputes that have arisen as to the evil influences resulting from the use of machinery. It is urged that art is murdered by the bad taste introduced by mechanical processes. On the other hand, the manufacturers argue that purchasers would be repelled if the trade did not avail itself to the full

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of all the advantages derived from modern appliances. Unfortunately, both these arguments are true, and unless the manufacturers display great public spirit, and some disinterestedness, the trade is likely to degenerate. True artists must be employed in the work, and they must seek by ingenious contrivances to impart to mechanical production an artistic stamp. Art for art's sake is but a hollow cry when applied to the decorative arts; for art is of little practical value unless it can be made to apply to the things of everyday life.

By the aid of such exhibitions as those which have just been held, this end will be more readily attained; and the display of specimens of the best work, from the earliest record of the trade down to the present day, must be of great and suggestive value to designers, artists, and manufacturers.

ICONOCLASTIC VANDALISM IN FRANCE.

Whenever there has been a change of dynasty or alteration of the form of government in France, one of the first "reforms" to be carried out has ever been the changing of the names of a considerable number of streets in the principal cities of the country. Any *rue, avenue*, or *place*, bearing a name derived from the leading personages or events connected with the *régime* last abolished is re-christened with a title agreeable to the form of Government which has displaced it. Proceedings of this sort are childish enough, but they do little or no harm. They are calculated to raise a smile of contemptuous pity on the countenance of an impartial observer; but except as being comical manifestations of a kind of feminine spite and undignified bitterness unworthy of a great nation, such incidents do no permanent injury. But the deeds of the Commune, the throwing down of the Vendôme Column, and the application of petroleum to the destruction of some of the finest buildings in Paris, are only the outcome of a more virulent form of the same spirit of barbarous ignorance and malice. Against any repetition of these acts of violence it is but natural that every lover of art and architecture throughout the world should raise his voice in indignant condemnation. The events which have been taking place recently in connexion with the agitation among the mining population of Montceau-les-Mines and the anarchists of Lyons, unfortunately show that a certain political party in France is still capable of the most atrocious and savage acts of Vandalism. The anarchists with their dynamite have proved themselves not only enemies of architecture and art, but of human society itself. This latter part of the subject we leave for others to deal with. In these columns we must be content to record some of the facts which have come to light in proof of the iconoclastic mania of the newest school of French anarchists. At Montceau-les-Mines, the Vandalism of the agitators was directed against such images of the Virgin and such representations of the Crucifixion as they could lay hands on. These objects, it turns out, were first bored with regular blasting instruments and then shattered to pieces with charges of dynamite. With respect to the outrage in Lyons, where the anarchists employed dynamite to blow up a *café* resorted to by persons whom they disliked, it has been shown that the act had been contemplated for some time, and was in fact, foretold in one of the revolutionary organs more than six months ago.

That such deeds of barbarism can be perpetrated even by the very lowest class in France is a fact of the greatest gravity. But there are those belonging to higher classes who are hardly less guilty than the most violent of the extreme revolutionaries. It is a fact that for some time past many men among the more respectable sections of the Republicans have been urging the Government to undertake what has been called a "purification" of the public statues throughout France. These more moderate Republicans desire to have their own heroes honoured in this form, but not content with obtaining permission to erect statues to those whom they admire, they demand that the authorities shall remove or destroy all the monuments erected to the heroes of the Royalists, Legitimists, Orleanists, and Bonapartists. The Republicans, as we have above hinted, have already substituted Republican for Royalist and Imperialist names of streets, roads, and places. Now they go further, and for a couple of years past they have been importuning the Minister of Education to do away with any statues except those whose originals the parties at present in the ascendant recognise as having been patriots.

Hitherto the Government has not given way. But the question is, will it be able, in the long run, effectually to resist the importunities of its supporters? There are about three thousand public statues in France, and three-fourths of these even respectable Republicans wish to have thrown down and destroyed. As the Ministry has not yet made up its mind to yield to the iconoclasts, the mob is beginning to take the work into its own hands. Some time ago an attempt was made to blow up the statue to Thiers at St. Germain. Soon after, the fountain of St. Sulpice, which is adorned with figures in stone of France's greatest pulpit-orators,—Fénélon, Bossuet, Fléchier, and Massillon,—was threatened with destruction. Upon the fountain the agent of a secret committee had written the sentence passed by that occult organisation condemning all these figures to destruction by dynamite, and the fact that this has not yet been carried out is solely attributable to the unceasing vigilance of the police. On the other hand, in some quarters the authorities have been, to a certain extent, yielding to the narrow prejudices of the iconoclasts. Thus the *Maire* of Caen caused the statue of Louis XIV., which stood on the Place Royal, to be removed. Fortunately, in this instance, the outcry of the local opponents of the act was powerful enough to induce the *Maire* to refrain from destroying the statue, and in ultimately compelling him to set the statue up again in a less prominent spot. Again, the Town Council of Marseilles has passed a resolution requiring the removal of the statue of Bishop Belzunce. The decision has met with no opposition. It is attributable purely to a blind hatred of everything connected with the Church and priesthood. The fact that Bishop Belzunce has had a statue erected to his memory, chiefly in consequence of his heroic self-devotion to the wants of the Marseillais victims of the terrible plague of 1720, has had no weight with the fanatic anti-religious and iconoclastic politicians of the present day.

When such is the conduct of official personages and corporations, the Vandalism of the ignorant and fanatical anarchists of Montceau-les-Mines is hardly to be wondered at. Altogether, for the lover of art, the present state of feeling amongst large classes of Frenchmen with regard to their national monuments is one of the most depressing facts of contemporary history.

THE USE AND ABUSE OF SCREWS IN WOOD WORK.

Archimedes is credited with the invention of the screw, but whether the famous geometrician's labours extended much further than the enunciation of the scientific principles and the mechanical power of the screw, it is difficult to say. If he made a screw, he certainly must have tried its effect, and was probably well satisfied with its performance, for in the whole range of mechanical appliances in the constructive arts there is not a more useful article than the screw. Archimedes is further reported to have said, "Give me a prop, a position, and a lever strong enough, and I will move the world," and, no doubt, if these conditions could be granted to him, he, as well as others after him, could lift the earth, or aught upon the earth, by a combination of the tremendous lifting and driving powers exercised by a series of screws, apart from the lever. Screws are various, and of various sizes, forms, and materials, but the same principle runs through them all, whether they be manufactured for use in metal or woodwork, or for exerting a lifting, driving, or pressing power separately. Our object here is not to treat of screw-cutting, but rather screw-driving in woodwork, and to throw out some useful hints to the building constituency, and particularly workmen. The use and abuse of screws is a matter of importance to architects, builders, and their clients, for it is according to the way screws may be applied in several building and kindred operations that good or bad workmanship will be evidenced.

Screws are more extensively used than formerly in putting together various kinds of wood framing, and even in cabinet and chair work screws are pressed into service in places where their use would not have been tolerated by manufacturers in the earlier portion of the present century. Although their existence is generally concealed in furniture and fancy work, they are often present, nevertheless, and too often they are used as a substitute for dowels, dovetails, and tenons, in the manufacture of cheap work. It is an instructive and remarkable fact that our building workmen of a century or two back, in many operations in carpentry and joinery, discarded, as far as was possible, the use of nails or screws, depending more on carefully-jointed work, put together by means of mortise, tenon, dovetail, hard-wood dowel, or oaken pin. Their work might have taken a longer time to execute than that done by our present race of joiners and woodworkers, but it was infinitely more lasting, and kept together so long as the timber or wood continued sound. The nearly universal remedy now for every broken article on the part of the jobbing joiner and cabinet-maker is to repair it with the aid of a nail or a screw. Glue is even often dispensed with, or used where it will exercise little sustaining power, and coloured putty is not only made to cover the heads of sunken nails and screws on the face of a piece of work, but used also to hide bad joints and workmanship. Some years ago the writer examined an old oaken staircase and hand-rail in a college, which work was executed more than two centuries since, and in the construction of which not a nail or a screw was used. From time to time, over long years, some slight repairs were made, but the workmen during their operations were never able to discover that a nail had been used in the original construction. There were mortises and tenons, grooves and tonguing, wooden pins or dowel work, but no iron fastening of any kind. The writer also examined more than one old roof in which the use of iron spikes, nails, and other iron fastenings was dispensed with, and the joining of the timber was effected without their aid. In the hinging of doors and other framework it is necessary to use screws, but, unfortunately, many workmen, if not watched or cautioned, will not do the screwing properly or in a workmanlike manner. In deal, pine, and other soft woods a bradawl is sufficient to make an opening for the screw, which opening, of course, should be less than the thickness of the body, and short of the length of the screws used. It will be found, however, that most workmen, not content with tapping the screw a fourth of an inch or so to give it a hold before applying the screw-driver, will actually drive the screw into the wood two-thirds of its length with the hammer. This the workmen will do to save themselves trouble. If there be two hinges upon a door, and if each hinge has eight screw-holes,—four in each plate,—the chances are that the workmen will drive half of the screws nearly home in the door-stile and frame with his hammer rather than take the trouble of driving them gradually home with the screwdriver. Hence, if the door be a massive or heavy one, the weight of it will tend to the hinges loosening, and after a time will follow a train of other ills,—the "dragging" and "rubbing" of doors, and their makeshift cure in what is known as "easing" them. If remonstrated with for driving a screw nearly home with the hammer, the workman may probably say (as some workmen certainly think) that a few turns of the screw in the wood are sufficient. This is an erroneous and mischievous idea. A screw that is nearly driven its whole length with a hammer cannot make a regular and corresponding thread or spiral in the wood, and therefore its binding and maintaining power in keeping the hinge in its place is all but gone. Workmen should be made to drive every screw home gradually with the screw-driver, and not only an odd one. In hard-wood operations as well as in soft woods, particularly in hinge work, screws should be properly driven, and the aperture or opening made for the passage of the screw should be much less than the thickness of the screw to be driven. The screw will bite a sufficient passage for itself. In hard wood, however, it is necessary to give a little more freedom of entry to the screw than in soft wood, and a gimlet is needed for making the suitable opening instead of the bradawl.

A difficulty is often experienced by persons who wish to withdraw a screw, by finding that though it will turn round under the application of the screw-driver, yet it will not unscrew

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out. In this case a well-grounded suspicion may be entertained that the screw in question was driven, or nearly driven, home originally by the hammer, instead of gradually by the screw-driver, and that no regular thread corresponding with the screw exists in the wood. Under such circumstances it becomes necessary often to wrench off the hinge or hinges by force, at the risk of their breaking, and this often happens. When hinges have lain undisturbed for long years on old doors or other framings, perhaps for a quarter of a century or double that time, it becomes difficult to extract the screws, although they may have been originally properly driven. This arises from the screws rusting in the wood and sometimes from other causes. Workmen themselves often fail to withdraw a screw, and are forced to break the hinge to enable them to get under the head of the screw, and wrench it out. They often split, and break too, fancy and delicate woodwork articles in their efforts to take off hinges, locks, mountings, and other finishings, despite that simple methods exist for extracting screws that have rusted in the wood. One of the most simple and readiest methods for loosening a rusted screw is to apply heat to the head of the screw. A small bar or rod of iron, flat at the end, if reddened in the fire and applied for a couple or three minutes to the head of the rusted screw will, as soon as it heats the screw, render its withdrawal as easy by the screw-driver as if it was only a recently-inserted screw. As there is a kitchen poker in every house, that instrument, if heated at its extremity, and applied for a few minutes to the head of the screw or screws, will do the required work of loosening, and an ordinary screw-driver will do the rest without causing the least damage, trouble, or vexation of spirit. In all work above the common kind, where it is necessary to use screws, and particularly in hinge-work and mountings, fancy fastenings and appliances affixed to joinery or furniture work, we would advise the oiling of screws or the dipping their points in grease before driving them. This will render them more easy to drive and also to withdraw, and it will undoubtedly retard for a longer time the action of rusting.

As matters obtain now in carpentery, joinery, furniture, and other wood workmanship, with regard to screws, although they cannot be dispensed with, yet it would be advisable in sundry classes of woodwork to minimise their use, and in other cases to do without them altogether. They can seldom be used with advantage to the displacement of mortise and tenon or good dovetail or dowel work. The growing practice of putting together woodwork with screws bespeaks a decadence of skilled labour, and of nails and screws there are far too many pressed into service in our workshops and dwellings. While admitting the usefulness of the screw in various ways, we have here endeavoured briefly to show its abuse in woodwork, and at the same time to afford some hints for better methods of procedure in building and kindred workmanship.

THE BRAZILIAN EXHIBITION AT BERLIN.

In the extensive apartments belonging to the Club House of the Berlin Architects an interesting exhibition of Brazilian products has recently been opened. The various collections present a vivid picture of the vegetable, animal, and mineral wealth of tropical South America. The walls are covered with the skins of panthers, pumas, jaguars, coatis, opossums, and ant bears, grotesquely or artistically grouped together, or combined with richly-carved Indian weapons, bows, arrows, and quivers, and various ornaments, such as necklaces of teeth, wooden combs, &c. There are also fine examples of Brazilian vegetation, including palm trees, giant grasses, mosses, and the great creeping plants of the primæval forest. In the more strictly commercial department of the Exhibition, the special section devoted to coffee is beyond question the most striking and important. Here we find a great pyramid, which illustrates in the clearest manner the total annual coffee production of all the tropical countries and the relative share of each. The base of the pyramid is a cube representing the grand yearly total, amounting to 615,711,200 kilogrammes. Immediately above this comes the block representing the proportion of the whole produced by Brazil, and amounting to 300,000,000 kilogrammes. Next come the Dutch colonies in the East Indies, and then Venezuela, Ceylon, Haiti, &c., each being represented by a proportional block rising one above another in diminishing scale. Another portion of the Coffee Exhibition presents us with the actual article itself, of which we find here no fewer than 200 varieties. Another section of the Exhibition is devoted to sugar, with specimens of the Brazilian sugar-cane and cane sugar. Close to this are samples of sugar, brandy, and rum, and further on the Paraguayan tea called *Cha do maté*. The exhibition of Brazilian timber and dye-woods is also very complete and interesting. Especially notable are the Ipé wood from Pernambuco and the cedars from Sao Bento. Other sections are devoted to different sorts of cotton, wines from Campo Bom, orange wine, malt, cocoons and silkworms, with some very beautiful raw silk, white and yellow, and a great variety of fruits and seeds. The department of preserved fruits is very extensive, and includes many varieties almost unknown in Europe. The section devoted to fibres adapted for spinning cord or rope-making is also very important. There is, in addition, an immense variety of miscellaneous articles which we have no space to mention, and among which we can only note the bricks and tiles of Pernambuco, and a complete earthenware stove from the latter place. An interesting collection of articles had been sent for the ethnological section, but many of them were lost through shipwreck on the way to Europe, especially a collection of primæval earthenware vessels. However, the Exhibition still shows a curious collection of objects of the Stone Age of the Brazils, including stone weapons, arrow and axe heads, as well as some stone plates. Altogether, the Exhibition is one of singular interest, and is well adapted to forward the object of the Berlin Society for the Study of Commercial Geography and of the Berlin architects, who have brought it together, viz., to promote the extension of trade between Brazil and Europe.

THE EXAMINATION OF PORTLAND CEMENT.

Considering the interest which the question of the adulteration of Portland cement has lately aroused, it will be useful to briefly quote a valuable article on the subject which appears in a recent issue of the *Annales des Ponts et Chaussées*. After an introduction in which reference is made to the importance of examining every description of cement before it is used, numerous analyses are cited, showing the composition and the causes of the hardening of cement, of which the following are the most noteworthy, as supplying a comparison between French, English, and German cements, viz. :—

a. French Cements.

	Lime.	Silica.	Alumina.	Oxide of Iron.	Sulphuric Acid.	Magnesia.	Water, &c.
First sample...	61·20	23·82	8·09	3·28	1·17	Trace	2·44
Second sample	60·85	23·70	9·83	2·75	1·00	Trace	1·87
Third sample	59·40	24·10	7·20	3·35	0·55	0·95	4·45

b. English Cements.

First sample...	61·72	23·07	8·55	3·25	1·45	Trace	1·96
Second sample	63·00	21·35	8·55	2·70	0·65	0·45	3·30
Third sample	58·29	20·56	6·20	6·76	1·62	0·32	5·79

c. German Cements.

First sample...	62·68	23·29	5·43	2·47	1·03	1·10	3·44
Second sample	63·21	22·82	2·69	3·52	1·12	3·00	3·95
Third sample	63·27	19·80	6·73	3·22	1·08	2·02	3·84

With the increase of lime up to a certain degree, the liability of the mixture to sinter declines, the hardening requires a higher temperature, the product gets harder, and furnishes a cement of greater resistance. A great value is to be placed upon the presence of magnesia, and the excellence of German cement is partly due to the higher percentage of magnesia, as seen from the above table. One of the most essential conditions of the successful production of cement is a careful composition of the parts. In this respect the German mode of manufacture is favourably referred to, and manufacturers are cautioned against leaving the composition to the practice and experience of the workmen. Wherever large quantities of cement are to be used, it is essential to inquire into the care exercised in the manufactories in the composition.

As regards the removal of the cement from the kiln, it is pointed out how necessary it is to keep the hard and badly-burned stones carefully separate; cement turning into a fine powder in cooling is totally unfit for use, and must be rejected. The cause of this disintegration is a superabundance of alumina. In order to save the mills, manufacturers employ a coarse grain for hard-burned cement; but a fine grain should be insisted on, because coarse pieces of hard cement act in the mixture like sand. In receiving and using cement, care must be taken that it is not too fresh. It is a mistake on the part of manufacturers to pack fresh cement at once in barrels or sacks. Cement, when finished, must be left exposed to the air for some time, in order to allow of the excess of quicklime to slake itself. English cement manufacturers pay great attention to this point, and leave the fresh cement spread in thin layers for some time.

The microscopical examination of cement with regard to its quality is highly recommended, because it enables us to discover foreign ingredients, especially the presence of blast-furnace cinder. But it is difficult to carry on microscopical as well as chemical examinations on building sites, independent of the consideration that it is impossible to recommend a certain composition as the best. It is to be recommended to examine cement for its weight and its density, for cements are proved to be better the denser they are. The difficulty of the examination consists in determining the comparative density of various descriptions of cement. In supplying the large quantities for the harbour works at Boulogne, the rule was laid down that the cement must contain no more than one per cent. of sulphate of lime. Further numerous data on the effect of the fineness of cement, practical experiments, determination of time required for setting, production of test pieces, experiments as to strength, and the effect of age on the resistance of cement, make the paper to which we have referred one of the most complete on the subject. The writer is M. Barreau, Ingénieur des Ponts et Chaussées.

THE ADULTERATION OF PORTLAND CEMENT.

In order to discover whether cement has been adulterated with blast-furnace cinder, 5 grammes of cement are put in a glass containing 50 grammes of diluted muriatic acid (one part of pure acid and four parts of water). To prevent parts of cement settling at the bottom, the mixture must be stirred with a glass or wooden crusher. Pure cement imparts a yellowish colour to the solution, without rendering it turbid. If, on the contrary, the liquid turns turbid (milky), from the presence of suspended sulphur, while, at the same time, the yellowish tinge disappears, and a strong smell of sulphuretted hydrogen (like rotten eggs) becomes perceptible, this is an indication that blast-furnace cinder has been added. Presence of ground limestone or chalk may be detected in a similar manner. If, on pouring the diluted muriatic acid on the cement, an ebullition takes place, it is a proof of the adulteration with those substances. The greater the ebullition, the larger the addition. Pure cement does not effervesce, because no carbonate of lime is contained in it.

THE EMPLOYMENT OF TERRA COTTA IN GRECIAN ARCHITECTURE.*

The remarkable advantages which antiquarian knowledge has derived from the explorations at Olympia have become more appreciable, since the termination of the work has permitted a systematic arrangement of the objects found and the institution of a comparison between them and similar discoveries made elsewhere. Thus fragments at first sight of no apparent value often acquire an unlooked-for significance, from the fact of their throwing light upon the extent of the employment of various objects which have been from time to time found in places distant from each other.

The foregoing remarks are specially applicable to the terra cotta which was formerly used for constructive purposes. Specimens of this material have been found in more or less considerable number since the commencement of the explorations, the importance of which, from an architectural point of view, has only been recognised at a comparatively recent date.

* *Vossische Zeitung* (Berlin).

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Although the questions involved had not been finally settled, a reference to them is appropriate in connexion with Winkelmann's treatise on the use of terra-cotta in the *geison* and roof of Greek buildings.*

At one time it was an accepted principle that in both sculpture and architecture the Greeks rejected special colouring substances, and in all cases preserved the natural colour of the material. As to both subjects, modern research has proved the unsoundness of this theory. In consequence of more careful observation during the course of explorations, traces of colouring have been noticed with certainty. Thus the conviction gains ground that the buildings themselves, as well as the reliefs and rows of statues, were coloured for ornamental purposes; and what is true of statues when used in architecture must also be considered as holding good with respect to them when they are independent works of art.

The extended acceptance which the theory hitherto current met with is ascribed to the fact that observations as to the presence or absence of colouring were made more or less accidentally by travellers, whose negative expressions were considered (though opposed to positive assertions) sufficiently capable of proof to controvert any ideas as to the original use of colouring. Besides, although traces of former colouring may have been noticeable when discoveries were made, it would, of course, be difficult to find them after some time had elapsed, particularly in the case of marble, which would in the sun rapidly lose any remains of colour in consequence of the drying which would thus be caused to take place.

It is particularly by means of the discoveries made of terra cotta that light has been thrown upon the polychromatic treatment of architectural works in ancient times. In cases where the burning in of the colours imparted considerable durability to them, observations have not been made in merely a cursory manner, but numerous specimens have been preserved, and an augmentation of the present number of them in Germany is looked for in accordance with arrangements which have been made.

The discovery of the treasure-house of Gela has had much to do with settling the various questions at issue as to the employment of terra cotta in Olympian architecture. Most of the Grecian states and colonies are supposed to have had special edifices or treasuries at Olympia, in which the sacrificial gifts brought by the inhabitants of the different states were safely kept. They were situated close to each other on the terrace on the southern declivity of the Kronion Hill, and their sites can still be traced by the foundations, though the structures themselves have long since disappeared. Yet sufficient evidence exists as to the materials of which the Gela treasure-house was composed to show that the *geison* and *sima* were not prepared in the same manner as the other stones in the building. Traces of bronze nails having been discovered in these stones at regular intervals, and specimens of painted terra-cotta work found in the immediate vicinity presenting corresponding appearances, the conclusion has been arrived at that the latter were at one time fastened to the former.

The architects who had so far elucidated the question at issue did not, however, content themselves with the progress thus achieved, but pursued their researches in other places, more particularly in Sicily. From their investigations it was satisfactorily proved that the style of architecture of the aforesaid treasure-house was similar to that usual in the district of Gela, in Sicily. It has therefore been presumed with more or less reason that the portions of the building which still exist were executed at Gela and transported to Olympia.

It was also found that other Sicilian cities contained examples of a similar kind of incrusted terra-cotta to that found at Olympia. In particular, the temples at Selinus (from which several sculptures and architectural objects are to be found in the museum of Palermo) are noteworthy for the arrangement of the numerous terra-cotta slabs, the importance of which to architectural research had not previously been fully recognised. The colours of the various slabs are not uniform, but black, red, and yellow predominate. It is conjectured that the slabs must have been re-baked after being coloured, and to this operation is ascribed the durability of the colouring substances employed. The principal ornamentation consists of a Vitruvian scroll, and an entwined ribbon pattern. Palm-leaves also occur frequently, but other designs are also met with.

* It is remarked that on the pillars which support the structure, rests the architrave, and then follows the frieze. Above the frieze comes the *geison* made of intersected projecting stones, which may be considered as supports of the roof; then the *sima* with a gutter, as finishing off the lower part of the roof.

INTERNATIONAL EXHIBITION OF FINE ARTS AT MUNICH, 1883.

The Artists' Society of Munich have issued an address to all artists connected with the plastic arts, inviting them to participate in the next International Exhibition of the Fine Arts, which will take place in Munich next year, 1883. The address runs as follows:—

"To Artists! Comrades!—In the years 1869 and 1879, Munich, the capital of the art-loving princes of Bavaria, gave a cordial reception to its guests at the great International Exhibitions of Art in those years. Artists and laymen alike received valuable impressions from those displays, which contributed materially to foster and promote the noblest efforts. What was then so well begun, the artists of Munich are resolved to continue, and they make it a point of honour to perform this duty. Once more, therefore, we invite all our comrades in art to a peaceful contest, and to assist in bringing together a rich display of contemporary artistic talent and creative energy. The third International Exhibition of Art in Munich, in 1883, will, it is hoped, present fresh evidence that in their efforts to attain the highest aims of art all nations are united. In the course of a few days, the detailed programme drawn up by the Central Committee of the Exhibition will be issued. At the present moment we wish in particular to make known that his Majesty King Louis II. has been pleased again to accept the office of Protector or Chief Patron of the Exposition. The Bavarian Government has also promised its active sympathy and support, and to grant gold medals for the reward of the most distinguished contributors. A large number of the works exhibited will be bought by help of a lottery, while the success of the late Munich exhibitions affords sufficient guarantee for further excellent opportunities of disposing of works that are for sale. The plan we purpose following on the approaching occasion is that each country should have a separate collective exhibition, with a jury of its own countrymen; while the committees entrusted with various departments will invite the co-operation of foreign artists to assist them in the performance of their tasks. It is intended that the Exhibition shall last from the beginning of July till the end of October. These few remarks will be sufficient to give a preliminary idea of what we purpose. We shall use our utmost endeavour to give you a worthy reception. Accept, therefore, our friendly invitation."

THE OLD MANOR HOUSE ESTATE AT DULWICH.

What is historically known as the Old Manor House Estate, at Dulwich, which was Edward Alleyn's first seat at Dulwich, about the period when he was founding his college, will very shortly be covered with modern buildings. The whole of the estate, about 15 acres in extent, has been let on lease for building upon, and is now being laid out for that purpose. The ancient mansion, in which Alleyn resided, has just been taken down; but the timber on the estate, which includes several fine old trees, yet remains, and in laying out the estate it is intended to preserve as much of it as is possible. An old pollard elm, standing in the grounds, close to the site of the mansion, and which is of great age, is of unusually large dimensions, being between 8 ft. and 9 ft. in diameter, and about 26 ft. girth. This tree is believed on many occasions to have formed a pleasant shelter for Alleyn and his dramatic and other friends. The estate now about to be utilised for the erection of suburban villas extends from the old high-road leading from Norwood to Dulwich, to the foot of Gipsy Hill in a south direction, and westward it stretches almost to the boundary of the cemetery. On the east side it extends to the grounds of the new college. The roads are now being laid out, and building has already commenced. The residences to be erected on the estate are about 180 in number, of rentals ranging from 60*l.* to 120*l.* per annum. The houses are all to be built under the immediate superintendence of Mr. Charles Barry, architect to the Dulwich Estate.

THE LONDON AND PROVINCIAL FIRE ASSURANCE COMPANY'S NEW BUILDINGS.

At the corner of Abchurch-lane, King William-street, the London and Provincial Fire Insurance Company are erecting an extensive block of new buildings, a portion of which is intended to be occupied by the company, whilst the upper floors will be let as offices. The buildings will have a handsome and commanding elevation in Portland stone, in which a profusion of elaborate and ornamental carving will be introduced. The frontage is 36 ft. in length, and extends to a depth of 80 ft., the height of the building, which contains five floors besides a deep basement, being 58 ft. The elevation at each angle is surmounted by two towers, rising to a height of nearly 70 ft., and above the main cornice in the central portion of the frontage there are ornamental gables. The ground and the first, second, and third floors have bold mullion windows. Immediately above the ground-floor windows is a deep projecting cornice, surmounted by a balcony. There are richly-carved panels carried across the frontage between the windows of each floor, and similarly carved panels and pilasters at each angle of the elevation. The second-floor windows are surmounted by arches, within which there is some very elaborate carving, including the arms of the company. The top floor of the building is in a high-pitched roof, covered in with sea-green slates, the towers being covered with the same material.

The main entrance to the building is in the centre of the ground-floor, the whole of which is intended to be occupied as one large apartment for the transaction of the business; and containing an area of about 2,400 ft. It will be very artistically decorated and fitted, and will be lighted by an ornamental lantern in the centre covered in from an open well, faced with white enamelled brick, from which several of the offices in the upper floors of the building will also be lighted. A considerable portion of the basement, which will also be occupied by the company, will be fitted up as a strong room. The ground-floor portion of the building will be entirely fire-proof. There will be a separate entrance at the corner of King William-street, leading, by a stone staircase, to the upper floors containing the general offices.

Messrs. Davis & Emmanuel are the architects, and Messrs. Trollope & Sons the contractors. Mr. Richards is foreman of the works. The cost of the building will be about 10,000*l.*

STAIRCASE OF THE "PUERTA ALTA," OR "CORONERIA," BURGOS CATHEDRAL.

We learn from Spanish historians that Don Juan Rodriguez de Fonseca, an eminent prelate, who resided at Burgos from 1513 to 1524, impelled by veneration for the basilica of that city, the work of Francisco de Colonia, conceived, in 1516, the idea of dismantling the staircase of the upper door, and of replacing it by a more ambitious piece of architecture. Accordingly, he had the old staircase removed, and submitted to the cathedral chapter a sketch for a new erection, drawn by a certain Diego Sylve, an artist of the time well known for his works. The project was sanctioned, as we learn from an entry made in the minutes of the chapter meeting on November 4th, 1519, and begun and completed under the prelate's supervision. As late as 1866 it was not known who was the originator of the design; and it was only then discovered by the learned author of the "Historia del Templo Catedral de Búrgos," Señor Don Manuel Martinez y Sauz, canon of the cathedral.

The staircase, of which we give an illustration in this week's *Builder*, is placed on the north side of the transept, between the chapels of San Nicolas y del Nacimiento and of the Concepcion de Nuestra Señora, and served formerly for the upper door or *coroneria*, which was closed in 1786, by order of the chapter, on account of the draught which it caused in the church. The staircase was called in the sixteenth century, and even later, *escalera dorada*

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(gilded staircase), on account of the ironwork being gilt. The latter is stated to be the work of a Frenchman, Hilario, and not (as is erroneously asserted by Señor Madoz, in his "Diccionario Geográfico") of Cristóbal de Andino, architect and sculptor, who, however, made the valuable ironwork which adorns the chapels of the Condestable and of the Consolacion y Presentacion de Nuestra Señora. On the staircase, which was erected and completed in 1522, is placed an altar for the Maundy Thursday celebrations.

WAREHOUSE, HARROW-ROAD.

THESE premises are amongst the largest which have been erected in London in connexion with the leather trade. They have been built by Messrs. Lilley & Skinner. A spacious and very light basement, nearly 14 ft. high, gives accommodation for about 130 persons engaged in the manufacturing department. On the ground-floor are the private and clerks' offices and waiting-rooms, a large leather show-room, goods entrance, and lift. The three upper floors consist of warehouses and show-rooms. The frontage is about 110 ft., and the site, which occupies a conspicuous corner against Paddington-green, forms a part of Harrow-road as widened and improved by the Metropolitan Board of Works.

The building was erected from the designs of Mr. J. Wallis Chapman, of 11, Sutherland-gardens, Harrow-road, by Mr. J. Woodward, of Wilson-street, Finsbury, in fourteen weeks.

NEW STREETS AND COMMUNICATION BETWEEN HOLBORN, THE LAW COURTS, AND THE STRAND.

THE completion of the new Palace of Justice, and the certainty that very shortly this important work of Mr. Street's will be opened by royalty, —either the Queen in person or the Prince of Wales,—brings the subject of the approaches to the building prominently before us.

One of the longest-felt wants in our street communications, and one of the most obvious in that business part of London, not being actually in the City nor the West End,—long, indeed, before the Post Office had formed its districts, and called this one "West Central," —has been the want of direct connexion north and south between the line of the "New-road," as it used to be called, which receives all the streams of traffic from the high ground of Hampstead and Highgate, and the slopes of the same, as Haverstock-hill, &c., and the line of the Strand,—from which steep streets run down to the Thames Embankment.

The Holborn line runs about midway and parallel to these two main lines, receiving on the north and giving out on the south, as it were, in some few irregular little streams, the traffic which ought to flow on in continuous courses. None of these pass onward in anything like a direct line. Some come altogether to an abrupt ending in Holborn, and a passage can only be continued southwards through small and distant openings, almost lost amidst a locality filled with poor and narrow lanes, which should have been marked "no thoroughfare" long ago, as they lead nowhere, and end only in confusion and dirt. Only the London cabman can be trusted to find an exit through the tortuous and narrow ways from Bloomsbury or the neighbourhood of Lincoln's Inn Fields to Somerset House, or that part of the Strand between St. Mary's Church and St. Clement Danes. If a stranger try it, he is as likely as not to get into a very dirty and once really dangerous *cul de sac*, and be set upon by little ragged urchins offering to show him the way out, hoping for some trille for so doing. To find one's self caught in the neighbourhood of Clare Market without plenty of time to seek one's way out is really not a pleasant matter, as many of our readers may well know.

From time to time remedies for this state of things have been suggested, but when the great discussion as to the site of the new Law Courts was going on, some special plans were produced differing according to the position in which it was suggested the Palace of Justice should be built. One notably,—proposed as the site the centre of Lincoln's Inn Fields, giving additional access thereto by openings north and south of that locality. In that case of course the objections of the occupiers of the houses adjoining, to the great traffic brought to and through the Fields, would have had to be overcome.

But the erection of the Law Courts on the Carey-street site, as it is called, and the completion of them for the present, have both set aside all these premature schemes, and afforded an opportunity for bringing forward one which is eminently practicable,—designed by Mr. C. Forster Hayward, F.S.A., architect,—which we reproduce in our present issue. Though long contemplated by the author, it is new in the sense of being just adapted to the circumstances of the present time and the exigencies of the case.

It is evident to any one who either knows or studies the locality that, owing to the laying out of the streets and squares in the Bloomsbury district so as to give no through line anywhere, —an arrangement more like the setting out of a maze than of the streets of an inhabited town, —there is but one long *direct* line from the north by Euston to Holborn, past St. Pancras Church, through Russell-square and Southampton-row. This is continued in a direct line across Holborn as far as Great Queen-street, through Little Queen-street (which it was proposed to widen only a year or two ago, and to which improvement the Metropolitan Board of Works were willing to contribute a large sum), and there stops abruptly, the traffic being diverted at right angles,—eastward into Lincoln's Inn Fields, and westward along Great Queen-street, taking its onward course by Drury-lane or Long-acre. The fine old houses on the west side of Lincoln's Inn Fields have all large gardens at the back, on part of which exist some old sheds and one-story buildings, not only of little value, but some of a highly objectionable nature, so that there is no formidable range of buildings to take down nor valuable businesses to require compensation.

Mr. C. F. Hayward, besides being an architect of many years' standing, is the District Surveyor for the St. Giles's district, and being, as may be supposed, well acquainted with the locality, has planned to continue this line southwards by a new street cut through the gardens, sheds, and similar unimportant property existing at the back of Lincoln's Inn Fields, passing through Chapel-mews and Bear-yard with a slight curve, and so avoiding the Roman Catholic chapel in Sardinia-street and the School Board schools in Vere-street. At this point the new street would open into a wide "Place" or "Circus," the centre of which would be in the exact line of the west side of Lincoln's Inn Fields, to which it would be opened by removing some old projecting buildings in Portsmouth-street. Some new frontages already built would form part of this new Circus. It would then pass on to the Carey-street front and west side of the new Law Courts, and so on to the Strand, near St. Clement's Danes, leaving King's College Hospital on the east and Clement's Inn on the west intact.

By a continuation of Newcastle-street, Strand, in a direct line to the Circus (with very little demolition of property, as it would cross two streets in that small distance), the traffic for the west would be diverted from the line of the Law Courts and pass out through Newcastle-street, close to the Church of St. Mary-le-Strand. Thus special facilities would be separately afforded for both the south-eastern and south-western traffic to and from the north without entering Lincoln's Inn Fields at all.

It is supposed, however, that suggestions from another quarter for opening up the north-western end of Lincoln's Inn Fields, through Little Turnstile from Gate-street, are under consideration, and if so, the traffic requiring to go in that direction will also be facilitated; but this opening alone would not permit of direct northern traffic, and, although in itself desirable, would still leave the difficulty of *direct* communication in that direction just where it is. At the same time this opening into Holborn would form an admirable supplement to the plan herein proposed, and the objections which the inhabitants would surely raise if the whole of the traffic northwards were carried through the western side of Lincoln's Inn Fields, would be less if the main traffic northwards were diverted to a more direct line behind, and only such portion as required to go towards the City passed through the fields.

The importance of the subject to this locality of the metropolis is considerable; for the utilising of vacant ground, the improving the rating value of the district, at the same time that the thoroughfares are increased in number and some widened and improved, cannot but be matters of special interest to the inhabitants of the locality. It is seldom that so large and so long-acknowledged an improvement can be so easily and so cheaply accomplished, there being hardly any other neighbourhood wanting communications where there is at the same time so little in the way of them; for where the ground is not actually vacant, the property is generally so wretched and bad, in a sanitary as well as a constructive point of view, that it has long been understood to require renovation the first opportunity.

The opening of the New Law Courts will show the necessity for some plan for access on the north-western and south-western sides, and it is submitted that the plan proposed herein is the most desirable to adopt in the interests of the public generally as well as of the inhabitants of the locality in particular.

Many additional communications suggest themselves, and some are shown upon the plan, such as the connexion which might be opened with Covent-garden, now that the street, — late Princes, now Kemble, street,—is widened, and bounded by Peabody Buildings, and with Long Acre through the head of Great Wild-street. Again, the widening of the Strand and Wych-street, continuing Drury-lane, and so forth. But one of the most valuable would be the removal of the block of buildings in Carey-street, next King's College Hospital, and so adjusting the entry into the new street that a further space could be given to the site for the New Law Courts, which indeed may soon be greatly needed.

Mr. Hayward's plan was referred to in the address of the President of the Institute as reported in our last week's issue, p. 613, and many others professionally well acquainted with, as well as inhabitants of, the locality,—notably, the venerable Professor Donaldson, than whom none perhaps can be a better judge,—have expressed themselves highly favourable to the proposal. We can only express a hope that the matter may receive the fullest consideration of the authorities.

HOUSES AT BROMLEY.

THESE houses have a good frontage to the Windmill-road of about 45 ft. each, and are separated by a 10 ft. passage. Each contains on the ground-floor a drawing-room, 18 ft. by 17 ft.; dining-room, 24 ft. by 17 ft., and library, 16 ft. by 14 ft., with good kitchen, scullery, &c. On the bedroom floors there are ten good rooms, bath, w.c., &c., and every domestic convenience.

The corner house has a return frontage to a new road, in which is placed the main entrance. The chimneypieces to the reception-rooms are of carved walnut and oak, and the corbels of the fittings throughout are of a superior kind. The materials are red bricks with tile roofs and covering to the upper stories. The cost was the very moderate one of 3,550*l.* the two.

The architect is Mr. Charles Bell, F.R.I.B.A., of Dashwood House, 9, New Broad-street, City.

Sanitary Association for Rathmines and Rathgar, Dublin.—A meeting has been held in Rathmines Town-hall for the purpose of forming a sanitary association for the township of Rathmines and Rathgar. Dr. Montgomery Ward, one of the speakers at the meeting, stated that the authorities of the township hoped in a short time to have an ample supply of pure water for it. The works for that purpose were progressing under the supervision of Mr. Hassard, C.E. The township commissioners, in conjunction with those of Pembroke township, had already completed a perfect system of main drainage for the two townships, by which the sewage of those townships was conveyed into the sea, half-way between the Pigeon House and Poolbeg lighthouse. It was resolved to establish the association, and on the motion of Dr. Cameron it was agreed,—

That the objects of the association be,—(1) To instruct all classes of the public in practical sanitary knowledge; (2) To co-operate with the sanitary officers in carrying on their work of inspection; (3) To use all legitimate means to check the spread of infectious diseases; and (4) To provide suitable visitors to go amongst the working-classes, lend sanitary pamphlets, and give them hints on the simple laws of health.

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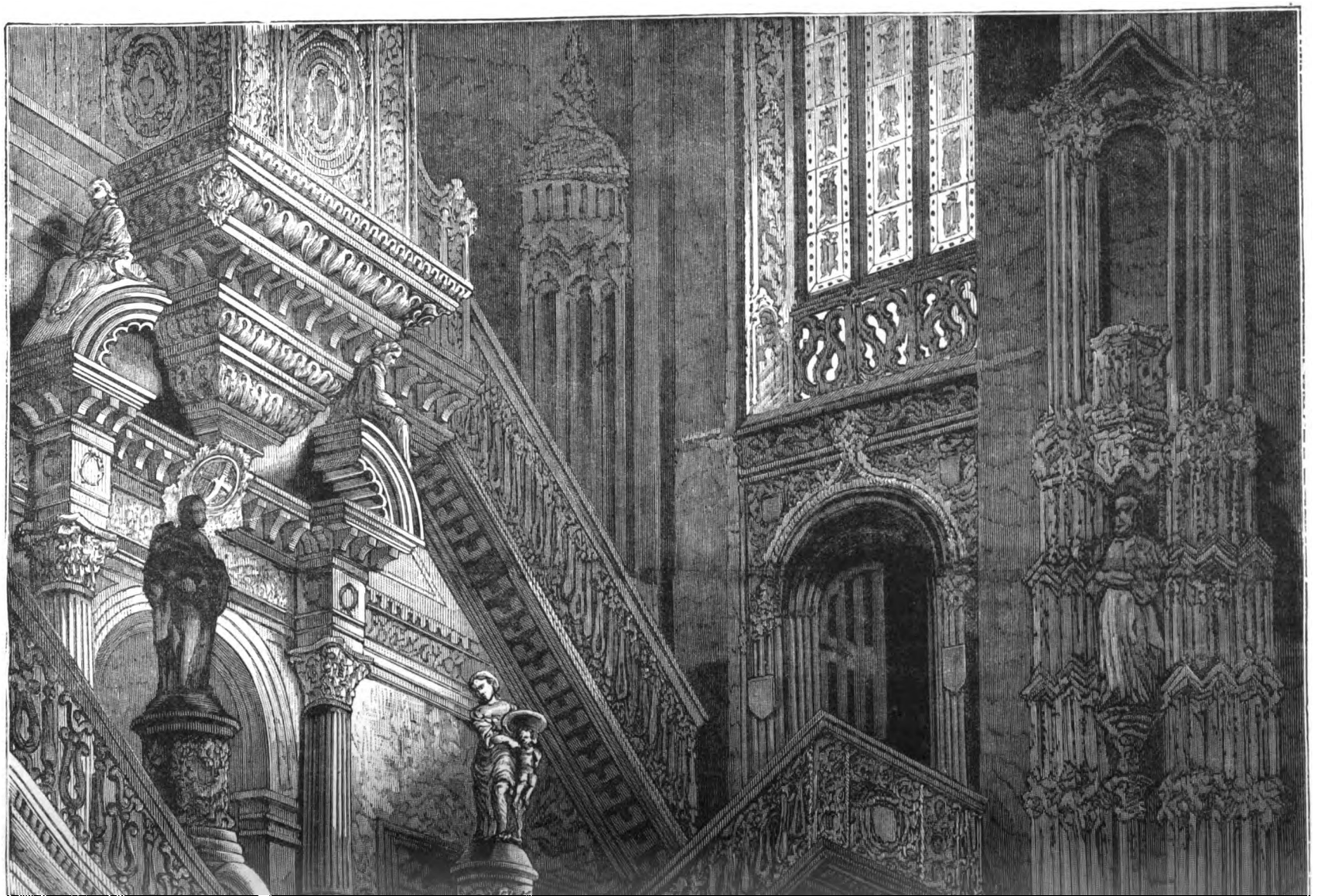

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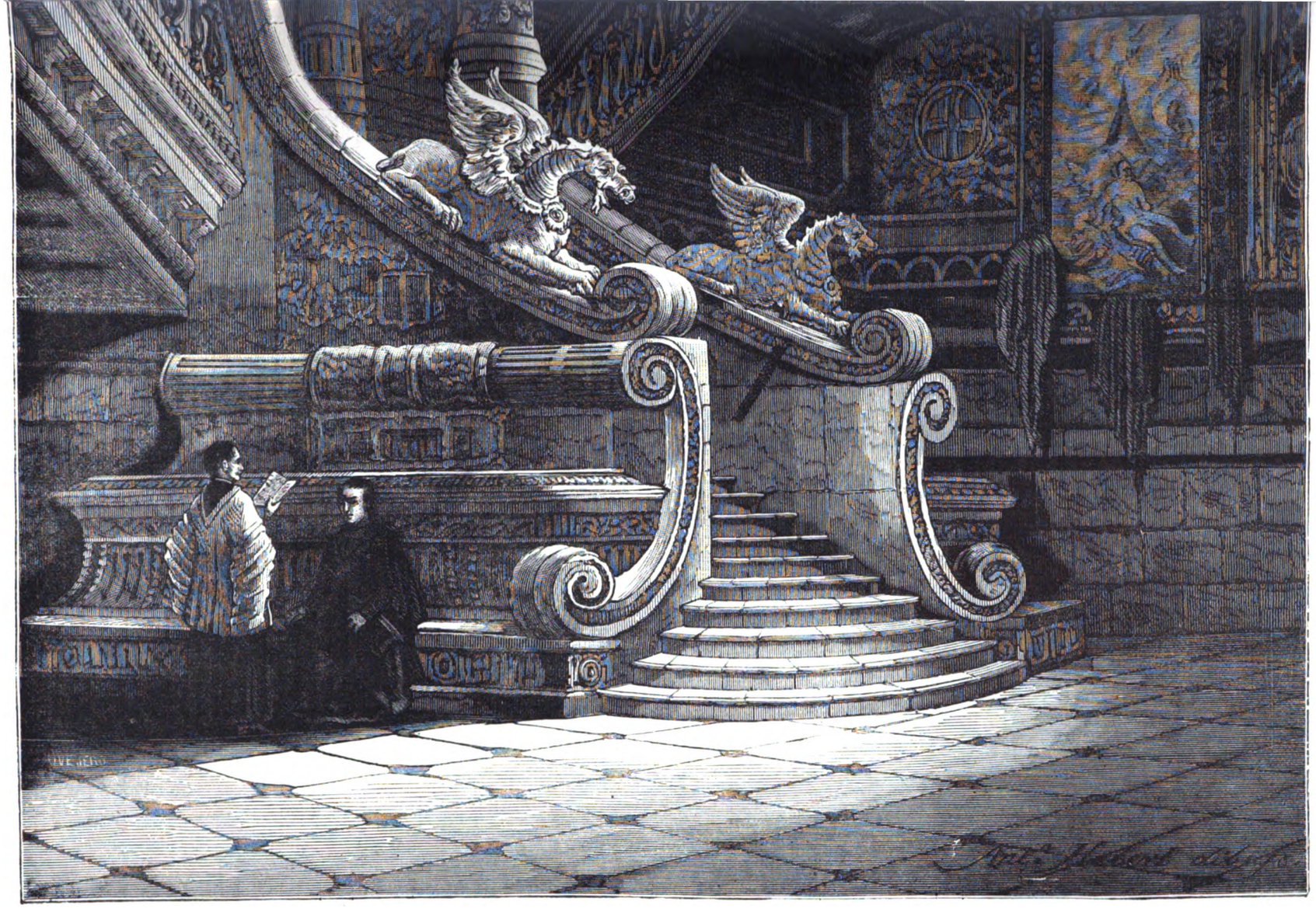

THE STAIRCASE OF THE CORNER, BURGOS CATHEDRAL, SPAIN.

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WAREHOUSE BUILDINGS, PADDINGTON GREEN.

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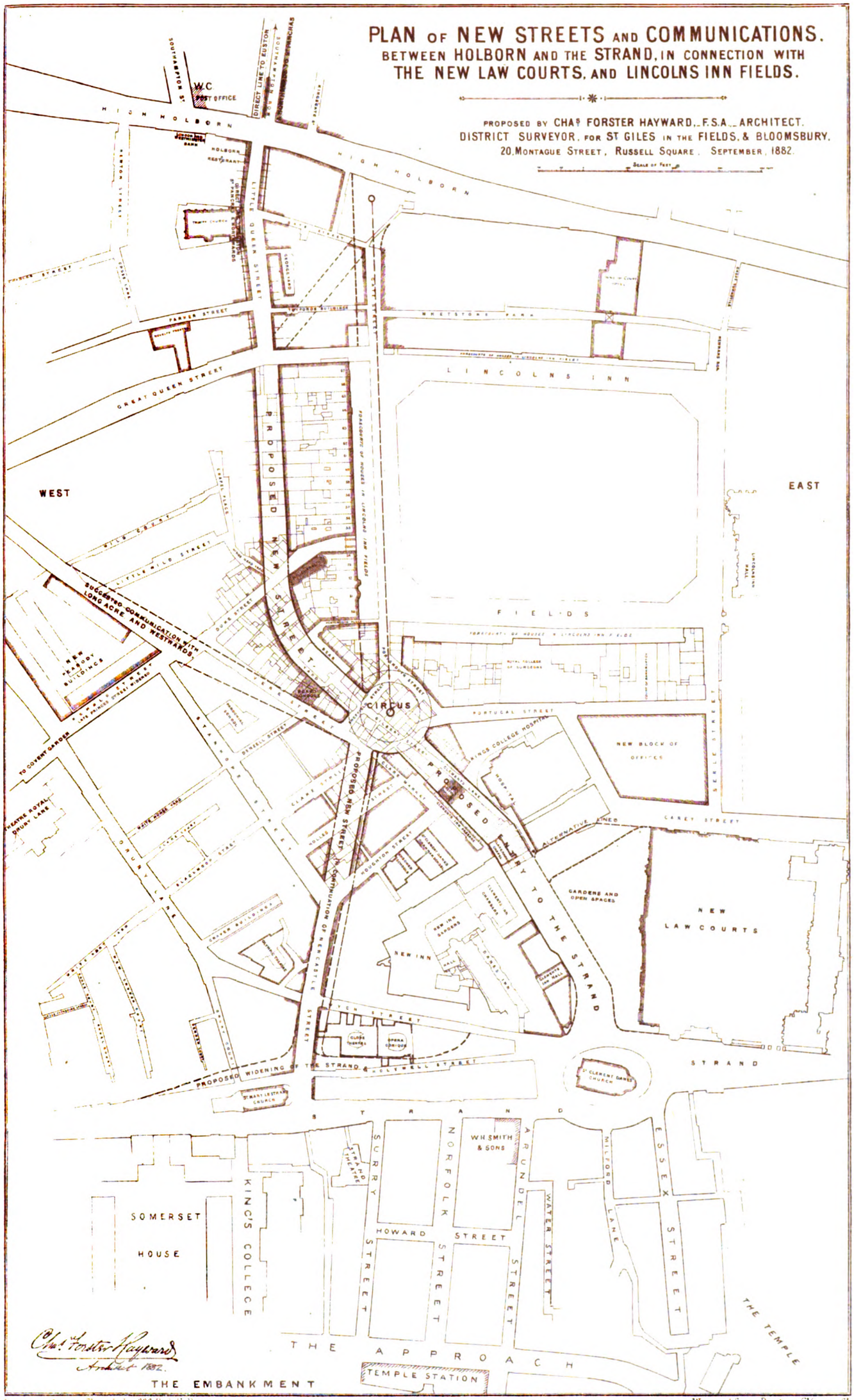
PLAN OF NEW STREETS AND COMMUNICATIONS.

BETWEEN HOLBORN AND THE STRAND, IN CONNECTION WITH THE NEW LAW COURTS, AND LINCOLNS INN FIELDS.

PROPOSED BY CHAS FORSTER HAYWARD, F.S.A., ARCHITECT.
DISTRICT SURVEYOR, FOR ST GILES IN THE FIELDS, & BLOOMSBURY.
20, MONTAGUE STREET, RUSSELL SQUARE. SEPTEMBER, 1882.

Scale of Feet



Chas Forster Hayward
Architect 1882.

Waterlow & Sons Photo-Litho 23E High Holborn

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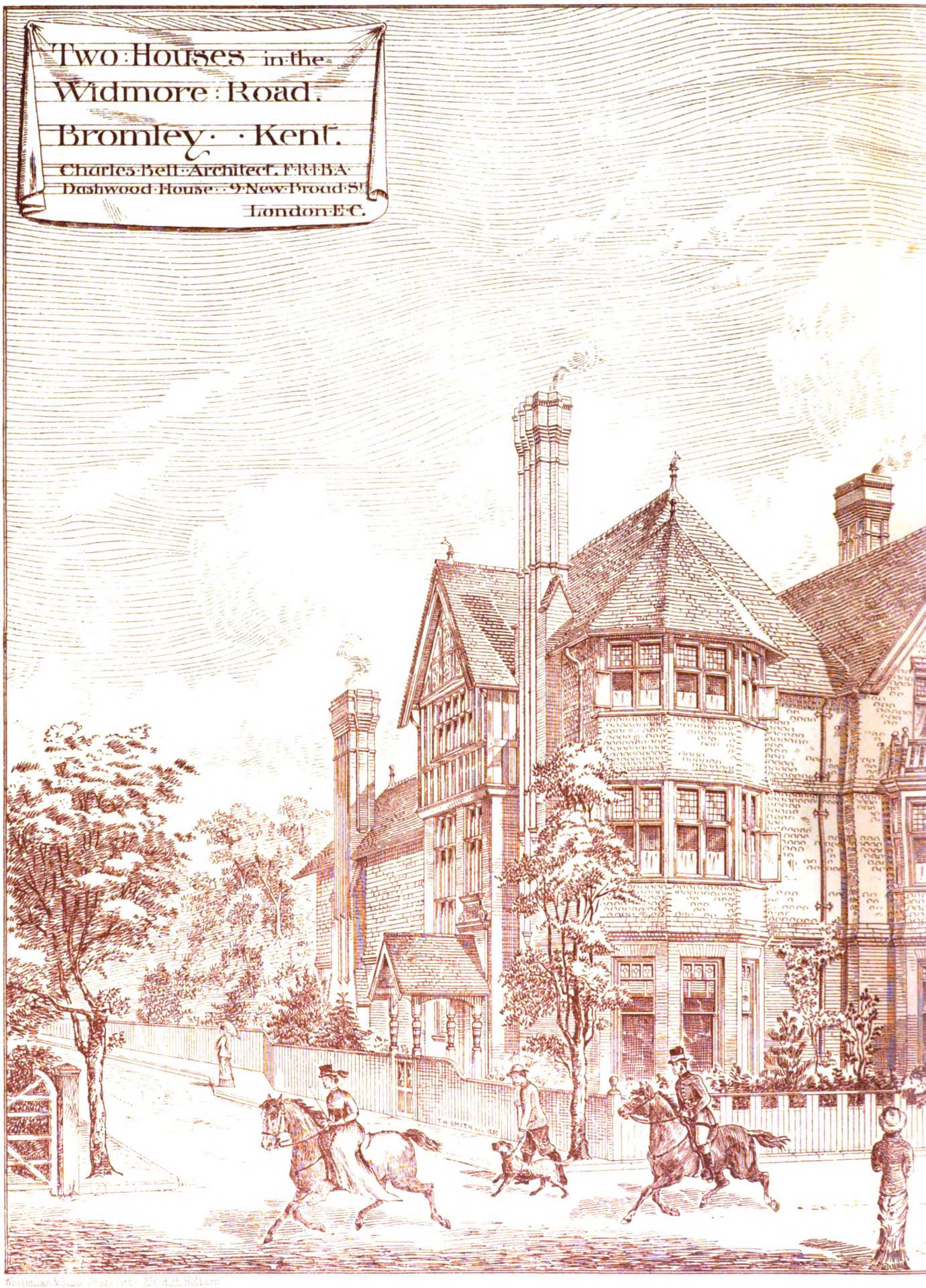
Two Houses in the Widmore Road, Bromley, Kent.

Charles Bell, Architect, F.R.I.B.A.
Dashwood House, 9 New Broad St.
London, E.C.



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PROFESSIONAL TOPICS AT THE ARCHITECTURAL ASSOCIATION.

THE Architectural Association held its first ordinary meeting for the Session 1882-83, on Friday, the 10th inst. After the despatch of other business (which included the nomination of no fewer than fifty-nine new members),

The President (Mr. E. G. Hayes) delivered his inaugural address, in the first portion of which he reviewed the educational work of the Association as carried on during the past session by the various classes, courses of lectures, and other means. Although a very great deal of useful work was done in the classes, its amount might be greatly increased if a larger number of members joined the classes and attended regularly. Reference was made to the value of the courses of lectures now in progress of delivery to members of the Association by Messrs. Tarver and Blashill, in connexion with the Classes of Design and Construction. The library of the Association now contained about 1,200 volumes, and was much used and highly appreciated by the members. The excursion to Northamptonshire was largely attended. The work seen was for the most part domestic, and of that peculiar character which was familiarly described as "late and flat." Nothing earlier than the thirteenth century was worth looking at, and nothing (as it appeared to some of the party) was too late or too utterly dreadful to be sketched, measured, and adored. Even the cherubs' heads and the palm-branches on the tombstones in the churchyards did not escape attention. However, the annual excursion afforded an agreeable opportunity for studying in common such specimens of work as the taste of the day or the inclination of the members might lead them to select. Looking at the general position of the Association, the President observed that if the accession of new members was to be taken as a sign of increasing prosperity, the Association might certainly congratulate itself.* Passing on to topics of general professional interest, he said:—

I must not neglect to say a few words upon the subject of the Institute Examination. We shall, no doubt, all be ready to admit the desirability, if not the absolute necessity, of taking some steps to insure a fit and proper training for all those who may wish to practise as architects. It is desirable first, upon professional grounds, that by guaranteeing a certain known and recognised standard of proficiency in all those who may hereafter become Associates of the Institute, the professional status of the whole body may be raised, so that in course of time the mystic letters signifying membership will have a real value, and no architect will be recognised unless he has them, and thereby unqualified practitioners will be excluded. It is desirable, upon public grounds, that in employing the services of an architect, the public may be assured that they are placing their interests in the hands of a man who has received special training for the work he undertakes to do, and does not simply rely upon his own very common sense for the general idea, and upon other persons' brains and knowledge for the practical working out of the scheme. And last, but not least, it is desirable, for the sake of architecture, that our art, which is so long-lived, may, so far as lies in our power, be improved, or, at all events, may run less risk of being vulgarised and brought into disrepute, as it too often is now by the performances of amateurs and others whose only qualification would appear to be a knowledge of "how not to do it." With these ends in view, it behoves us all to do what we can to insure the success of the scheme. Every student should be encouraged to look upon it as a necessary part of his career, and must no more dream of trying to practise without it, than a doctor or a lawyer does, each in his respective calling. It will, no doubt, involve a certain amount of hard work and self-sacrifice; but the end to be achieved is well worth this, and it is not so great but that two sessions of diligent work in our classes will go a long way to prepare a student for it.

There is no doubt that the position of architects, as a body, will be greatly improved in time by this Examination. There is great room for improvement in this respect; at the present time there are so many hangers-on of all kinds, —men who have possibly been in some branch of the building trade dub themselves architects; others there are who consider it a nice easy sort of occupation to combine with sundry other vocations which they already carry on, such as agencies, and the like. These are the things which have brought the profession into disrepute, so that the ordinary public scarcely know what an architect is, or ought to be. He is often looked upon, by people who ought to know better, as a sort of builder, a useless kind of being upon the whole, and one of whose duties and responsibilities very little is known. Persons of this class would rather place their interests and requirements in a builder's hands, with vague uncertainties as to price, and what they are to get for their money, than incur the cost, but to them the doubtful advantage, of employing an architect. Then there is another class of persons who think because now any one can call himself an architect, so any one can do an architect's work. Such a man is frequently met with; he has great confidence in his own capabilities, and is sure he could design a house as well as any architect. He knows exactly the sort of plan he requires, which is probably that of some house he recollects; he is discreetly silent as to the elevations, but assures you confidently he is sure he could carry it all out, and that all it wants is a little common-sense. If he tries, he probably finds that this was precisely what he did want.

Much of the ignorance as to the duties and responsibilities of architects, and the tendency to amateur performances referred to, will doubtless disappear before an assured status, such as will be obtained for the profession when the Examination becomes a fully-recognised qualification.

It will, I fear, be a long time before the public will be brought fully to recognise the fact that architects are men whose profession, upon the artistic side, consists in showing upon paper plans and designs for buildings, and other schemes, which ideas are afterwards carried out by them, and consequently that they are better able to judge of the effect of designs when upon paper than those who do not devote themselves to such matters, and often scarcely understand what a plan is. We have seen recently some cases in which architects have ventured to express their opinion upon some proposed public improvements, and in both cases, I believe, the suggestions have been politely declined by the unprofessional judgment of those in authority. It is a great pity that such should be the case, but so it is. This great city of ours might be a very different kind of place if in all those questions artistic effect received its proper share of consideration, instead of being, as it generally is, thrust aside, and the utilitarian aspect alone considered.

There is another matter which I think has an important bearing upon the status of our profession generally, and that is the habit which architects have of criticising in rather too unmeasured language the works of their brethren. Now, it always seems to me that we get quite enough criticism of this kind from an unthinking and unappreciative public. In most things it is considered desirable that a person who takes upon himself to criticise any particular work should know something of the matter upon which he wishes to speak. This fact does not seem to be at all recognised as regards architectural criticism; in this subject any one who has eyes to see does not hesitate to form his judgment and to condemn or praise as the spirit moves him, but generally the former. Now, I think it is a pity for us to lend ourselves in any way to this sort of thing. We should endeavour to be temperate in our remarks, not finding fault, as would almost seem to be the case sometimes, to show forth our own fancied superior knowledge,—to appear wise in our own conceit. If we undervalue and condemn each other too hastily, we do but encourage the wholesale system of criticism and condemnation to which we are all more or less subject.

It is a useful thing for us to stop, as it were, for a few minutes, as we are doing to-night, to review generally the work of the past session, and our plans for the future; to consider whether we are taking that position as a student society which we ought to take.

If we look around we see on every side great activity in the architectural world. There is no doubt that our art has been making great progress in late years. Very many large and important buildings have been put up in different parts of the country in almost every known style of architecture. These buildings show in most cases a variety in design and fertility of imagination which are very creditable to the profession at large. All this variety of design and the information essential to meet the numerous and varied uses of our modern buildings necessarily entail an increased range of study upon the part of the architectural student, and I think that any one who looks at the history of the Association will see how it has endeavoured to keep abreast of the demands of the age, and to satisfy the probable wants of its members upon all artistic and practical subjects.

The so-called Queen Anne revival still continues to be very fashionable, and appears likely to hold its own for some time to come. It includes in its modern treatment a wide range of design, which makes it equally suitable for a cottage or a mansion, or for public buildings of almost any kind, and whatever may be the objections to it, we cannot say so much of many other kinds of work. It is adapted to modern requirements in various ways; first, because it allows of large windows and plenty of them, and does not altogether ignore the good qualities of plate-glass, for which so many of our clients entertain such an unbounded admiration, while, at the same time, the artistic eye can be partially satisfied by stout sash-bars and small squares introduced into other portions of the design. Then it does not altogether object to lifting sashes, and it admits of the more artistic treatment of this deservedly popular form of window. Also, on account of its entire freedom from rule or order, it lends itself to all our modern requirements in planning, and at the same time allows of the introduction, even in buildings of the simplest kind, of internal features which give character to the work throughout. Another important consideration which has made this kind of work so very suitable is that it is essentially a brick style of architecture; and although in its more elaborate developments of carved brickwork it is almost as costly as stone, yet these elaborations are luxuries which need not be introduced. These are some of the chief reasons for the rapid rise and extensive use of this fashion of buildings, and which will in all probability serve to keep it in fashion for some time to come. We know that it is looked down upon and ridiculed by many, and that the detail has been stigmatised by a great poet as "jolly rubbish, which can be rattled off by the mile." This, however, is not an essential quality in the work, although, no doubt, it is a distinguishing mark of much that is done. Many modern buildings might be mentioned in which great refinement is shown in the details and mouldings. I think the charge of want of refinement is with more reason to be brought against the work in its main features and general outlines, in which quaintness of form is frequently carried to a point verging upon extreme ugliness. I leave for the present the question how far these ugly, hump-backed, one-eyed effects are useful in architecture in enabling us to appreciate the more beauty of form and purity in outline when we see them.

We have lately seen some revivals of a slightly earlier type of work, when the mouldings and ornaments of the Renaissance were being engrafted on to the dying-out forms of Tudor work which had preceded. This was, to a great extent, the type of work visited in the recent excursion,—generally picturesque and interesting, often good in form and sometimes in detail, but very often coarse both in the one and the other; in any case, an undesirable training for a student, who ought certainly to be encouraged to gather his inspiration from purer sources. It would seem that in designing work of this description more than the usual amount of care and taste is necessary to prevent the introduction of features which, however picturesque they may be in themselves, tend to vulgarise the design. These mixtures require to be compounded with very great skill and judgment, or they had better be left alone.

We seem to be unable at present to pin our faith to any particular style of work for secular purposes: there seems to be such a ceaseless craving for novelty and variety. This is no doubt due to a large extent to the prevalence of the competition system, the desire or the necessity to produce some startling novelty, some sensational effect, which shall attract attention and perchance obtain the work. Were it not for this, architects would, I doubt not, be willing enough to be "sober in their designs," and to cease striving after eccentricities which tend so much to vulgarise our art, and there would be

* The "Brown Book" of the Association states the total number of members to be 814 (of whom 725 are resident in London), as against a total number of 863 in Session 1881-82.

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a better chance of carrying on more generally some kind of work, and possibly developing it in a way that should make it distinctive of the latter part of the nineteenth century.

I ventured the other evening to make a few remarks upon the prospect of a new style in architecture, and to express my opinion as to the possibility, or, rather, the impossibility, of such a thing.* This opinion was based upon the assumption that the various combinations of forms which, in past ages, have been adopted, and which constitute the different styles, are, in reality, well nigh worked out and exhausted, and that it is hardly possible to devise any sufficiently new combinations to produce a really new and distinct style. I will not take up your time by attempting to follow out this reasoning, because it can have no practical result, although the subject is one of much interest as a mere speculation. However, I may say this much, that if we are to have anything approaching a new style in architecture, which I am not at all sure is wanted, it will be produced only by combined effort and by steady systematic work in one direction, starting with some particular style as a basis, and training students to work in it alone. Then in time the requirements of the day, being expressed by many minds, may possibly develop into a really modern style. This is, however, but a mere dream. At the present time we are further from it than ever; all the change and variety in which we are now indulging will certainly not conduce to anything of the kind.

And now let us consider, for a few moments, what is the chief end and object of all our work here. It is in order that we may endeavour, as far as possible, to follow out the advice given in our motto,—"To Design with Beauty and to Build in Truth." How difficult it is to arrive at any proper appreciation of what is really required by the first part of this instruction, and how much more difficult it is to explain! We can, no doubt, all talk glibly enough about beauty in architecture, and each one of us probably thinks he knows what he means, but it is not easy, if not impossible, to define it closely. Mr. Fergusson, in his work upon the subject, says:—

"One of the most prevalent sources of error is the assumption that beauty is one single and well-defined emotion, and capable of being reasoned on as such, whereas, in truth, nothing can be more various and, at the same time, more universally prevalent; and so variously are we formed, that to no two men is it the same thing, though all can perceive it, and most men fancy they see it as others do; so each man assumes the beauty he sees or can appreciate to be the only true one, and excludes all others from the category."

This is very true, because, in considering the question in regard to architectural design, we are confronted at the outset by the fact that, unfortunately, architects who make these questions the study of their lives are so seldom able to agree as to the merits of any particular work. There are, of course, the differences of opinion caused by a partiality to some particular style or period of work. A Gothic man cannot see any beauty in a Classic design, and *vice versâ*. However, differences of opinion arising from any of these causes must be disregarded as not worth a moment's consideration, being prompted by individual taste or by fashion, both of which now-a-days change very rapidly. There is no doubt that each style may lay claim to some particular merits,—that all have some qualifications which may entitle some buildings erected in them to rank as works of art and beauty. These qualifications may be defined somewhat as follows:—A perfect sense of repose, of constructive fitness and suitability, a feeling that everything is in its place exactly where it is required, and a sufficiency of ornamentation to impart proper richness of effect, but no excess; in one word, the work must be well proportioned. The word for this purpose must be taken in its widest sense, and must regulate, not only the quantitative relation of the various masses and voids, but the size, position, and amount of all the accessories, such as mouldings, carving, and other ornament. In a perfectly well-proportioned building it will be found either that the bare forms of solids and voids are such as to satisfy the eye by their proportions, and that the arrangement is such as not to be materially affected by the addition of the mouldings and ornament, or it may be that the building requires the addition of its mouldings, strings, or dressings to complete the forms intended and to make them satisfactory in their individual proportions or relatively to each other.

A very great deal has been written and said at different times upon the subject of proportion in buildings, and many attempts have been made to show that beauty in proportion, that is to say, satisfactory relative dimensions of the various parts, is founded upon regular geometrical forms, and that without such geometrical basis such proportions can hardly be satisfactory or beautiful. It is not possible for me now to attempt to discuss this question; it is one of very great interest, and well worthy of close attention. However, I must say this, that although I believe there is a great deal of truth in the system proposed, I do not think it is possible, or hardly even desirable, to reduce the process of architectural design to any such almost mechanical method. The variety of form is so great, and the requirements of our art are so various, as to baffle any attempts to systematise them on a geometrical basis. Ruskin, in his "Lamp of Beauty," says:—

"Proportions are as infinite as possible airs in music, and it is just as rational to attempt to teach a young architect how to proportion truly and well by calculating for him the proportions of fine works, as it would be to teach him to compose melodies by calculating the mathematical relations of the notes in Beethoven's 'Adelaide' or Mozart's 'Requiem.' The man who has eye and intellect will invent beautiful proportion, and cannot help it."

I will quote here also a few words from an article in a recent number of the *Builder*,* which have an indirect bearing upon the subject under consideration. The writer says:—

"All buildings are erected by human hands for human use in one way or another, and hence the scale of the human figure becomes, in regard to architectural proportion, a kind of constant, the effect of which must always be taken into account."

Now it seems to me that the idea suggested by this quotation is the true one, and I do not suppose any one will disagree with the proposition. I wish particularly to commend it to your consideration with this addition,—that the question of fitness and suitability in architectural proportion is to be judged readily and satisfactorily by the eye alone, but that in order to do this the eye must have been trained by a course of study which shall enable it to appreciate the true and the beautiful.

There are and must necessarily be many different degrees of beauty in architecture, as there are in nature, and the differences are caused by the predominance given to one or more of the various qualities of which it is constituted. It is not possible, perhaps not even desirable, for many buildings to possess the highest form of ideal beauty which I have been endeavouring to describe. In buildings of the very highest type the world has ever seen, such as a Greek temple or a Gothic cathedral, the effect is produced by the careful blending in the composition of all these qualities, and the result is the production of works of sublimity and grandeur which have never been equalled. These results of sublimity and grandeur can only be obtained in buildings of considerable importance or monumental character; in most cases we can only attain a much lower standard, until at the lowest end of the scale we must be content with an honest expression of the minor requirements, with such forms and proportions as good taste may suggest, only taking care to prevent the introduction of meaningless and vulgar ornament, which one so frequently sees, and which spoils what might otherwise be a satisfactory design.

Buildings of this kind may be exceedingly plain in outline, entirely devoid of ornament, of quaint, squat, or ugly proportions, but may yet bear upon their face clear evidence of the designer's thought and care. Such buildings, I say, are, of great value in the architectural world. There is a beauty in their simple form, in their plainness, in their quaint proportions,—in short, in their extreme ugliness, which is of the same use in architecture as the ungainly form of a hippopotamus is in the animal world,—that is to say, to set off by contrast other forms and other proportions which are better, and in which more excellencies are combined. At the same time it must not be forgotten that even this perfection in ugliness is not achieved without much care and study.

The sense of a keen appreciation of beauty of form and proportion is one which every student should endeavour to acquire. This sense is, I believe, to be most readily obtained by a diligent course of study from the human figure, and such a course is most desirable for an architectural student. By carefully drawing the figure in outline, or with some rapid kind of shading, not attempting any of that delicate but rather mechanical stippling that we are accustomed to see practised in our art schools, the student learns in time to appreciate delicacy and refinement in form, and the subtleties of perfection in proportion, in a manner and with a rapidity which is, I believe, attainable by no other means. I am told Mr. Burges always attached very great value to this kind of study, and said that he regarded it as a most essential element in the education of an architect. The facilities offered for work of this description in the various schools of art in London are available to all students. I may also draw your attention to the Langham Club, of which particulars are given in our Brown Book. In addition to this drawing from the life, the architectural student must neglect no opportunity of drawing and measuring such executed works as may commend themselves for the purpose.

The objects to be attained by architectural sketching, I take it, are threefold:—

1. To obtain a practical familiarity with the forms and details which were in use, and which constitute the distinctive features of a style, and which cannot be learned from books alone, and to study their proportions.

2. By studying features which are admirable when executed, and transferring all particulars carefully to paper to acquire a knowledge of the reverse process.

3. To lay up in the mind stores of forms and ideas which can be and are unconsciously drawn upon in designing, and which materially assist in combination of new forms.

Under the first heading would be classed all the carefully-drawn outline sketches which are or should be made by a student, and in making them the objects to be gained should not be forgotten; these are to learn the character of the work and to study the proportions,—which, of course, by the selection, we assume to be good,—but certainly not to make pretty pictures. It is important to pay attention to these points. One frequently sees brilliant, showy sketches rapidly done, which are far from being true representations of the portion of the building sketched. It is hard to see how work of this kind can be of much value. With the second object in view, namely, to learn the relative effect of features upon paper and in stone, the best plan undoubtedly is to draw and measure the work, and to plot it to scale upon the spot. It is much better to do so than to leave it to plot afterwards, because it can be done with greater accuracy. And it is as important, if not more so, to measure and draw out the mouldings as the complete feature, in order to learn the effect that the different sections have when executed in the round. The third object is, of course, attained by drawings of both the kinds we have been considering; but the various notes and little bits which one does from time to time are done solely with this object. These little sketches are not to be allowed to take the place of the other two kinds referred to, but only to supplement and follow them. These small sketches are often necessarily roughly done, and an architect looks upon them simply as memoranda to give him hints for new combinations, and trusts to his own power to adapt, modify, and shape them as occasion may require. In these days of changing fashion and requirements, and of the frequent necessity there is to make a design rapidly, it is of importance to every architect to have a store of such material laid up in the recesses of his mind, and he is likely to succeed best who has the largest store to draw upon.

One word as to the manner of sketching, before leaving the subject. Ruskin says, "All merely outlined drawings are bad, for the simple reason that an artist of any power can always do more, and tell more, by quitting his outline occasionally, and scratching in a few lines for shade, than he can by restricting himself to outline only." And again, in another place, "A good artist habitually sees masses, not edges, and can in every case make his drawing more expressive with any given quantity of work by rapid shade than by contour." Now how far are we, as architectural students, to consider it desirable to follow this advice? The answer seems to be, that so far as we are

* See *Builder*, p. 586, *ante*.

* See p. 294, *ante*.

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simply studying effects which we see executed in order to be able to produce similar effects from geometrical drawings, outlines are the best. But if we are wishing to carry away memoranda of massing and general effect, or of details, this is more effectually and rapidly done by means of shaded sketches.

The necessity of following out, as far as possible, the advice contained in the second part of our motto, is one which we shall, no doubt, all be ready to admit. It is desirable, apart from any question of truth or honesty, in the interests of art, for nothing can be really beautiful unless it is true. The beauty that is attained in a building by honestly expressing the arrangements and requirements of the interior ought to be of more value than that which is obtained when the necessities of the interior have been sacrificed to produce it. And this honesty of expression as regards the elevation of a building is the chief thing to be considered, because there is, I think, no more necessity, as a matter of principle, to insist upon the details of construction in architecture being shown for the sake of truth and honesty, than there would be for insisting upon our seeing the framework or skeleton of every leaf and flower that grows, and of every being upon the face of the earth. There can be no objection, but rather the reverse, to cover up, clothe, and decorate the rough unsightly forms which compose the framework of a building, whenever desirable, and it only becomes wrong to do this when the covering is used to disguise and apparently alter the forms, and not merely to cover them, or when it is done with any intent to deceive.

The requirements of modern building unfortunately often compel us to do things which are and cannot but be most unsatisfactory, artistically speaking, such, for instance, as the small supports and wide openings filled with plate glass, which are required in shop-fronts. It is impossible to make anything decent of this sort of thing, either by showing the supports and girders, or by casing them; the latter plan, I think, generally preferable, for several reasons.

But there really are very few cases in which an architect is tempted to disguise his construction in any way, and it is always made more satisfactory to ourselves so to proportion our work as to satisfy the eye and mind of the observer. Then, with regard to truth in finishing and decoration, for similar reasons it is quite permissible to clothe and cover up any common material for the purpose of adding a better surface. Why should it have been thought almost wicked to plaster the walls of churches, as it was some time since? If one cannot afford to build the walls with a material which has a sufficient finish for an inside lining, it is much better to plaster them. There is no deception done, or intended to be done. The question of painting in flat colours *v.* graining has been often considered, and the flat colouring is generally voted the more artistic treatment. There are many advantages in the other method, but although it rarely does deceive, whatever may be the intention, we must not hesitate to condemn it on principle; and, as a general rule, the treatment of one material in more or less direct imitation of any other is to be deprecated.

I think it was Professor Roger Smith who has paraphrased the language of Demosthenes in saying that the three chief qualifications in an architect are, "1st, Drawing; 2nd, Drawing, and 3rd, Drawing." This, no doubt, is very good advice, but I think it requires a certain amount of modification. There is a great danger, nowadays, of falling into the opposite error of forgetting that our drawings, after all, are but a means to an end, of making them as if they were merely intended for pretty pictures, and not as an honest attempt to show a building as it would appear. This is what another learned professor said upon the subject:—

"Let architects be sober in their designs, let their drawings be made so as to represent the building as the building would be when it was built, eschewing all those tricks and peculiarities of draughtsmanship which were so charming in a picture or an etching. Then if the building were bad in design it would appear bad in the drawing. A great deal of bad architectural work at the present time was to be attributed to nothing more than the self-deception of the designer by his draughtsmanship."

Now we have in these two opinions some apparently opposite views upon the subject. The one seems to magnify unduly the necessity of drawing, and the other implies from the cautions conveyed that the drawing of the present day is frequently made too much of; that the draughtsman, in his desire to make a pretty and attractive drawing, entirely overshoots the mark and deceives himself as to the effect that will be obtained when what he is supposed to be representing is carried out in brick and stone. This over-elaboration in drawing,—this, so to speak, wilful perversion of the truth,—is no doubt to a great extent the outcome of the system of perpetual competition under which architects now suffer, and in these cases we can only look to the forthcoming rules and regulations for the remedy. We must, I think, all admit the necessity for caution in this respect, and bear in mind, as architects, that as a good design may undoubtedly be marred and spoiled by bad drawing, we must be able to express our ideas upon paper so as to convey a correct impression of our building; but we must never allow ourselves to be carried away by the desire to make a pretty picture only, and deceive ourselves as well as our clients. Manual dexterity is, no doubt, a very good thing, but it may be made too much of, and mislead woefully, and in any case it plays a secondary part to that more important qualification, a correct and well-trained eye.

It should be the aim and object of all architects so to refine and elevate their work that it may show to an educated observer unmistakable evidence of the thought bestowed upon it. In proportion as this is the case does the building rank as a work of art, and in that degree may its designer lay claim to the title of artist.

The world has lately been informed by a great legal authority that architects can have no claim to that title, not so much even as a hairdresser; and why? Because they do not work with their fingers. It is hardly worth one's while to take any notice of such a statement. We all know that real architects do occasionally have to use their fingers. I only refer to the subject because I have been at some pains this evening to impress upon you that it is the spirit of our work that is of the greatest value, and that the fingers are but agents,—most necessary ones certainly,—to convey it from the mind and eye on to the paper. It must also be observed that the power of fully appreciating, as of producing, beautiful works is not acquired by study of the law, or of mathematics, or even of campanology, but by careful and loving study of the beautiful in nature and art, and an earnest desire to apply the principles learned to our own work.

I have endeavoured, in putting down these few thoughts for your consideration this evening, to touch upon some of those matters which, whether as architects or students, should ever be uppermost in our thoughts. It is both pleasant and profitable for each one of us, amid the hard matter-of-fact details of everyday life, to study and think them out for himself.

The message of art always remains the same; there is nothing new in what I have said,—scarcely, I fear, in the manner of telling it,—but it is, I may hope, not without some use to have again reminded you of these things. I cannot do better than conclude with the words of a great artist:—

"Excellence is never granted to man but as the reward of labour. If you have great talents, industry will improve them; if you have but moderate abilities, industry will supply their deficiency. Nothing is denied to well-directed labour: nothing is to be obtained without it."

Mr. Stannus, in moving a vote of thanks to Mr. Hayes for his address, referring to the so-called "Queen Anne" style, said it was quite true that, as the President had stated, it had a wide range of design,—far too wide a range, indeed,—and one which, it was to be hoped, would be considerably narrowed before long. He thought there were already signs of a movement in the direction of limitation, some of the men who had set the fashion going being probably alarmed at the terrible Frankenstein which they had caused to arise. Having passed through the dregs of corruption and dirt, it was to be hoped that it would gradually be purified and led into that style of pure Classic to which they were all tending, and to which they, with some exceptions, looked forward with a very great deal of pleasure. ("No, no.")

Mr. S. Flint Clarkson seconded the motion, which was supported by Messrs. J. Osborne Smith, Aston Webb, and Cole A. Adams, and carried by acclamation, Mr. Hayes making a few observations in reply.

A NOTABLE REREDOS.

We have had an opportunity of seeing, at the studio of its sculptor, Mr. G. W. Seale, Coldharbour-lane, Brixton, a reredos which is noteworthy not only on account of the elaborateness of its design and the excellence of its workmanship, but from the probability that it is the largest work of the kind executed in this country since the Reformation. It has been modelled and executed by Mr. Seale from drawings made by Mr. J. D. Sedding, architect, of Charlotte-street, Bedford-square, and its total cost will be about 2,000*l*. It is about to be erected in the Church of St. Clement, Bournemouth, at the cost of Mr. J. F. Christy, in memory of his son, Lieut. Edwin Christy, of the 8th Hussars, who, after passing scatheless through the recent Afghan war, had the misfortune to meet with a fatal accident while playing a polo match in India about two years ago. The reredos consists of a central portion, which will be erected beneath the east window, flanked on either side by a structure of panelling and canopy-work rising to the springing-line of the arch of the window. The central portion,—the reredos proper,—is about 15 ft. high from the level of the footpace, and 13 ft. in width. Above the re-table there is a long panel of sculpture in alto-relievo, representing the Adoration of the Shepherds and the Adoration of the Magi, combined in one subject. This panel is 11 ft. 4 in. long and 4 ft. 6 in. high, the figures contained in it being about two-thirds full-size. Above the framework enclosing the panel is a row of niches, containing the twelve apostles,—these figures being on a much smaller scale than those in the panels. Above this row of niches there is a boldly-coved cornice, vaulted on its under-side, and surmounted by open brattishing. It has been sought to treat the subject of the large panel in a natural though withal a devotional manner, and the same sort of pictorial effect as is seen in Adam Krafft's sculpture at Nuremberg has been aimed at, with no small degree of success. This panel is in Caen stone, but the remainder of the central part of the reredos is in alabaster. At each end of the panel is a triple shaft; one of these shafts is surmounted by a figure of the Blessed Virgin, and the other one by the angel Gabriel announcing the Incarnation. In the centre of the upper frieze is a boldly-projecting canopy, which will come over the altar-cross, after the manner of the one at Winchester Cathedral. The flanking portions of the reredos will rise, as we have said, to the level of the springing of the east window,—*i.e.*, to the height of 26 ft. 6 in., the aim of the architect having been to attain somewhat of the effect of the fine examples at Winchester, St. Mary Overy, St. Alban's Abbey, and Christ Church, Oxford, where, as in the work now under notice, the reredos extends across the whole width of the church. Each of the flanking portions is composed of panelling, divided into three vertical spaces in each stage by moulded shafts, the central compartments being larger than the outer ones. These central spaces contain, one above the other, two large and prominent figures on each side of the chancel, standing in canopied niches. The smaller spaces on either side of the large spaces contain a number of smaller niches filled with figures of saints,—all characteristically treated and with their several emblems. The dado next the ground is of the same height as the altar, and is divided into compartments corresponding with those in the upper part. Under the cresting of the dado is the inscription describing the purpose of the memorial, and on the right-hand side is a square panel containing a figure of the deceased on horseback in his regimental dress. The four large figures we have mentioned are those of St. Edwin, St. George, St. Edmund, and St. Alban. There are in all twenty smaller figures. We may add that the whole of the work was modelled by Mr. Seale. Mr. Philip Westlake supplied the cartoons for the large figure subjects, so that they might correspond in scale with the figures in the stained-glass window which is also being given to the church by Mr. Christy in memory of his son. The style is Early Perpendicular, corresponding with that of the church, of which Mr. Sedding was the architect.

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ARCHITECTS AND SURVEYORS.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.

At the annual meeting and *conversazione* of this Association, held on the 7th inst., the President, Mr. J. J. Bateman, delivered an address, in which he particularly considered "that portion of our professional practice connected with the duties of a surveyor," and he divided the subject into,—first, those surveyors' duties immediately connected with the practice of an architect; second, those connected with the practice of a surveyor. Connected with the practice of an architect were land surveying and levelling, landscape gardening, development of building estates, and legal knowledge respecting easements, Acts of Parliament affecting building, law of contracts, dilapidations and fixtures. Connected with the practice of a surveyor were valuations of property, parochial assessment and compensations. The more important of these points he discussed in detail. Respecting landscape gardening, which was, he said, a study essential to the architect, he addressed to the students a few hints upon suburban gardening. The house was to be placed upon a well-developed terrace. They were not to be too ambitious in the style of the garden; the simpler the plan, the greater its effectiveness. Unnecessary divisions, multiplicity of flower beds, numerous walks, and vases and pedestals (except in special situations) were to be avoided. The surface of the ground would determine the character of the plan, whether "rectangular" or "curvilinear." Without special observance of aspect, no garden arrangements would be successful. Lastly, the main approach or carriage-drive should be planned so as to give the greatest amount of privacy. Greater scope for design would be afforded by country houses, where the distant view, the introduction of water, the terrace flower-garden, the grouping of timber, garden architecture, in fountains, picturesque bridges, arbours, and other ornamental buildings, balustrades, and numerous other embellishments, might tend to the one object of heightening the architectural effect of the mansion. To the branch of his subject classed as "Legal Knowledge," Mr. Bateman devoted a large part of his paper. In "easements" which were prescriptive rights acquired by time and use, the most important was that of light. No subject connected with the architect's profession was more fruitful of vexatious litigation than rights of window-lights, as few buildings of importance could be erected in the centre of a closely-built town without their architects being embarrassed by the obstructive interference of adjoining owners. The strict right of property entitled the owner to so much light and air only as fell perpendicularly on the land. Happily for Scotch architects the law of Scotland was so limited; but in England the right of light in a lateral direction was protected and called an easement if it had existed for twenty years, when it became an "ancient" light. It was, however, a moot point if railway companies could prevent adjoining owners from the enjoyment of light over a railway. The law permitted the opening of windows over adjoining land, but the adjoining owner could obstruct such windows within twenty years by an erection on his own land. He was of opinion that the repeal of the law permitting windows to open over adjoining land might very profitably be considered. At present the law admitted of an encroachment on the rights of adjoining owners, which by lapse of time became an easement or legal right. It certainly appeared to be a legal anomaly to admit a right to one party which might be cancelled by another, although the cancelling might necessitate great inconvenience, expense, and loss. It was true easements of light might be obtained by building within the boundary of the property, and this would be to exercise a just and equitable right of property. An ancient light could not be prejudicially affected, and the Courts had frequently ruled that no obstruction should exceed an angle of 45 degrees; but scarcely any two cases of damage to light were alike. It was a wise precaution to erect a temporary obstruction before proceeding with the permanent work, as a test of what, if any, damage would be caused. Another easement to which Mr. Bateman referred was that of "support," which entitled an owner to the lateral support of adjoining land; whilst for the support of buildings a twenty years' user must have been acquired. Referring to Acts affecting building, the President said it was much to be regretted that there was not in Birmingham a comprehensive Building Act, which would relieve architects of considerable difficulty in dealing with party-walls and other vexatious questions, and at the same time ensure the erection of more uniformly substantial property. He recommended the study of the Metropolitan Buildings Act, which regulated all building operations in the metropolis to secure sound construction and protection from the spread of fire. Town Improvement Acts, where they existed, were also necessary to be studied. As to the Artisans' Dwellings Act, he remarked that it might fairly be questioned whether the Corporation had legitimately used this Act in forming Corporation-street. He referred to this to correct any erroneous impression that this Act was intended to be used for the purposes of street improvement instead of the improvement of artisans' dwellings.

THE TRANSIT OF LANCASHIRE COTTON GOODS.

Sir,—It is satisfactory to know that the great importance of the question of reducing by some means the cost of inland conveyance of Lancashire cotton manufactures is at last receiving the recognition it deserves. To fully understand this importance it is only necessary to examine the statistics relating to the increase of production of the cotton manufactures of our foreign, and especially American, competitors. The inland position of the cotton industry of Lancashire owes its origin to its peculiar introduction and development. The exiled Flemish weavers, driven from their homes by the revocation of the edict of Nantes, were welcomed by the fustian-weavers of Lancashire. Years after, thanks to the genius of a galaxy of inventive weavers, Lancashire could supply not only home consumers, but a greater part of those abroad, with calico, and the Lancashire manufacturers had, up to the time of the great Exhibition of '51, very few, if any, foreign competitors, and at that time it was immaterial whether their mills were inland or on the seaboard. But now all this is changed, and the change may be partly attributed to our too great readiness to exhibit the products of British ingenuity before the imitative eyes of foreigners, and now Lancashire manufacturers will have to face ever-increasing foreign competition. Compared with the Americans, it will be readily conceded that the Lancashire manufacturers are at a great disadvantage. The former are now commencing to erect their mills actually in the cotton fields, so that the raw material can be cultivated and manufactured *in situ*. The cotton is then, at little expense, transmitted by rail or river steamer to the ocean liner, to be carried direct to all parts of the world, and no doubt the enterprising Americans will eventually utilise, by electrical transmission, the great natural sources of power so common in their land. And then the fertile and luxuriant character of the American soil allows them to obtain comparatively cheap labour. The Yankee knows his natural advantages over his Lancashire competitor, and by the increased production of American cotton goods he is proving that he intends to utilise them, and it must be confessed that, naturally selected, the Southern States of America are pre-eminently adapted for both the cultivation and the manufacture of cotton.

The Lancashire cotton manufacturer has all the expenses of river and ocean shipments, transit by road and rail, loading and unloading various times, before he can even touch the raw material. And then there are the brokers' charges. These latter, however, the Lancashire manufacturers appear determined to remove, and some of the cotton-spinners of Oldham have already banded themselves together in order to buy cotton direct without the intervention of the middlemen or cotton brokers. Several important schemes have lately been announced, having the aim of reducing the cost of inland transit of the Lancashire manufacturers. Certainly the most important of these schemes is the suggested ship-canal, which, if carried out with vigour to a successful issue, would ensure at least a moderate degree of prosperity for the cotton trade of Lancashire for many years to come. But this is not all. Its effect upon other Lancashire industries,—especially the chemical and iron,—would be equally as beneficial, and in time its banks might become studded, like those of the Clyde, with works of the textile, iron, and ship-building industries.

The importance of a seaboard position for other industries than that of cotton is, in the face of foreign competition, beginning to show itself, and Messrs. Cammel are, with commendable enterprise, removing their ironworks from Sheffield to a seaboard position in Cumberland.

Another scheme for improving the means of conveying Lancashire manufactures is that described as the Lancashire plateway. This scheme appears, however, to be too crudely developed to deserve any attention. Would it not be possible and better to connect the tramways existing in nearly all the Lancashire towns with the railways, so that the trucks of a light and special character could be drawn at once, from the railway to the mill or the ship? If the railway companies could only see that, by high and excessive tariffs, they were driving the staple trades out of the country, they might make some endeavour to reduce their tariffs to something like a reasonable proportion, otherwise they will discover when only too late that they have been perpetuating the folly of killing the hen that laid the golden egg. The future of Lancashire will be seriously influenced for good or evil by the degree of energy devoted to the work of improving at once the means of inland conveyance of her manufactured goods, and it behoves all Englishmen to wish success to any scheme that will ensure this desideratum.

B. H. Thwaite, F.C.S.

LEEDS ARCHITECTURAL SOCIETY.

The following syllabus of papers is issued for session 1882-83:—

1882.

Nov. 6th.—Opening Address by the President, Mr. F. B. Fraser, F.R.I.B.A., and Annual Report.

Nov. 20th.—"Constructional Ironwork, as applied to Architecture," by Mr. F. Campin, C.E.

Dec. 4th.—"The Foundation of Art in Architecture," by Mr. E. R. Robson, F.S.A., F.R.I.B.A., Architect to the London School Board.

Dec. 18th.—The *Conversazione*.

1883.

Jan. 8th.—"The Place of Tradition in Modern Design," by Mr. J. D. Sedding, F.R.I.B.A.

Jan. 22nd.—"Kirkstall Abbey," by Mr. J. Wreghitt Connon, F.R.I.B.A.

Feb. 5th.—"Art Foliage," by Mr. J. K. Colling, F.R.I.B.A.

Feb. 19th.—"Wakefield Town-hall," by Mr. G. B. Bulmer.

March 5th.—"Hindrances," by Mr. J. Honeyman, F.R.I.B.A., President of the Glasgow Society of Architects.

March 19th.—"Recollections of Flemish Architecture," by Mr. William H. Thorp, A.R.I.B.A.

April 2nd.—Members' *Soirée*.

GLASGOW INSTITUTE OF ARCHITECTS.

PROPOSED BUILDING ACT.

At an extraordinary general meeting of the Glasgow Institute of Architects, held to consider the new Police Bill,

Mr. Wm. Maclean, writer, the secretary, read the report of the Council of the Institute on the Police Bill. The report contained the following passages:—

The Council of the Glasgow Institute of Architects having considered the sections of the new Police Bill from 307 to 332 inclusive, relating to the jurisdiction and procedure before the Dean of Guild Court, Master of Works, his powers and duties; streets and courts, sewers and buildings, their erection, alteration, and use, are unanimously of opinion that these sections should be omitted from the Police Bill, and that all necessary building regulations should be embodied in a Building Act applicable not merely to the city, but also to the suburbs. The growing need for such an Act to regulate building operations in this large city has been apparent to the architects of Glasgow for many years. In 1878 and 1879, in particular, the subject was discussed at numerous meetings, and a deputation from the Institute had several opportunities of conferring with a committee of the Town Council which had this matter under consideration. At that time it seemed probable that the different municipalities would co-operate with the view of promoting a general Building Bill applicable to the whole of Scotland,—a course which the Institute warmly approved and recommended,—but the scope of the measure now under consideration proves that the Town Council has entirely abandoned all idea of proceeding with a Building Bill either in conjunction with other corporations or separately. Instead of that they propose to mix up building laws with the miscellaneous provisions of a Police Bill, in such a way that the original mistake of so doing

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shall be perpetuated and aggravated. . . . . With the view of bringing the opinion of the Institute before the Town Council in a formal manner, your Council submit for the approval of the general body, the following resolutions:—1st. That it is expedient that the clauses relating to buildings and the jurisdiction of the Dean of Guild be omitted from the Police Bill. 2nd. That the laws relating to buildings should be consolidated and amended by a new Act dealing with that special subject, similar generally to the Metropolitan Buildings Act, and applicable to the suburbs as well as to the city of Glasgow. 3rd. That inasmuch as it is impossible for the Town Council or the ratepayers either to consider the advantages of the course now proposed by the Institute, or the merits of the draft Bill now published, before the day on which Bills for next session must be lodged, therefore the Institute protests against the Town Council giving notice of their intention to proceed with the Bill at this time. 4th. That a copy of the foregoing resolutions be forwarded to the Town Council.

The report and resolutions, on the motion of the President, Mr. James Thomson, seconded by Mr. James Salmon, and supported by Messrs. James Sellars, Jno. Hamilton, and Campbell Douglass, were unanimously adopted.

LIVERPOOL ENGINEERING SOCIETY.

At a meeting of the above Society, held at the Royal Institution, Colquitt-street, on Wednesday evening, the 8th inst., Mr. F. B. Salmon, president, in the chair, a paper, by Mr. C. E. Hannaford Shiel, M. Inst. C.E., on "The Testing of Materials for Use in Engineering Structures," was read. In the paper the author, for want of space, dealt with only two classes of materials, viz., limes and cements, and metals. He selected these on account of there being many differences of opinion with respect to some of the methods of testing, and therefore will, he hopes, leave more matter for a discussion thereon. After relating briefly the usual tests applied to hydraulic limes, with a view of ascertaining their quality, he passed on to Portland cement. In dealing with this material, reference was first made to the different methods of manufacture, after which he described at some length the various tests to which it should be subjected, including comprehensive and tensile strength, fineness of grit, weight, colour, &c., and then pointed out that by actually breaking a sample by either tension or compression is given the most reliable information of its quality. He then described, and showed by the aid of diagrams, the various forms of briquette which have been used at different times, giving the preference to the last form introduced by the Metropolitan Board of Works as being the one he believed calculated to give the most accurate results. He then entered at some length into the various methods of making the briquette, the amount and nature of the water found most beneficial under different conditions, and other details, and concluded this section with some remarks on the utmost necessity in comparing the relative strengths and other properties of two or more samples, that all the details of gauging and manufacture should be as nearly as possible identical. In dealing with the section on metals, the author described the various but usually applied tests to cast and wrought iron and steel, pointing out several tests which, although occasionally resorted to, are, in his opinion, to be condemned. In referring to the forge test of the last two metals, he quoted the latest tests required by the Admiralty for these metals, and concluded this section with a review of the connexion which exists between the chemical and mechanical quatities of iron and steel.

The Society of Arts' House, Adelphi.—During the recess the Society of Arts' House has been renovated under the superintendence of Mr. E. C. Robins. The great hall has been redecorated in the style of the work of the Brothers Adam, raised mouldings being added to the cove, well accentuated in gold and colour, with the effect of increased height. The hall has also been ventilated by the introduction of fresh air over warm-water pipes, and the extraction of expired air by a shaft 3 ft. square, heated above the level of the meeting-room with hot-water pipes. The result is expected to be the change of air in the meeting-room three times in the hour, with the maintenance of 60° of temperature, Fahr. The lower hall has also been decorated and ventilated in a similar manner. The electric light has been introduced, and is in course of regulation.

COMPENSATION CASE.

CHAMBERS *v.* METROPOLITAN AND DISTRICT RAILWAY COMPANIES.

The claimant in this case (tried in the Lord Mayor's Court before the Recorder and a special jury) sued for compensation in respect of his interest in premises held by him on lease, situated in Black Raven-court, Seething-lane, and which were required by the railway companies in consequence of the extensions now being carried on.

The claimant is a wine-merchant. He took the lease in March, 1880, for twenty-one years at a rental of 70*l.* per annum. He had expended 300*l.* in repairing the premises. They were now in good repair, and in consequence of their proximity to the markets, of considerable value. He had let off the house at a yearly rental of 130*l.* He now claimed 700*l.* as compensation.

Mr. S. Chambers, the claimant, stated that he obtained the lease of the house in question on March 25th, 1880. He had expended 300*l.* in repairs. He had let the house under an agreement at a rental of 130*l.*, the lessor paying taxes. Cross-examined: He took the house for a speculative purpose. When he took the lease he did not know the railway companies were coming.

Mr. R. G. Bishop (of the firm of Messrs. Smallpeice & Bishop), surveyor, Godliman-street, said he had a large experience in the district in which the house in question was situated. He superintended the final repairs which had been done, and gave the final certificate. His valuation amounted to 676*l.* 10s.

Mr. J. F. Field, surveyor, Bread-street, valued the premises as worth, on compulsory sale, 712*l.*

Mr. E. Eason (of the firm of Messrs. Reynolds & Eason), surveyor and auctioneer, Bishopsgate-street, said that in his opinion 704*l.* was the fair value of the property.

Mr. Pollock, on behalf of the companies, called Mr. Lang (of the firm of Messrs. Jones, Lang, & Co.), auctioneer, King-street, Cheapside, who valued the property at 302*l.* 10s.

Mr. George Low, architect and surveyor, Basinghall-street, gave as his valuation 302*l.* 10s.

Mr. R. Ritchie, architect and surveyor, Parliament-street, said he acted for the railway companies in the acquisition of the property. He considered the value of the property to be 300*l.*

The Recorder having summed up, the jury were of opinion that the plaintiff was entitled to 484*l.* as compensation.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

5,250. W. D. Scott, Moncrieff, and W. Dodds, London. Valve apparatus for supplying baths, &c. Nov. 3, 1882.

5,259. A. E. Crisp, London. Window-fasteners. Nov. 4, 1882.

5,266. R. Chapman, Patricroft, and J. Hibbert, Manchester. Apparatus for closing doors and windows. Nov. 4, 1882.

5,274. A. M. Clark, London. Means for attaching hat-pegs, curtain-holders, brackets, &c., to walls and ceilings. (Com. by MM. Gollot Frères, Paris.) Nov. 4, 1882.

5,283. W. Kennedy, Glasgow. Translucent plates as substitutes for glass in roof-lights, &c. Nov. 6, 1882.

5,310. J. G. Whyte, Bo'ness. Construction of cooking-ranges, &c. Nov. 7, 1882.

5,347. R. Crane, London. Smokeless stoves and grates. Nov. 9, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named:—

Nov. 7, 1882.

3,170. T. G. Webb, Manchester. Pavement lights, &c. July 5, 1882.

4,495. W. R. Lake, London. Manufacture of bricks. (Com. by H. R. Dickinson, Hamilton, U.S.A.) Sept. 20, 1882.

5,165. A. M. Clark, London. Gas cooking stoves or ranges. (Com. by W. W. Goodwin, Philadelphia, U.S.A.) Oct. 30, 1882.

Nov. 10, 1882.

3,140. T. French and J. Monks, Manchester. Ladder tapes for Venetian blinds. July 4, 1882.

3,242. J. Carr, Hulme. Tape ladders. July 8, 1882.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending November 11, 1882.

1,466. W. L. Fison, Stowmarket. Perforated tiles. March 27, 1882. Price 2d.

The undersides of these tiles are strengthened by parallel ribs. (*Pro. Pro.*)

1,522. J. B. Denton, London, and G. Butler, Turnham-green. Apparatus for flushing sewers, &c. March 29, 1882. Price 6d.

A syphon is fitted in a tank, to the long leg of which is connected a valve governed by a tipping-box or bucket in a smaller chamber contained in the tank. As the tank overflows it fills this chamber, and this in turn fills the tipping-box. This then raises the valve and water flows into the long leg of the syphon, setting up the action, which empties the tank into the sewer.

1,544. C. F. Grimmett and J. Cook, Birmingham. Curtain suspenders. March 30, 1882. Price 2d.

The rings have a clip, between the jaws of which the curtain is suspended. (*Pro. Pro.*)

1,568. F. Render, Manchester. Manufacture of bricks, tiles, &c. March 31, 1882. Price 2d.

To make firebricks, &c., silica brought to a gelatinous state is added to the ground clay. (*Pro. Pro.*)

1,575. W. R. Lake, London. Metallic roofing shingles. (Com. by R. Seaman, New York, U.S.A.) March 31, 1882. Price 6d.

These are diamond-pointed shingles, which have a central longitudinal rib formed in them, which creates a groove on their undersides. These grooves are widest at the points of each shingle, and therefore the rib of one shingle will enter the rib of the next shingle above it. The parallel edges of each shingle are also turned up to dovetail in the groove of the central rib.

1,584. G. L. Shorland, Manchester. Fire-places or grates and stoves. April 1, 1882. Price 6d.

A box is fixed behind the front bars of the grate for warming air. The inlet pipe of this box conveys air from outside the building, and delivery pipes from the upper part of the box deliver the warm air into the room, &c. The gases of combustion are made to pass again through the fire to two flues, which are fitted with dampers.

1,589. M. Meuge and H. Krause, Berlin. Apparatus for painting the interior of houses, &c. April 1, 1882. Price 2d.

For painting floors a colour receptacle is attached to the lower end of a handle carrying a brush through openings in which the colour falls on the floor, and is distributed by the brush. (*Pro. Pro.*)

1,596. W. Johnson, Liverpool. Latches or locks. April 1, 1882. Price 2d.

The handle is fastened by a slotted washer catching in a groove in the spindle. A cam is placed on the spindle so that the bolt can be drawn by pressing or pulling the handle instead of turning it round. (*Pro. Pro.*)

1,609. F. H. F. Engel, Hamburg. Parquet flooring. (Com. by F. H. Schmidt, Altona, Prussia.) April 3, 1882. Price 2d.

The veneers are cut to shape by a circular cutter, the supporting frame of which is provided with a bed on which is a sliding table. This table is moved so that the saw will cut the veneer exactly. The portions of veneer are then arranged and glued on the ground-board and a press with two jaws fastens them to the board. (*Pro. Pro.*)

1,652. J. J. Wheeler, London. Curbs of roads and footpaths. April 5, 1882. Price 4d.

These are made of artificial stone, granite, or iron, and an internal way or channel is formed in them for conducting wires for electrical purposes.

1,655. H. Conolly, London. Water-closets. April 5, 1882. Price 4d.

The overflow arm communicates with the flushing rim in such a manner that every time the closet is flushed part of the water will pass through the overflow arm and seal the trap.

1,694. C. F. Grimmett and J. Cook, Birmingham. Cornice-poles, curtain-suspenders, &c. April 8, 1882. Price 6d.

A wire is coiled round the cornice-pole, half of the coil being right-handed and half-left-handed. From this the curtain is suspended. When the pole carrying the wire is revolved the curtain is carried backwards or forwards. Several modifications are shown.

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

NEW BOARD SCHOOLS IN LONDON.

The London School Board have given notice of their intention to procure sites for the erection of forty-four new school buildings, in addition to 311 schools which they have already erected in different parishes within the Metropolitan area. The building of these proposed new schools will involve the removal of a considerable number of houses, and the consequent displacement of a numerous population. In the Middlesex portion of the Board's area, twenty-eight new schools are proposed to be erected. Of this number, eight are in the Chelsea division, five of which are in the parish of Fulham, two in the parish of Hammersmith, and one in the parish of Chelsea. The sites to be purchased for these proposed schools cover a total area of eight acres, and involve the demolition of thirty houses. Without continuing further the detail, the aggregate area covered by the sites of the several proposed schools is upwards of forty acres, and the number of houses required to be taken down 810, involving the displacement of a population estimated at about 2,000 persons.

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THE SERIOUS LANDSLIP AT THE DENMARK HILL RAILWAY STATION.

THE great landslip at Champion-place, on the south side of the Denmark-hill station of the South London Railway, the property of the London and Brighton Company, now threatens to be more serious than it has been within the last few months, during which a large number of men have been at work repairing the damage done to that part of the cutting on the south-east side of the station.

The railway retaining-wall is immediately to be taken down, as it is at present in a highly dangerous condition, whilst it will also be necessary to take up the roadway in Champion-place for the purpose of re-constructing the sewer, and also in order to restore the road to its former level.

Works already done have been executed by the London and Brighton Company, under the immediate superintendence of Mr. Banister, their engineer, at a cost of between 7,000*l.* and 8,000*l.*; and it is expected that a further large outlay will have to be incurred in the necessary works on the south-west side of the station.

It is not improbable that the matter may lead to some litigation between the railway company and the Camberwell Vestry, the railway company apparently being of opinion that the slips have been caused by the imperfect drainage of the roadway above, under the control of the Camberwell authorities.

NEW WATERING AND SANDING MACHINES IN LONDON.

SOME of the metropolitan vestries have just introduced what appears to be an improved and more expeditious system of watering and sanding the public thoroughfares. Last week the Works Committee of the Westminster Vestry met for the purpose of witnessing the trial of two new watering and sanding machines, which have recently been invented and patented by Mr. Robert Willacy, of Preston. The trial took place in the neighbourhood of the Abbey, between three and four o'clock in the afternoon of Wednesday, and was witnessed by a large body of spectators, in addition to the committee of the vestry. The sanding-machine was first tried, the trial commencing at the door of the Vestry Offices in Great Smith-street, and thence coming round in front of the Abbey along Parliament-street, and into Bridge-street. One of the advantages of the invention appeared to be the great width of roadway sanded, 30 ft. in width being covered at one journey, and Bridge-street, which is about 60 ft. in width, being covered during the first and return journeys in a few minutes. The watering-machine was next tried, and distributed the water at one movement to the extent of 32 ft. in width. The trials showed that streets of ordinary width can be entirely covered by water or sand without doubling, thus saving much time and expense. The trials were so satisfactory to the Westminster authorities that they decided upon adopting the sanding-machine, which the inventor has been instructed to supply. The committee expressed themselves equally satisfied with the watering-machine, but have not yet adopted it, as they are at present under a three years' contract for the machines at present in use.

LIABILITY OF ARCHITECTS GIVING ORDERS FOR GOODS.

METCALF *v.* MYRES.

IN this case (heard in the Preston County Court on the 25th ult., before Mr. W. A. Hulton, judge), Messrs. Metcalf & Dilworth, hot-water engineers, Preston, sued Messrs. Myres, Veevers, & Myres, architects, Preston, for 32*l.* 10s., the value of a hot-water heating apparatus.

The defendants were a firm of architects in Preston. They had to do with the erection of some Local Board offices at Walton-le-Dale, and in October, 1880, one of the defendant firm, Mr. T. H. Myres, waited upon one of the plaintiffs, Mr. Dilworth or Mr. Metcalf, and requested to be shown some heating apparatus for the offices. The result of this request was that a tender was sent in to Messrs. Myres, Veevers, & Myres. At that time the plaintiffs were not informed who was the contractor for the erection of the offices. The whole of the correspondence on the subject, the interviews and arrangements which took place, had been made with Mr. T. H. Myres and the firm. The work was completed, and then application was made for payment to Mr. Myres, and he believed that at Mr. Myres's request Mr. Metcalf saw Mr. Ward, the builder, and asked him for payment. This was done expressly at the request of Mr. Myres, and he told Mr. Ward that he should be glad if he could see his way to pay him, but if not, he should look to Mr. Myres for payment of the amount. The question was whether or not they could recover the amount from the architect.

On the 7th inst. his Honour delivered the following written judgment:—

This action has been brought to recover 32*l.* 10s., the price of a heating-apparatus and other goods, furnished by the plaintiffs to the Local Board offices at Bamber Bridge, under the following circumstances:—In the year 1880 the Local Board of Walton-le-Dale were erecting new offices at Bamber Bridge, and they entered into contracts with various persons with relation to the building of such offices. The defendants in the present action acted in the erection of the offices as architects for and on account of the Local Board. It was found necessary that a heating-appartus should be set up in the offices, and the plaintiffs tendered for it, and, after a reduction in the price, the tender was accepted by the defendants, and the work was proceeded with. During the progress of the work, the boiler to the apparatus was changed, and a more expensive boiler was supplied by the plaintiffs on the order of the defendants. In the same manner an ornamental cover to a coil in one of the rooms in the offices was ordered by the defendants, and supplied by the plaintiffs. It appears that a contract for the supply of a heating apparatus to the offices had been entered into by one Mr. Ward with the Local Board. It further appeared that the contract price of the apparatus had been paid to Mr. Ward, and the question now is,—for Mr. Ward is unable to pay,—whether the defendants are liable. I think they are. It was the duty of the defendants, under the circumstances, to be very careful to leave no doubt on the minds of the plaintiffs as to the parties with whom they were dealing; and if any other persons than the defendants were concerned in the contract, notice of that fact ought to have been expressly given, and in the fullest terms, to the plaintiffs. In this case, both the plaintiffs positively asserted that they did not know of Ward's contract till long after the apparatus was finished. And though Mr. Myres stated that he had informed the plaintiffs of the contract, yet the communication was evidently not sufficient to give the plaintiffs the notice required. There was no question at the hearing as to the liability of any other party. I do not consider that the plaintiffs can be held to have elected to have taken Ward as their debtor. And as there is no doubt that the contract was made and the orders for the goods given by the defendants, and no authority from any other party to do so was shown to exist in the defendants, I must hold that they are liable to the plaintiffs, and that this action is maintainable. A question arose at the hearing whether the tender made by Ryley had the effect of altering the position of the parties. I think it had not. The whole sum tendered was offered to be taken on account, and the offer was refused. The effect of the tender, if any, was thereby put an end to. I direct the verdict to be entered for the sum of 31*l.* 10s., the amount of the sum due for the heating apparatus being reduced, according to the contract agreed upon.

PROVINCIAL NEWS.

Gorton, Manchester.—A large block of general offices is now being erected for Messrs. Beyer, Peacock, & Co., engineers, at Gorton Foundry, opposite the Manchester, Sheffield, and Lincolnshire Railway works. The building occupies an area of 224 ft. by 44 ft., by about 42 ft. in height, and will be faced with red pressed bricks, having moulded arches and cornices; stone string-courses, cappings, &c.; and all the internal woodwork will be of pitch pine, varnished. It comprises a very complete range of private offices, a large office for clerks on ground-floor, 70 ft. by 40 ft., by 16 ft. high, with separate room for cashier and fireproof safe; and on the first floor a general drawing-office, 90 ft. by 40 ft., by 24 ft. high, with open roof and glazed central double light in addition to the side windows; also a separate tracing-office, photographing-room, model-room, &c. Arrangements have been made for warming and ventilation, on Messrs. Haden's system, for which a special smoke and ventilating shaft is provided at one end, rising to a height of 80 ft.; and at the other end of the buildings will be a clock-tower, 90 ft. high. Messrs. T. Bates & Co., of Droylsden, are the general contractors for the work, which is being carried out according to plans and directions of Messrs. Worthington & Elgood, architects, 110, King-street, Manchester.

Ancoats, Manchester.—An important improvement is being carried out by the Manchester Corporation in connexion with the bridge crossing the canal in Ancoats. The bridge has been entirely reconstructed from the designs of Mr. Allison, the city surveyor, so as to give a roadway 60 ft. wide and to cut off an awkward bend. Some difficulty has been experienced in carrying out the work in order to avoid encroaching upon the towing-path beneath or an interference with the canal locks adjoining, but this has been successfully overcome. A rearrangement of the water-main, which was previously carried on the parapet outside the bridge, has also been necessary, but by providing a special casting for the main, of an oblong section, it is now supported underneath the bridge between the two main girders.

Salford.—The Salford Union Infirmary at Hope, near Eccles, has been opened for use. The buildings have been erected on the pavilion principle, and a continuous corridor, 850 ft. long and 10 ft. wide, connects the several pavilion blocks with each other and with the administrative block which stands in the centre, so as to be easy of access from the several departments. There are two double-pavilion blocks, which, together, will contain 400 patients, and four single blocks, each designed to accommodate 100 patients. Capacious day-rooms and other apartments have been provided. The total cost has amounted to 60,000*l.* The architect is Mr. Lawrence Booth, of King-street, Manchester, and the contractor, Mr. W. Southern, of Salford.

Bradford.—Deputations have waited upon the First Commissioner of Works, Mr. G. Shaw-Lefevre, and the Postmaster-General, Mr. Fawcett, on the subject of a site for a proposed extensive new post-office for the town of Bradford in Yorkshire. The deputation profess themselves encouraged and satisfied with the reception given by both Ministers to their representations.

Hartlepool.—Last week witnessed not only the completion of the quay-wall here, 800 ft. in length, on the west side of the new dock, but also the completion of the extensive new fish-curing houses at the north-east corner of the Slake. There are two large smoke-houses, cleaning, and salting-sheds, and every appliance for the carrying on of a business next season, which will employ about sixty men, as well as a number of females. The ice-houses are also complete and ready for use next season. Good progress is also being made with the new graving dock.

Stockport.—An exhibition of gas appliances for cooking, lighting, heating, and other purposes has been opened here, in the large weaving-shed of Spring Bank Mill, Wellington-road South, Stockport. With the view of stimulating and encouraging exhibitors and inventors the promoters offered gold and silver medals for the best and most economical cooker for working men's homes; for the best and most economical gas cooking-stove adapted for family use; for the best and simplest apparatus for preparing flour to make bread, and for the baking of it by gas; for the best application of gas for warming and ventilating purposes; for the best regulator or governor to economise the consumption of gas; for the best possible tube for the transmission of gas which will not foul; and for the best and most economical lighting of public lamps with single flame, and also with combination of flames.

To Preserve Old Country Mansions from Fire.—In *Baily's Magazine* for this month, Mr. John Birch, architect, who is restoring Everleigh House, in Wiltshire, for Sir John Astley, bart., destroyed by fire at Christmas last, makes the following suggestions for the prevention of such calamities, and for bringing the risk of fire within reasonable limits:—

"Have all flues, fireplaces, and hearths carefully examined, and all timbers too near the fires removed. Carry up the solid internal walls through the roof to a sufficient height to divide the building into sections, and so prevent an extension of the conflagration, and if possible to shut off each by sheet-iron doors, so much the better; a water-tank over each portion is indispensable, and ought to be fed from an elevated water-tower, worked by steam power. This arrangement would ensure a constant and unfailing supply to the several tanks, and the contents of the whole might be brought to bear on any one portion of the mansion. These tanks must be connected with hydrants and fire-hose on each floor, placed, if possible, in lobbies near the sheet-iron doors, and contiguous to the various staircases."

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OBITUARY.

Mr. E. B. Stephens, A.R.A., the sculptor, died on the 10th inst. The deceased, Edward Bowring Stephens, was a native of Exeter, and son of the late James Stephens, a statuary. He was in his seventy-sixth year. Speaking at the banquet given in Exeter in his honour, on the occasion of the presentation of "The Deer-stalker," the deceased sculptor said that "the Earl of Devon's father and Sir Thomas Acland's father, above all others, were the founders of his professional career, and his first friends, who helped him on cheerfully and hopefully to try and do big things, to represent that which was true, and to do that which was right." In the same speech he stated that his artistic life was begun under the guidance of the late John Gendall. He afterwards studied under the sculptor Bailey, and in 1843 gained the Gold Medal of the Royal Academy for an alto-relievo of "The Battle of the Centaurs and Lapithæ." He spent three years at Rome, and produced in succession, among other works, two groups,—"Satan Tempting Eve," and "Satan Vanquished," both of which were on view at the great Exhibition of 1851; "Eve contemplating Death," in 1853; "Group of Euphrosyne and Cupid," in 1856; and the "Angel of the Resurrection," in 1861. His grand portrait statue of Sir Thomas Dyke Acland, placed on Northernhay, was completed in 1862. He also executed for his native city the statues of Earl Fortescue, in the Castle-yard; John Dinham, on Northernhay; of Prince Albert, in the Memorial Museum; and of the Earl of Devon, in Bedford-circus. "The Deer-stalker," which now stands at the entrance to Northernhay, was exhibited at the Royal Academy in 1876. This group in bronze is generally regarded as his *chef d'œuvre*, and the manner in which Exeter became possessed of it afforded to Mr. Stephens one of the happiest incidents in his life. The work was so greatly admired by a number of Devonians that they determined to secure possession of it for the sculptor's native city. A committee was formed for the purpose of obtaining subscriptions, and though the price put upon the masterpiece was not realised, Mr. Stephens's generosity did not allow a consideration of that kind to stand in the way.

PEVENSEY CASTLE.

Sir,—In an article on Pevensey Castle, in a recent number of the *Builder*, there appear to me to be two or three mistakes committed by "G. T. C." As I have not seen any comment upon them, allow me to draw your attention to them.

The plan, which appears to have been taken from the Ordnance Survey, is scarcely correct in some parts. The middle buttress on the west side is evidently a mistake of the engraver: it is probably a shed. The plan made by Mr. Figg, and published in the "Sussex Archæological Collections," shows all the discoveries more clearly. On it are shown the wall between the buttresses of the Decuman entrance, the postern on the north side, the remains of a Roman tower and parts of the wall on the south side, where there were discovered the remains of a narrow postern. The oblique postern on the south side of the Mediæval castle, with the sunken Roman tower in front of it, are also shown. In 1783 this Roman tower had a parapet remaining round the top of it, and on the courtyard side of the postern there existed a wall on each side of the passage to it (see Grimm's drawings in the Burrell MSS., Add. MSS. 5671).

It scarcely conveys a correct idea of the postern gateway in the Roman wall on the north side, to say it passes "obliquely through the wall." Instead of its being straight, the plan of it is *curved*, which is much more ingenious, and renders it more difficult to force an entrance.

I think there is a slight mistake in saying that the mouth of a sewer has been discovered in the south wall. There was a tradition that connected Pevensey Castle with the ancient house at Westham called Priesthawes by a subterraneous passage. Mr. Lower, to prove the fallacy of it, made some excavations, and found this supposed underground passage to be a drain constructed of large stones. It was 2 ft. 6 in. below the surface, 1 ft. 6 in. high, and runs about north-west and south-east. It is shown on Mr. Figg's plan. It could not have passed through the south wall without a considerable twist.

Instead of the facing of the north wall having been destroyed by the Northmen, it is more likely that it suffered most of its destruction when Pevensey Castle was used as a quarry, which was from about the end of the sixteenth century to about fifty years ago. In 1650 the materials of the castle were sold to John Warr, of Westminster, for 40*l.*, who did not avail himself of his power of destruction. The external facing stones at the bottom of the walls have been removed for building purposes; the difficulty of raising stones compared with merely knocking them down saved the foundation from destruction. Mr. Hartshorne, in his description of Porchester Castle, in the Proceedings of the Archæological Institute at Winchester, 1845, gives a description of the Roman method of forming foundations when the ground was unsuited for building purposes, and which explains why some of the wall has fallen.

I do not know what authority there is for extending an arm of the moat northwards towards the Roman tower; it is true there is a hollow in the ground, but a moat in this direction would have offered facilities for draining it if the attacking party obtained possession of the outer ward. The moat round the Mediæval castle could scarcely be supplied with water from the sea, as it is so much above the sea level. If the moat had been supplied from the sea instead of from a spring it would not be fit for drinking purposes, to which use it was applied, for in the Burrell MSS. in the British Museum (Add. MSS. 5,682) is the following:—

"In 1710 Rev. Jn. Wright, vicar of Pevensey, Chancellor, Resr. of Chichr. for ye benefit of his pshrs. who laboured under ye inconvenience of bad water, employd Jn Pursglove, of Hurstmonceux, for his workman to convey water from the castle moat to the town, in order thereto he found it necessary to his way under the castle wall, which is very high, and the thickness be computed to be ten feet. The foundation upon wch the superstructure is erected consists of piles planked over with slabs of extraordinary substance; but, notwithstanding the long Tract of Time since the Building this weighty fabrick, there appeared no decay in the slabs, only the colour changed from what we may suppose it when they were first laid down; the leaves of faggots found there were sound. Transcribed 1782 (from a paper in ye possession of Mr. Lambert, of Lewes) by W. B."

Mr. Lower and others have been of the opinion that the walls of the inner castle were built in the twelfth century, the towers added at the end of the thirteenth century. From what I could see of the building during the short time I was there, I could not discover any difference in the character of the work in the walls and towers, and any one examining the plan would, I think, say without doubt that they were built at the same time. The following extracts from Rolls will show that the towers existed previously to 1301, or they would not have required repairing:—

"The king intending to fortify it in 1250, commanded the sheriff to compel all persons who owed service to the castle to perform the same" (Pat. 34, H. III.).

"In 1264 Simon de Montford was to have 700 marks towards his expenses in besieging the castle. In the same year the Barons of Hastings, Winchelsea, and Rye were to try diligently to capture those enemies of the king, who endeavoured to fortify this castle with men and victuals."

"The sum of 12*l.* 11s. 3½d. was allotted in 1304 for payment of the repairs of the hall and chambers of the castle done in 1301; 3*l.* 12s. 6d. for the repairs of the chapel in 1302; and 7*l.* 13s. 7d. for those of the great tower and granary tower. The sum of 2*l.* 2s. 10d. was allowed for the repairs of the wall of the inner ward in 1303; 2*l.* 12s. 11d. for the repairs of the stable; 18s. 0d. for those of the great tower; 1*l.* 6s. 5½d. for those of the gate of the outer ward."

"In 1304, also, the sum of 12s. was allowed for the carriage of 200 round stones, fit for engines; from the store at this castle to Winchelsea."

Several large green sandstone catapult balls, 9 in. to 15 in. diameter, were found at the bottom of the well; some are in the garden of the cottage on the east side.

The chapel foundations, which were uncovered in 1852, were covered in again; it would have been much better had they been covered with slabs of stone, and been left exposed; there would not then have been such a discrepancy between the position of them as shown by the Ordnance plan and Mr. Figg's plan, which shows the chancel facing the east, and is more likely to be correct. Neither would any one have fallen into the error of making the nave 8 ft. or 9 ft. broad by 40 ft. long,—rather a queer proportion. The dimensions, as given by Mr. Lower, are,—nave 40 ft. by 16 ft. 8 in. wide; chancel, 12 ft. 8 in. by 11 ft. 6 in. wide; the general thickness of the foundations of the walls, 2 ft. 5 in. There were indications of an aisle having existed on the north side. The flooring, which had been removed, appears to have been laid upon a bed of shingle; a stone step to the chancel remained. The chancel was divided longitudinally into three, and below the floor were discovered several skeletons. Right and left of the chancel step stone enclosures existed, perhaps for the pulpit and desk.

The piscina, which is about the only thing to guide one as to the date of the chapel, is in the form of a capital; from the carving it may be very late Transitional or Early English, and of nearly the same date as the castle. It could scarcely have been a holy-water stoup, as it has a hole through it, and it was found at the east end of the nave, probably near its original position. When the chapel was burned, the slates of the roof falling on the font and piscina probably prevented their entire destruction.

In a small sketch-plan that I made of the north-west tower, there are shown seven bays round the lowest story, and seven vaulting ribs; I fail to see how there can be eight vaulting-ribs, unless two spring from one of the angles.

The oblong mural chambers, east of north-west tower and west of north tower, appear to have been for hourds to protect the base of the wall.

It is a pity that, when the excavations were carried out, there was not an effort made to discover the foundations of buildings in the inner ward, as we should then have known the correct position and size of the hall, &c. It appears that the only thing that led to the discovery of the chapel was the dried appearance of the grass. William G. B. Lewis.

VENTILATION OF THE COUNCIL-CHAMBER, GUILDHALL.

The present Council Chamber at Guildhall will, in all probability, in a few years hence be superseded by a more commodious and architecturally-effective chamber than that in which the Common Councilmen of the City of London now hold their courts. Plans for a new chamber have already been prepared by the City Architect, Mr. Horace Jones, and the works connected with the substructure are in hand. Pending the erection of the new chamber, however, the City authorities have wisely sought to properly ventilate the old chamber, but, it would appear, they have sought in vain until recently, when they requested Messrs. Robert Boyle & Son, ventilating engineers, of London and Glasgow, to submit a scheme for the efficient ventilation of the chamber, which was accepted only on condition, as we understand, that unless the work when completed was approved of, — that is, unless it was completely successful, — it would not be paid for. Messrs. Boyle, confident in their power to succeed, set to work, with the result, as it would seem, of fully justifying their anticipations, and, what is more, of so fully satisfying the Corporation authorities that, after experiments and observations made since the completion of the work in January last, Messrs. Boyle have, on the certificate of the City Architect, been paid for their work.

We have had an opportunity of being present in the chamber during a meeting of the Common Council, and being aware, from personal experience, of the bad state of the atmosphere which used to prevail on court days, we are in a position to say that a marked improvement has been effected,—so decided a change for the better, in fact, that we can quite endorse the favourable opinion of it which has been given by Sir John Monckton, the town clerk, in a letter to Mr. Whichcord.

The application of the system may be briefly described as follows:—For the extraction of the vitiated air nine of Messrs. Boyle's patent self-acting air-pump ventilators are fixed on the top of iron shafts standing at various heights above the roof to clear the ventilators of obstructions. Four of these shafts, two at each end of the chamber, are 13 in. in diameter, branching off a little above the ceiling into two 10-in. pipes communicating with openings in the ceilings 2 ft. in diameter, connected by means of ornamental centre flowers. On the top of each of

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these shafts is fixed a 2-ft. air-pump ventilator. At the east end of the chamber a shaft, 18 in. in diameter, penetrates through the roof, having a 30-in. ventilator on the top, and expanding at the bottom to 2 ft. 6 in. by 2 ft. 3 in., covering an opening of the same dimensions in the centre of the ceiling. At the west end of the chamber a large shaft, 2 ft. 6½ in. by 1 ft. 8½ in., is carried a considerable height to the top of an adjoining building, surmounted by a 3-ft. ventilator, and terminating over an opening in the ceiling. A shaft, 16 in. in diameter, connected with the large chandelier suspended from the lantern over the central dome of the chamber, is also run into this shaft, the ventilation of the body of the chamber being partially effected by this means. On the top of the outer casing of the lantern three 13-in. shafts are fixed at equal distances from each other, capped with 20-in. ventilators; these shafts communicate with openings in the under portions of the lantern by means of expanded iron hoppers, and complete the arrangements for the extraction of the vitiated air from the centre of the chamber. A portion of these shafts formed part of the old system of ventilation, and were previously ornamented with revolving cowls. For the supply of fresh air Messrs. Boyle, with certain alterations, have utilised the arrangements which existed, making them thoroughly efficient. On the south side of the chamber four vertical air-tubes or brackets are fixed against the wall, two 2 ft. by 2½ in. by 3 ft., the other two placed a little higher up in the wall, being 1 ft. 6 in. by 4 in. by 2 ft. These tubes communicate with holes cut through the walls, 2 ft. by 8 in., finished with cast-iron gratings. These air inlets are all fitted with Messrs. Boyle's patent heaters,—which are now so well known as to need no further description here,—for warming the supply of air to any temperature required as it passes into the building; the north wall is similarly treated to the south, with the exception of having an extra tube at the end where the Lord Mayor sits. At the public end of the chamber three inlet-tubes are fixed, one at each side and one in the centre, also fitted with the air-warming arrangement. An abundant supply of air is admitted through these tubes, and tests have shown that the air can be warmed in cold weather to a temperature of from 60 degrees to 120 degrees, thus preventing cold draughts. With respect to the extraction of the vitiated air, experiments have shown that the average extraction of air from the chamber was 500,000 cubic feet per hour, and that during the whole of the experiments no down-draughts were experienced.

STAFFORD WATER SUPPLY.

SIR,—Having been responsible for the report on the proposed water-supply from Cannock Chase, which has recently been under the consideration of the Stafford Town Council, I venture to offer a few remarks suggested by the letter of "Sanitary Engineer" (*Builder*, November 11th).

I think the fact of obtaining fresh analyses of the shallow well water, with which the town is now supplied, must be only regarded as an expedient deemed necessary by some to again show unbelievers the urgent necessity of a pure town's supply. Though the Cannock Chase scheme has again been shelved, I do not think the public spirit of the Corporation can yet be fairly impugned when I enumerate the following facts:—

1. All the water-mains have been purchased and a great many laid.

2. Three borings in the New Red Sandstone have been executed under the supervision of a London engineer, but without success.

3. A fourth boring has been executed on a site suggested by an eminent local engineer, but without success.

It may seem like "putting the cart before the horse" to lay mains before the water-supply is obtained, but at the time they were purchased the price of iron was extremely low, and the first bore-hole was progressing so favourably that geologists and others declared the water-bearing stratum was about to be tapped.

I may add, with regard to the Cannock Chase scheme, that seldom has a corporation in late years been placed in the favourable position of Stafford in obtaining a water-supply with the payment of so little for compensations. The water has been pronounced by the county analyst as "simply splendid," and like "a very good and soft spring water or a perfectly filtered brook water." It would flow into the town by gravitation, and no expensive engineering works would be necessary in collecting.

Sir F. Bramwell, Professor Green, and Mr. W. Dennis, M. Inst. C.E., who have been consulted by the Corporation, have strongly favoured this scheme, and it is to be regretted that in a district where suitable collecting-areas are being rapidly snatched up by the larger towns and water companies, the county town of Stafford should have again let an opportunity slip of providing a pure water-supply from so economical a source.

J. BRADDON MCCALLUM.

THE GREAT FIRE IN SYDNEY, AND THE COLONIAL COLLECTION OF PICTURES.

SIR,—There has been considerable anxiety about the Colonial Collection of Pictures, for which the New South Wales Government have at various times liberally voted moneys. I must confess that, at first, I shared in this anxiety, and more especially with respect to Madox Brown's great picture of Chaucer. I have since, however, been inclined to think that it was a collection of some 350 pictures got together for a temporary exhibition, that was consumed in the burning of the Garden Palace, and not the Colonial Collection. In this supposition I am supported by a letter just received from the office of the Agent-General for New South Wales by desire of Sir Saul Samuel, K.C.M.G.

W. CAVE THOMAS.

NEW RAILWAYS.

Bala and Festiniog.—The new line of railway constructed by the Great Western Company, from Bala to Festiniog, was opened for passenger traffic on the 1st inst. Leaving Bala, for the first twelve miles the railway follows the river Tryweryn, the scenery along the whole distance being wild and romantic. The first station is near Frongoch Farm, and will be called Frongoch, about three miles and a half from Bala; the next is Rhydyfen, eight miles and a half, near the half-way inn of that name between Bala and Festiniog. At the foot of the Arenig mountain, within a mile of Llyn Arenig, the lake whence Bala derives its water supply, and Llyn Tryweryn or Migneint mountain, the line skirts the latter, and, being the highest point of the railway, there is here a relief siding for the traffic. Soon after leaving Llyn Tryweryn, twelve miles from Bala, the viaduct over the Lladron Brook is reached. This is a notable piece of engineering work, having nine arches of 36 ft. span and 104 ft. in height, and is the introduction along a high and steep elevation to the beautiful Vale of Cwm Prysor, passing Castell Prysor, the remains of a Roman fort, and approaching within three quarters of a mile to Trawsfynydd village, seventeen miles, where it makes a detour to the right. It passes the junction of the Festiniog and Meantwrog roads, where Meantwrog-road Station (twenty miles) is situate, with charming views of the surrounding hills over the Cynfael, not far from Hugh Llwyd's Pulpit and to the terminus of the Blaenau and Festiniog line, which has been purchased by the Great Western Company, and widened to the ordinary gauge. Rhydyfen station is at the foot of the Arenig, within a mile of Llyn Arenig. Mr. Dean was the contractor for the new line, which, in addition to opening up an attractive and hitherto little frequented route for tourists and visitors to this part of the Principality, will, it is expected, prove an important factor in the extension of the slate trade of the Festiniog district.

Shenfield to Southend.—The proposed *route* of the projected railway from Arnold's Wood, Shenfield, on the Great Eastern line of railway, *viâ* Billericay, Wickford, Rayleigh, and Rochford, to Southend-on-Sea, has been surveyed by Mr. Vincent Yardley and Mr. Chas. S. Morgan, from the office of Messrs. E. Wilson & Co., of Dean's-yard, Westminster, engineers to the Great Eastern Railway Company.

St. John's, Horselydown, the interior of which has been restored by Mr. Thomas Gregory, Station Works, Clapham Junction, under the direction of Mr. Blomfield, was opened on Friday, the 9th inst. New seats and stalls have been provided, the windows have been reglazed with cathedral glass, and the floors relaid with pitch-pine wood blocks.

CHURCH-BUILDING NEWS.

Somersham.—The Church of St. Mary, Somersham, near Ipswich, has just been restored. The church was probably built about 1350, in the reign of Edward III., but some of the existing windows, doorways, &c., are later. The building consists of a nave and chancel, with arch into the tower at the west end. The old gallery, which extended across this simply-moulded but well-proportioned archway, completely spoiling its proportion and greatly marring its effect, has been removed. A few of the large roof-timbers are still to be seen, and are of solid oak, some being moulded,—viz., the tie-beams and cornices, and these are probably of the date of about 1500 or 1600. These timbers had been coloured, but the colour has been carefully cleaned off and the work oiled. The old square high pews in the nave have been entirely cleared away and replaced by open pitch-pine benches of Early English detail. There is no chancel arch, but the floor of the chancel has been raised 4 in. above that of the centre aisle of the nave, with a wide Portland stone step extending across the church. The old choir steps were of oak, but of poor and unworthy design, and these have been replaced by oak stalls of Early English character. The whole of the carving of the choir-stalls has been carried out from full-sized drawings supplied by the architect. The old flooring in the chancel was of pamments. This has been replaced by Minton's tiles of black and red, with border, and some encaustic tiling has been placed inside the communion-rails. Extensive repairs have been executed to the exterior. The whole of the nave roof has been stripped and re-tiled, and the water-pipes and guttering re-adjusted, with proper drains from the pipes. The whole of the work has been carried out from the designs of Mr. E. F. Bisshopp, architect, Ipswich, and under his superintendence. The contractors are Messrs. J. B. & F. Bennett, of Ipswich. Messrs. Crisp & Smith did the painting and stencilling work, and Messrs. Groom & Son, of Ipswich, have executed the carving.

Oakford.—The parish church of St. Peter, at Oakford, Devon, has been re-opened, after being closed for some three months for the purpose of internal renovation. The building was all, except the tower, re-built so recently as 1838. In the ancient tower there are eight bells, and the church registers date from 1568. For some time it has been felt that the pews and other internal arrangements were hardly adapted for modern requirements, and so a clean sweep has been made of them, and Mr Edward Ashworth, architect, Exeter, was commissioned to prepare the necessary plans and superintend the renovation. The general contractor for the work was Mr. James Wood, of Lurley, near Tiverton, who has reseated the entire church with open benches of pitch-pine. The pulpit, prayer-desk, credence, &c., are of wainscot oak, and the work of Mr. Harry Hems. The pulpit, which is a memorial one, bears upon one of its panels, in unobtrusive characters, the following legend:—"This pulpit was given in memory of Frederick Temple and Walter Hillyard, by their brothers, George Anson, Arthur, and Henry, 1882."

Barnstaple.—The work of restoration at the parish church of St. Peter's, Barnstaple, is proceeding. The new reredos is to be of Beer stone. Mr. John Oldred Scott, M.A., the architect for the restoration, has produced a particularly ornate design for this reredos, and the work has been entrusted to Mr. Harry Hems, of Exeter. Mr. Hems has also been commissioned by Mr. Scott to prepare from his designs some altar-rails and a sedilia for the sanctuary. They will be of English oak, and are to be profusely carved.

Swansea Baths and Laundry.—In this competition (advertised in the *Builder*), the directors of the Swansea Baths and Laundry Company have received fourteen sets of designs for the erection of Turkish and swimming-baths and steam laundry. The directors met on Thursday to inspect the plans, but we are not aware whether they have yet come to any decision. A premium of 25*l.* was offered for the design which should be chosen, and the design so honoured was to "thenceforth become the absolute property of the company," who were to be "at liberty to deal with it in any way they might think proper." No other premiums were offered.

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STAINED GLASS.

Bicester.—A three-light window has just been erected in Bicester Parish Church to the memory of the late Rev. G. Bayldon Rogerson, M.A., formerly Tyrwhitt Hebrew Scholar and Seventeenth Wrangler, St. John's College, Cambridge. The artists are Messrs. Mayer & Co., who have already executed three other windows for the same church.

Islington.—The large west window of St. James's Church, Prebend-square, has recently been filled with painted glass, at the cost of Mr. T. W. Wing, a member of the court of assistants of the Clothworkers' Company, the trustees and patrons of the church, which is the foundation of William Lamb, citizen and clothworker. The upper part of it, which is a wheel window, in eight compartments, represents the six days' work of creation; in the five lower compartments are the figures of the following prophets, viz., Noah, Moses, Daniel, David, and Abraham, and under each figure is the illustration of an incident connected with his life. The accessory surroundings consist of canopy work, with angels bearing musical instruments, &c., in the shaftings. The whole is Venetian in tone of colour. The arms of the founder of the church and of the Clothworkers' Company are introduced, as are also, on a brass plate, those of the donor, with a suitable record of the gift. The work was designed and executed by Messrs. Lavers, Westlake, & Co., of Endell-street.

SCHOOL-BUILDING NEWS.

Ripon.—New Wesleyan schools here have been opened. The total cost of the new buildings has been about 1,000*l*. The contractors for the carrying out of the work were Messrs. Mitchell & Webster, builders, Ripon; Mr. Simpson, joiners' work; Mr. Baynes, slaters' work; Mr. Dalton, plumbers' work; and Messrs. Appleton & Son, stonework.

Dalston.—On the 14th ult. the late Lord Mayor (Sir J. Whittaker Ellis) laid the foundation-stone of new school and mission buildings for the parish of Holy Trinity, Dalston. The building, which, inclusive of fittings, will cost about 2,500*l*., and will afford accommodation for 150 girls and 160 infants, has been designed by Mr. G. H. Jones, the builders being Messrs. J. Jarvis & Sons, Hackney-road. It will be in the Gothic style, brick-built, with stone dressings.

Miscellanea.

Convict Labour and Harbours of Refuge.—The committee appointed by the Home Secretary on the employment of convict labour, which was presided over by Sir Edmund Du Cane, has concluded its report, which states that there are in Great Britain about 10,000 able-bodied convicts, of whom only about 1,000 are available for public works, but a largely increased number will shortly become available. The committee enter at some length into the question of harbours of refuge, and suggest that convict labour might be utilised in the construction of such harbours at Dover, Filey, and Peterhead. The commission of 1859, over which Sir James Hope presided, recommended Peterhead Bay as a suitable place for a harbour of refuge, further suggesting that 300,000*l*. should be spent upon the work, 100,000*l*. of that amount to be subscribed in the locality; but this latter condition was at that time found to be impracticable, unless a second harbour should be provided on the east coast of Scotland. The proposal to select Peterhead will be met by representations of the claims of Stonehaven Bay, in favour of which Robert Stephenson, the eminent engineer, and an official committee, reported in 1812, and again in 1830, as a suitable mooring-ground for the North Sea fleet. The present convict committee, who have been conducting their investigations for several months, state that the labour of nearly 700 convicts would be at once available for the construction of a harbour of refuge on the Scotch coast.

Carlisle.—A new mission-hall, erected in connexion with the parish of St. Paul, on a site generously given by the Duke of Devonshire, was opened on Sunday evening by the Lord Bishop of the Diocese. Mr. George D. Oliver was the architect of the building.

Liverpool Science and Art Classes.—The prizes and certificates gained by the students of the Liverpool Science and Art Classes were distributed by Professor Abel, F.R.S., on the 20th ult. The chairman (Mr. James Samuelson), in introducing the Professor, said that in the technological examination of May last, which, if not the first, was one of the earliest examinations in connexion with the trades' guilds, he found that the total number of passes in the United Kingdom was 1,162. In this list he was sorry to say Liverpool cut a very poor figure; Bolton obtained the largest number of passes, 124, against 112 secured by London, 109 by Glasgow, 71 by Manchester, 63 by Bradford, 35 by Huddersfield, 20 by Liverpool, 11 by Birmingham, 9 by Hull, 1 by Bristol, and 15 by Ireland. Of the twenty Liverpool students who passed the examinations nine were connected with the Science and Art classes. What he desired to draw attention to was the fact that this system of tuition gave a remarkable impetus to the industries of the United Kingdom. In Bolton, for example, nearly all the students had passed in cotton manufactures; in Glasgow, chiefly in pattern designing and mechanical engineering; in Bradford, in weaving and pattern designing; in Huddersfield, nearly all in cloth; and in Ireland, in linen. Professor Abel said the system of instruction, of special inspection and testing, and acknowledgment and reward of success, which had been pursued throughout the country under the direction of the Government Department of Education, was certainly one of the greatest among the many benefits which they owed to the successful realisation of that grand conception of the wise and far-seeing Prince whose memory was so deservedly revered,—the conception of gathering together all nations under one roof, as represented by their several achievements in arts, manufactures, domestic economy, and applied science in its many ramifications.

Lerwick Town-hall.—The new town-hall at Lerwick, in Shetland, exhibits much gorgeousness in its enrichments. The building is rapidly approaching completion. It will be peculiarly rich in painted glass and stone carving. The cities of Hamburg and Amsterdam, mindful of their long commercial association with Shetland, have each given a painted window, adorned with their arms and bearing appropriate inscriptions. The heraldic lions of Norway,—it will be remembered that Shetland was an ancient Norse possession,—and of Scotland are plentifully distributed; while in the great hall there will be a series of four windows of two lights each, constituting a complete historical sequence of the various princes, earls, and other noble personages formerly connected with the island.

South Stockton.—At a meeting of the South Stockton Local Board, on the 7th inst., it appeared from the minutes of the Finance Committee that the District Surveyor (Mr. S. E. Thorrold) had applied for an increase of salary in consideration of the important work of paving and sewering which he is about to carry out under the instructions of the Board. Having fully discussed the question, the committee recommended the Board to increase Mr. Thorrold's salary from 200*l*. to 300*l*. per annum from the 1st of January next, the Surveyor undertaking to continue in the employ of the Board for at least four years. The Board adopted the recommendation of the committee.

The Discoveries at Poitiers.—Further particulars have been received regarding the important archæological discoveries at Poitiers. They consist of a temple, 114 mètres long, and whose façade measures 70 mètres; a thermal establishment covering two hectares, with the piscina, canals, paving, &c.; a theatre, with a stage of the depth of 90 mètres; and, finally, several entire streets of houses. The whole occupies an area of about seven hectares,—about seventeen acres. Some of the buildings contain beautiful sculptures, attributed to the second century, and numerous objects of iron, bronze, and earth.

TENDERS

For new building for the Bury and West Suffolk Club, Bury St. Edmunds:—

Robinson, Bury	£2,889 0 0
Grimwood & Sons, Sudbury	2,695 0 0
Saunders, Maldon	2,640 0 0

The work was offered to Messrs. Grimwood & Sons, but refused by them, the form of contract and conditions not being in accordance with those agreed upon by the Royal Institute of British Architects and the Central Association of Master Builders.

For Chatham-place Schools, Hackney, for the School Board for London. Mr. E. R. Robson, architect:—

Wood	£16,840 0 0
Higgs & Hill	15,890 0 0
Perry & Co.	14,773 0 0
Atherton & Latta	14,700 0 0
Sargeant	14,484 0 0
J. Grover	14,466 0 0
Scrivener & Co.	14,460 0 0
J. Jerrard	14,389 0 0
Stimpson & Co.	14,270 0 0
W. Shurmur	13,977 0 0
T. Boyce	13,900 0 0
C. Wall	13,780 0 0
C. Cox	13,622 0 0

For schools at Basnett-grove, Lambeth, for the School Board for London. Mr. E. R. Robson, architect:—

Chappell	£11,918 0 0
Shepherd	11,780 0 0
Marsland	11,765 0 0
Atherton & Latta	11,708 0 0
Hart	11,563 0 0
Outhwaite & Son	11,539 0 0
J. Oliver	11,448 0 0
Higgs & Hill	11,390 0 0
Lawrance	11,372 0 0
Nightingale	11,178 0 0
Stimpson	11,150 0 0
Cox	10,580 0 0

For new offices, Fenchurch Buildings, City. Messrs. Davis & Emanuel, architects, 2, Finsbury-circus. Quantities by Mr. H. P. Foster, 5, John-street, Adelphi:—

Scrivener & Co.	£10,562 0 0
Ashby & Horner	10,485 0 0
Colls & Sons	10,290 0 0
W. Brass	10,120 0 0
G. S. S. Williams & Son	9,943 0 0
E. Lawrance	9,932 0 0
H. & W. Carter	9,750 0 0
J. Grover	9,684 0 0
W. Bangs & Co.	9,683 0 0
E. Conder	9,628 0 0
J. Mowlem & Co. (accepted)	9,347 0 0

For house at Woodford. Quantities supplied:—

Hampton	£4,878 0 0
Egan	4,715 0 0
Wells	4,675 0 0
Hoskins	4,627 0 0
Robson	4,594 0 0
E. Good	4,543 0 0
W. Shurmur	4,248 0 0
Wontner Smith & Son	3,989 0 0

For ten cottages at Walthamstow. Messrs. Ward & Shiner, architects:—

Ansell	£2,345 0 0
Marsland	2,295 0 0
Hearle & Son	2,295 0 0
W. Shurmur	1,980 0 0
Good Bros.	1,900 0 0
Hughes	1,883 0 0

For new Congregational Church, Seven Sisters-road, Finsbury Park. Mr. Charles Henry Searle, architect, No. 12, Southwark-street. Quantities by the architect:—

Patman & Fotheringham	£10,650 0 0
Manley	10,259 0 0
Brass	9,830 0 0
Nightingale	9,679 0 0
Macey & Sons	9,612 0 0
Dove Bros.	9,565 0 0
Bywaters	9,494 0 0
Williams & Son	9,482 0 0
L. H. & R. Roberts	9,410 0 0
Harris & Wardrop	9,094 0 0
Woodward	8,931 0 0

For putting shop fronts and other works to five shops, Lavender-hill, Wandsworth. Mr. F. Boreham, architect:—

Atkinson	£2,203 0 0
Sawyer	2,100 0 0
Hogben	1,980 0 0
Holloway Bros.	1,642 0 0
J. Holloway (accepted)	1,475 0 0
Kerry (withdrawn)	1,407 7 6

For new shop front and other works, Victoria Dock-road. Mr. F. Boreham, architect:—

Gregar	£665 0 0
Sawyer	542 0 0
Morter	527 0 0
Shurmur	532 0 0
Johnson	489 0 0
Roberts Bros. (accepted)	442 0 0

For plumbing and sanitary work at new hall and offices for the Operative Bricklayers' Society, Southwark Bridge-road. Messrs. A. & C. Harston, architects:—

J. Knight, Westminster (accepted)	£221 0 0

For the erection of an amphitheatre and buildings in connexion therewith, in High-street, Ramsgate, for Mr. George Sanger. Mr. Albert Latham, C.E., architect, Margate:—

First Section.

	Ancaster Stone.	Bath Stone.
Bushell, Margate	£6,645 0 0	£6,605 0 0
Fish & Co., London	6,388 0 0	—
Hutchinson, London	6,300 0 0	6,150 0 0
Adcock, Dover	5,756 0 0	5,636 0 0
Shrubsole, Faversham	5,689 0 0	—
Home, Ramsgate	5,680 0 0	5,450 0 0
Frostick, Westgate	5,630 0 0	5,590 0 0
Paramor & Son, Margate	5,590 0 0	5,532 0 0
Martin, Ramsgate	5,496 0 0	5,316 0 0
Smith & Son, Ramsgate	5,440 0 0	5,210 0 0
Denne Bros., Deal*	4,943 0 0	4,900 0 0

* Accepted.

For Curtiss Hotel, Felixstowe:—

Thwaites	£3,890 0 0
Kemrey	3,750 0 0
Coe	3,425 0 0
H. B. Smith	3,400 0 0
Saunders & Son	3,333 0 0
G. Grimwood & Sons	3,248 0 0
R. S. Smith	3,097 17 0

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For building house and business premises at Heavitree, near Exeter, for Mr. M. Sewell. Mr. Charles Pinn, architect. Quantities supplied:—

Moass & Sons	£754	0	0
Gibbard	706	0	0
Kenshole	675	2	0
Stile	637	0	0
Stephens & Son	593	0	0
Pratt	563	15	0
Holmes (accepted)	553	0	0

For Primitive Methodist Chapel, Old Lenton, Notts. Mr. John Wills, architect:—

Wheatley & Maule	£2,048	0	0
Geo. Hewitt	1,730	0	0
Marshall Bros.	1,618	0	0
R. Dennis	1,600	0	0
H. & W. Butler	1,582	0	0
Munks	1,575	0	0
Attwell & Savage (accepted)	1,550	0	0

For erecting two shops, surgery, and houses in High-street, Southend-on-Sea. Messrs. Ough & Natusch, architects, London and Southend. Quantities supplied:—

Wm. Wood	£2,267	0	0
J. Grover	2,136	0	0
F. E. Woodhams	2,043	0	0
Baker & Wiseman	1,967	7	5
J. W. Steward, Southend	1,927	15	8

For kerbing, paving, and reconstructing Grange-road and Eaton-rise, Ealing, Middlesex, for the Ealing Local Board. Mr. Charles Jones, C.E., surveyor:—

Gibson	£2,833	0	0
Seward	2,363	0	0
Adamson	2,273	0	0
Strachan	2,215	0	0
Nowell & Robson	2,124	0	0
Pizzey	2,090	0	0
Watkins	2,006	0	0
Finnegan (accepted)	1,842	0	0
Baxter (withdrawn)	1,627	0	0

For rebuilding Freeman's Arms Hotel, Aylestone-road, Leicester. Mr. J. Bird, architect:—

Hutchinson & Son	£1,729	10	0
N. Elliott	1,716	0	0
T. & H. Herbert	1,698	10	0
Sharp & Son	1,679	0	0
Geo. Hewett	1,675	0	0
Clark & Garrud	1,669	0	0
T. Duxberry & Son	1,579	0	0
J. Jewsbury	1,493	0	0
C. Bass (accepted)	1,490	0	0
H. M. Hewitt	1,489	0	0
T. Johnson	1,439	0	0
Chas. Wright	1,400	0	0
O. Wright	1,336	0	0

For alterations and repairs at the Duke's Arms, Stangate-street, Lambeth, for Mr. Wright. Mr. W. E. Williams, architect. Quantities not supplied:—

Marr	£789	0	0
Langridge & Son	698	0	0
Staines & Sons (accepted)	676	0	0

For the erection of a mission-hall, with class-room, club-room, and offices, Hammersmith. Mr. Hugh Roumieu Gough, architect, 6, Queen Anne's-gate:—

J. Norris	£2,920	0	0
Adamson & Sons	2,770	0	0
Adams & Son	2,706	0	0
Chamberlain Bros.	2,699	0	0
Belham & Co.	2,550	0	0
G. Sharpe	2,492	0	0
J. Lister	2,435	0	0

For laundry fittings and kitchen apparatus at the Joint Counties Lunatic Asylum, Abergavenny. Messrs. John Giles & Gough, architects. Quantities by Mr. C. H. Goode:—

Adams & Son	£2,985	0	0
Berry & Sons	2,871	0	0
Bradford & Co.	2,689	10	0
J. & F. May (accepted)	2,650	10	0
Two Boilers and Fittings.			
J. & F. May (accepted)	£870	0	0

For building a lodge at Hampstead, for Mr. A. Davis:—

Jones & Branch (accepted).

For alterations to the Yorkshire Grey Public-house, Whitechapel, exclusive of pewterers' work. Messrs. Wilson, Son, & Aldwinckle, architects, 2, East India-avenue, Leadenhall-street. Quantities supplied:—

Shurmur (accepted)	£1,782	0	0

For recovering flats over aisles of St. Leonard's Church, Colchester, with 7 lb. lead. Messrs. Ebbetts & Cobb, architects, Savoy House, 115, Strand:—

Rogers	£290	0	0
J. G. Johnson	275	0	0
Mills & Son	249	0	0
J. H. Johnson (accepted)	230	0	0

For the erection of factory, &c., in Lower Ford-street, Coventry, for Mr. G. Townend. Mr. Herbert W. Chattaway, architect, Trinity Churchyard, Coventry:—

H. Gardner, Coventry	£820	0	0
C. Haywood, jun., Coventry	755	0	0
J. Worwood, Coventry	748	0	0
J. Brown, Coventry	745	0	0
R. Wootton, Coventry	695	0	0
T. Mayo, Coventry	628	0	0
C. Garlick, Coventry (accepted)	590	0	0

For new front to No. 12, Marlborough-place, Brighton. Mr. Arthur Loader, architect, Brighton:—

J. Barnes	£207	0	0
G. T. Garrett	205	0	0
H. Parsons, Brighton (accepted)	202	10	0

For the erection of school-room, offices, &c., at Offley-road, Brixton, for Mr. George Morrish. Mr. Edward C. Pressland, architect:—

Windsor	£709	6	0
Harding	705	0	0
G. & S. Fisher	659	0	0

Messrs. Oldes Bros., shop and office fitters and house decorators, of 20, Finsbury-pavement, and 35, Wilson-street, Finsbury-square, are to execute the shop alterations and fittings for Mr. George Cashford, of 332 and 272, Mare-street, Hackney.

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The Builder.

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Dr. Dresser's "Japan."

THE author of this interesting and instructive book* apologises for having added another to the considerable list of books about Japan, on the ground that he is a "specialist," and being an ornamentist by profession, went to Japan to observe what an ordinary visitor would pass unnoticed. His book needed no apology, and though he is not the only specialist who has produced a book on Japanese ornament, he takes a wider and more critical view of the subject than any other such book we have seen gives us; he took special means to procure a number of reliable illustrations, engaging the best native photographer he could find to take views and architectural details of buildings, and the best ornamentist in Kioto to make coloured drawings of temple decorations; and, which gives the particular value to his book, he has bestowed a degree of attention to Japanese architecture which we have not met with in the works of previous writers, who have usually been entirely taken up with the ornamental details and animal paintings of Japanese art.

Like other visitors to Japan, Dr. Dresser appears to have been a little carried away by the novelty and ingenuity of the art among which he found himself, and to have attributed under this influence a rather greater degree of importance and interest to Japanese architecture than the illustrations he gives would bear out, or than we should be at all disposed to accept as probable. Dr. Dresser tells us that in reality the public here at present know nothing, and even architects very little, of Japanese architecture; and that coloured illustrations, which he was unable to furnish, would have been necessary to enable his readers to realise at all the beauty of detail which fascinated him so much. Both these statements we can readily accept, but we must take with reserve the statement that Japan "has had a great architectural history." We can hardly see how such an expression can be used in regard to a people whose architecture is almost entirely a wooden one, of a charmingly piquant, ingenious, and picturesque, but also a very flimsy and perishable type. That the history of many of the leading forms used in Japanese architecture must go a long way back is true enough, but if the country had ever had anything that could be called a great architecture there would be the remains of it. There is this peculiar kind of historic interest about it, however, which we do not see that our author quite appreciates, namely, that it seems almost like the traditional preservation in their original wooden form of many of the characteristic details of the stone architecture of India, which were obviously imitations of wooden forms in stone. The Japanese would seem to have had in their architecture the same kind of perpetual conservatism which has characterised China in almost everything; so that we have now before us, in these elaborate wooden bracketed buildings, of which Dr. Dresser has procured some good illustrations, the type of wooden building from which the Indian stone buildings originally were derived, still preserved by Japanese tradition. Either this is the case, or, on the other hand, it may be that the Japanese re-translated into wood the Indian stone architecture; in which case Japanese architecture must be regarded as a kind of painted flyleaf blown from the vast volume of Indian architecture. That the two are closely connected no one can doubt, as far at least as regards many of their details.

As to the general character of Japanese structures, dwellings especially, which is really rather that of roofs supported on props than of "buildings" in the true meaning of the word, Dr. Dresser finds the origin of this in the style of erection still represented in the temple erected by the people called Ainos in the northern island, Yesso. This very rude form of temple, of which he gives a sketch, consists of a heavy and clumsy-looking thatched roof supported on three rows of poles, at the two ends and across the middle, representing, in fact, the very rudest idea of columnar architecture. If the same general design were decorated with the rich details usually found on Japanese temples, and the spaces between the columns filled in with wooden panels, the general idea of a Japanese temple would be realised. The explanation is a not improbable one, and is only a repetition of the process seen in other styles, of the growth of an elaborate architecture from a primitive simple structure, the main forms and arrangement of which are retained. In his expressions in regard to the architectural merit of even the finest of these buildings as they stand, our author is, we think, somewhat carried away by the influence of Japanese air and Japanese surroundings. It may be possible that the same effect would be produced on others, and that an architect who went out to Japan in the spirit of Balaam, to curse the architecture of the people, would bless it altogether. To speak seriously, we quite understand the fact on which Dr. Dresser so much insists, that the brilliant and effective colouring is a great part of the value of Japanese temple architecture, and that this cannot be well realised to the mind's eye by any verbal description. But no colouring can alter the fact that the Japanese architecture, the very examples which are shown in Dr. Dresser's illustrations as the finest specimens, partake largely of what is an essentially barbaric element, viz., the attempt to produce effect by profusion of detail rather than by thoughtful design directed to the true expression of the construction. In one or two more considerate moments the author himself admits this, and observes, for instance, that in some cases the system of bracketing "is carried to an extent which seems altogether extravagant." It certainly is; and this is not a characteristic of really intellectual or well-considered architecture; and when the author gets into his enthusiastic mood again, and says that "no one can look upon either the temples of Shiba or of Nikkô without feeling that the architect of these glorious buildings understood perfectly the principles both of construction and of beauty"; when he elsewhere comments upon the admirable sense of "proportion" in Japanese architecture; and when we compare these laudations with the view of one of the principal gateways of the temple enclosure at Nikkô, we feel that the author's enthusiastic spirit has entirely run away with his critical spirit. The elaboration of the thing is astonishing, and may well look much more so when covered with colour; but, to talk of "proportion" or of "principle" in reference to such a design as this, a mass of ponderous and unnecessary roofing and bracketing all huddled together in a heap on the top of a substructure which it seems entirely to crush, is really a misuse of words. The very quality which, more than any other, distinguished civilised from uncivilised architecture is the power of choice, of selection, of what we may call reticence, which is exemplified in such architecture as that of the Greeks and the earlier Mediæval builders. To give the same praise to design such as that from Nikkô, to which we have referred, is really to forget, in admiration at the barbaric profusion of the detail, the qualities which are needed to raise architecture to the rank of an intellectual art. The manner of using and applying ornament in Japanese architecture is as much at variance with the conditions of intellectually true architectural expression as is the thoughtless profusion of its application. What could be more absurd, more contrary to the whole meaning of ornament as applied to architecture, than to sculpture conventional water all over a wooden column? The author seems himself to have some difficulty in swallowing this water, and makes an attempt to defend it by observing that the Greeks used the wave-scroll "on various parts of their buildings."

* Japan: its Architecture, Art, and Art Manufactures. By Christopher Dresser, Ph.D., F.L.S., &c. London: Longmans, Green, & Co.

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Yes; but not on columns and architraves. A remark which is made about the use of diapers on beams and other horizontal members of architecture is so extraordinary as to lead us to doubt whether Dr. Dresser is not too much prejudiced (temporarily only, perhaps) in favour of Japanese art for us to accept his evidence as to facts without making considerable allowance for an apparently very strong bias. He says "we never enrich beams and joists by small, repeating, geometrical patterns, but the Japanese do." In this respect they are wrong, and European artists are right. That is not the proper way to give expression to constructional lines or features. But Dr. Dresser adds, "in no case have I seen a diaper pattern so placed on a beam that it was broken by the angle, or so that one, two, or more repeats of the pattern did not exactly fit on each side of the timber figured." If we are to accept this as a statement of the characteristics of the Japanese method of applying ornament in such cases, all that can be said is that almost the whole of the Japanese work sent to England, including most of the specimens in the South Kensington Museum, must have been deliberately selected so as to take us all in, and convey to our minds a notion entirely at variance with the truth. One of the most marked characteristics of Japanese ornament as represented there and in other collections is the habit of applying ornament to objects without the slightest reference to their shape or bounding lines, insomuch that it is as common a thing as possible to find one half of a leaf on one face of a rail or a box, and the other half doubled over on to the other face: it is done, in fact, so constantly as to lead to the idea that the Japanese have a perverse wish to throw ornament on to an object as if it had only got there by accident, and had never been intended for its position.

There are some special points mentioned in regard to Japanese construction which are worth attention. One is, in reference to the means taken to secure pagodas against being overthrown by earthquake, which have not been described before, and which is very interesting, whether it be the regular way of constructing them or whether it is only a special case. We will quote the author's words:—

"When I first ascended a pagoda I was struck with the amount of timber employed in its construction; and I could not help feeling that the material here wasted was even absurdly excessive. But what offended my feelings was the presence of an enormous log of wood, in the centre of the structure, which ascended from its base to its apex. At the top this mass of timber was nearly 2 ft. in diameter, and lower down a log equally large was bolted to each side of the central mass. I was so surprised with this waste of timber that I called the attention of my good friend Sakata to the matter, and especially denounced the use of the centre block. To my astonishment, he told me that the structure must be strong to support the vast central mass. In my ignorance I replied that the centre part was not supported by the sides, but on reaching the top I found this monstrous central mass suspended, like a clapper of a bell; and when I had descended I could, by lying on the ground, see that there was an inch of space intervening between it and the earth which formed the floor of the pagoda."

The pagodas thus formed, with a hanging weight inside to keep their balance, have in some cases withstood the earthquakes of 700 years. The method is certainly very characteristic of that peculiar *cleverness*, rather than genius, which is the distinguishing quality of the Japanese.

The treatment of walls by the Japanese, in the comparatively rare instances in which these are built of stone, is characteristic. They are always built with a batter, as the only means of giving them anything like tolerable security against the effects of earthquakes; and in the case of a water-tank at Shiba, of which Dr. Dresser gives an illustration, the monolith granite columns which support the tank and its roof or shelter all lean inwards to a considerable extent. Certain walls have a character and meaning of their own; walls which surround land which is in the occupation of any one of royal blood are yellow in tone, with five horizontal white lines dividing them into bands, looking like the joints of a system of horizontal rustication. It is common to cover walls along their whole length with a roof to keep off wet and sun; and in a like careful practical spirit the ends of all timbers used in building construction are cased with metal. But in the ordinary dwelling there is hardly anything usually like what we call a wall. Rooms are divided from each other by a series of light, carefully-made panels, most of which can be slid backwards and forwards over each other at pleasure. One of the author's first experiences was that just after he and his party were in bed (which appears to have meant an endeavour to arrange themselves under, upon, or between a series of little mattresses) a young woman entered through a corner panel to get something from a cupboard in the room: you can never tell, he observes, when or where any one may enter a room in a Japanese house, the wall is all a series of doors and a person coming in enters at the most convenient point. This is quite in keeping with various other habitudes of a country where everything seems to be done in the contrary way from that practised by the rest of the world, where carpenters plane wood by drawing the plane towards them instead of pushing it from them; and similar eccentricities appear to meet the visitor at every turn.

Concerning the general excellence of workmanship which characterises Japanese production, and also the habit of elaborately decorating portions of objects which are not seen unless specially looked for, Dr. Dresser has one or two interesting suggestions to make. One cause of the ambition after perfect execution he thinks is to be found in the constant presence among the people of a being who is still, except to very advanced and rationalistic Japanese, almost in the place of a god; namely, the Mikado. Part of the mystery hanging over this hereditary deity, as he may be called, is now being dissipated, and Dr. Dresser was even admitted to an interview for the purpose of exchanging addresses with him. But the Mikado has long been regarded as the god incarnate of the Shinto Church, and a being too sacred for human eyes to rest upon; and in every house is a little raised daïs cut off from the rest of the room, on which the Mikado, if ever he came to the house, would sit. This is, in fact, an altar to a god who may visit the place in person at any time; and becomes a little centre for offerings of beautiful things, and for the exercise of art in decorating it; and the existence of such a centre in every house probably would not be without its effect on the artistic culture of the people. The liking for ornament in odd places, as on the bottom of a teapot or tray, Dr. Dresser ascribes to that pleasure in ingenious surprises which is a common quality in mankind, but which seems peculiarly developed in Japan. They seem to have a feeling that whatever is worn or used should, even though appearing simple and unpretending, be worthy of most minute examination. Thus, says the author "a walking-stick which Mr. Yeno, the late Japanese minister to England, kindly gave me, appears at first sight to be a mere rude hedge-stick; but upon close examination it is seen to have most exquisitely-cut metal insects creeping over it,—some being half buried in the bark, some crawling out of the little holes, and some running along the surface." This is very pretty and piquant, and no doubt this feeling of making everything worth minute examination is one of the most fertile inducements to the production of highly artistic work.

There is one feeling which the Japanese seem to have highly developed, and which we, in our popular taste, seem to be peculiarly and deplorably destitute of,—the importance attached to the work, the design rather than the material. In metal work, as our author observes, iron, zinc, bismuth, gold, silver, and copper, are all of indifferent value to them, being only so many different substances capable of being artistically treated each in its proper manner. We know how it is with us. Some interesting illustrations are given of the large ornamental nail-heads, some of them of beautiful design, which are inserted, it appears, solely as ornament, for the sake of the heads. Some of them might furnish suggestions (greatly needed) for the artistic treatment of rivets and bolts in engineering work.

One of the most interesting bits in Dr. Dresser's book is his account of an evening when he was asked to meet some of the leading artists of Japan, and see them execute sketches, which several of them did in succession in the presence of the visitors. We may quote the description of one of the sketches, and its method of execution. The subject was a flying duck:—

"A brush of considerable breadth was dipped in water and drawn between the fingers of the artist till nearly dry. It was then dipped in a thin wash of Indian ink, the central portion of the brush being bent outwards, so that the hairs of the brush assumed a crescent form. The convex or centre portion was now hastily dipped into dark Indian ink, and the brush was allowed to straighten itself. Two or three hairs were now separated from one side and dipped into dark ink, but these remained detached from the other part of the brush. By a dexterous movement the artist produced with one stroke the shaded body of the duck and an outline, the few separate hairs making the latter, while the shading resulted from the darker ink of the centre not having fully spread to the sides of the brush. A bill is now drawn, then feet, then tail feathers. An eye is added, then follows a neck, legs, and a few finishing touches, when an admirable sketch of a flying duck is before us."

After this another gentleman proceeded to draw what was supposed to be a sea-piece, but just as they were expecting him to add the fish in the waves, he finished with a few dots and dashes, and the drawing became a procession of white rats, the lines of whose heads and backs were formed by the limit where the wave-like shading stopped. This is another characteristic example of that curious inversion of the usual habits of mankind which seems to pervade Japanese life: artists of other nations draw an object and then add a background; the Japanese draw the background first and leave the outline. Remarkable as is the skill of manipulation described above, it is possible to make too much of this sort of work. It is a kind of art in which long practice may produce a dexterity which seems extraordinary, but which, after all, is rather a matter of a quick eye and sleight of hand than of artistic production in the intellectual sense; and the frequent repetition of the same animals in nearly the same attitudes in Japanese paintings tends to support this view. It is a curious example of the partial drawing powers of the Japanese, highly practised in one direction, limited in another, that Dr. Dresser mentions that, having engaged one of the best decorative artists of Japan to make drawings of the decorative details of the temples for him, a particular rather complicated bracket was sent to him in the form of a model instead of a sketch, the explanation being that the artist had not sufficient knowledge of perspective to make a sketch of it, so had made a model instead; so that a draughtsman who could probably have drawn a foreshortened figure of a crane or a duck readily enough, was "floored" by a complication of artificial lines and surfaces at right angles to each other. Dr. Dresser's remarks on the universal use of the brush, and not the pencil, for drawing in Japan, and the freedom of style resulting therefrom, are worth attention; but he must not undervalue the training in form which the use of the hard precise lines of pen or pencil is calculated to give.

Some of the lights thrown on the character and social feelings of the Japanese are interesting, and also throw out strange contrasts. Their kindness to animals, especially of the smaller and feebler sort, is a very pleasant trait. A Japanese child, we are assured, will play with a butterfly, but will not harm it, and the birds show no fear of a people who never hurt them. On the other hand, a Japanese dinner-party will cut slices from a living fish which looks at them from its dish as they eat it. The curious indifference of both sexes in Japan about bathing or going to the bath without any clothing, in the presence of any number of spectators, is alluded to by the author, as it is by most visitors; curious on the part of a people who are habitually very fully clothed, and who do not appear to strip themselves publicly on any other occasions. But we doubt the deduction the author draws as to the simple morals of the people. An English lady, who wrote a clever book on Japan a little while ago, with special reference to the social rather than the artistic side of the subject, recorded the opinion, if we recollect rightly, that the idea of morality, as we understand the word, had no existence in Japan. We take it, the habit is only one of the eccentricities and contradictions of Japanese life, and that no particular deduction can be drawn from it. Another and a very agreeable trait of Japanese society which the author mentions, and which is connected with the appreciation of art, is the respect in which, according to his observation, the genuine artist is held in Japan. Money alone, Dr. Dresser

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believes, brings a man no position in Japan. A prince will spend hours in conversation with a skilled workman, and will receive him respectfully at his residence, but the richest merchant will be beneath his notice. If this be true, Japan certainly, in one sense, is a very advanced country.

The author mentions that his book has had to be brought out during a serious illness, and chiefly by the assistance of his family. This may account for one or two oversights; the letter from the late Mr. Okubo, the Minister of the Interior in Japan, in regard to contributions representing English industries that were sent over through Dr. Dresser, is printed twice over in two different portions of the book. But the volume is full of interesting information, and the copious and excellent illustrations render it in another sense a very useful and ornamental addition to an artistic library.

SHAFTESBURY'S "CHARACTERISTICS" OF EPHESUS AND ARCHITECTURE.

In our recent observations on the late publication of "Ionian Antiquities" by the Society of Dilettanti, we purposely reserved any notice of one marked peculiarity of the templar architecture on the eastern coast of the Ægean; this is the affection, among the Ionian Greeks, for the elevation of the naos or cella and its peristyle upon a platform of numerous steps. The temple at Priene, it is true, conforms very strictly to the western usage; like the Parthenon and like the Erechtheum at Athens, it has only two steps below the proper stylobate. In this respect it departs from that agreement with the great Ephesian temple, which is so marked in the design of the bases and subbases. The general platform of the temple at Teos was ascended by five steps, and additional dignity was sought to be given to the eastern and principal front by ascent from a lower level by seven more. The peristyle of the Smintheum surmounts a uniform system of ten steps on all sides,—a solid basement which was maintained by a peculiarly firm foundation of clamped masonry. In both these cases the bases of the columns were set so far back as to allow the stylobate to tell with the effect of an additional step, and the spreading basement harmonised at Teos with the open spacing of the columns, and at the Smintheum still more expressively with the unusual breadth conceded to the ambulatory. The plinths of the Priene column are set all but flush with the edge of the step.

The feature of a broad and spreading basement, then, is as decided in these two temples of Ionia as in the temple of the great goddess Artemis at Ephesus, though there it appears on a vaster scale and more magnificently designed. Callimachus, in his Hymn to the Ephesian goddess, refers especially to a broad basement (*themethlon*), that was built around the statue, of which the original dedication was ascribed to the Amazons. It was by the suggestion of this passage, combined with the observation that the large all-round dimensions given by Pliny were inconsistent with a commensurate octastyle front, as avouched by Vitruvius, and with an interval for the columns which were among the first discoveries reported by Mr. Wood, that the conclusion was anticipated which the progress of excavation was destined to confirm, that the temple proper, with its immediate steps, was elevated upon a broad platform, giving a wide margin all round, and ascended by its own system of steps. The argument will be found at length in the *Builder* for February 10th and 17th, 1872, with the conjectural plan, which may be compared with that of Mr. Wood in the number for July 25th, 1874. These dates, we cannot but interpose, remind of the rapid flight of time; they remind,—they warn us also,—that the excavation is still incomplete, and that though the funds which are required for its effective prosecution are as likely to be obtainable hereafter as at present, the main conditions for such prosecution, apart from which any affluence of funds will be nugatory, are the zeal and energy and knowledge of an individual,—of the discoverer himself,—who happily is still in full force, but who can no more than the rest of us last for ever.

The recurrence of this topic of the "broad basement" of the Ephesian temple is an invitation to supplement some remarks on architectural metaphors of the Epistle to the Ephesians, which will be found in the article, "Revision (architecturally) Revised," in the *Builder* of 11th June, 1881. We were there only concerned with giving an accurate interpretation of "the chief corner stone" as a normal foundation stone, and to be distinguished from the "head stone of the angle,"—the acroterion of Matthew xxi. 42.

But the passage has a further interest from the point of view of architectural history. The observation of this is due to Anthony, Earl of Shaftesbury. The third Earl of Shaftesbury was one of those writers whose influence upon the world is astonishingly wide and deep, whether we consider how little they wrote, how absolutely what can be called the popularity of their writings, if ever popular they can be said to have been, has gone by; these are frequently writers, and Shaftesbury is no exception, whose style is occasionally careless, and, though seldom obscure, at times somewhat perplexingly desultory and disconnected; but there is ever originality at the basis, and this secures for them not only their primary influence but continued vitality and important reaction on the minds of important students. No slight matter this, though any such continued interest is missed too often by the historians of mind and morals, who, after bestowing upon them a chapter, a page, or a paragraph, think they have done enough, and unceremoniously write them off as exhausted and superseded once for all. The grandson of the first earl, who was at once the Architophel of Dryden and the friend of a high-minded and consistent patriot like John Locke,—the great-grandfather of the present earl, who is the object of such well-deserved and uniform regard and respect; Anthony, the third Earl of Shaftesbury, stands in scarcely less contrast to one than the other. The side of his character which interests us here,—it is not that which has had least justice done to it by biographers and historians,—is his interest in the fine arts and in the theory of beauty especially as allied to the faculty of appreciating moral character and ethical distinctions. It was in his pursuit of this theme that he originated the phrase of the Moral Sense, which Adam Smith only used cautiously as a neologism, but which now seems to be absolutely indispensable for the conduct of any discussion as to the expression of sentiment by any art whatever that pretends to go beyond the commonplace and the superficial.

We seem to be wandering somewhat wide of Ephesus, but divergence from the high road may easily become habitual with those who take the hand of Shaftesbury; the very passage which we are interested in is introduced by a repudiation of "ordinary exactness and regularity,"—by an assertion of "the greater privileges by way of variation, interruption and digression allowed to us writers of miscellany, and especially to such as are commentators upon other authors." But, not to ramble further, the immediate point in question is this:—Shaftesbury, in one of the interesting notes to his "Miscellaneous Recollections," in the small volumes of "Characteristics," which let us casually into the secret of the wide range of his learning and depth of study, adverts to the architectural images and metaphors in the Epistle to the Ephesians, as manifestly suggested by the familiarity of his correspondents with the great temple. "The magnificence and beauty of that temple," he says, "is well known to all who have formed any idea of the ancient Grecian arts and workmanship. It seems to me to be remarkable in our learned and elegant Apostle that though an enemy to this mechanical spirit of religion in the Ephesians, yet, according to his known character, he accommodates himself to their humour and the natural turn of their enthusiasm by writing to his converts in a kind of architect style, and almost with a perpetual allusion to building and to that majesty, order, and beauty of which their temple was a masterpiece."

The title of the Epistle to the Ephesians is, it may be said, universally assumed to be erroneous, as it purports to be addressed by Paul during his captivity to a congregation of exclusively Gentile converts, to whom he was unknown (i. 15 and iii. 2), a very unlikely case in a city where his activity had been prolonged and successful. At the same time there is strong presumption that it was addressed to converts in the Asian neighbourhood of Ephesus. This is a natural inference from the correspondence of its topics and phraseology, as pointed out in detail by Paley, with the Epistle to Colossæ, a town on an affluent of the adjacent river of Mæander. This epistle refers to one which had been despatched to another neighbouring city, Laodicea, to converts who were equally unacquainted with him personally, and the possibility has always been entertained that it is this which we possess under the Ephesian title.

But there is, at the same time, at least a possibility that there were more than one congregation of Christians at Ephesus; not only that which Paul had commenced and extended so far as to alarm the devotees of the great goddess, which included disciples whom he had separated from the synagogue and taught in the school of Tyrannus, but a distinct congregation of later origin. In the speech to the elders of Ephesus at Miletus he expresses an anticipation which we may safely take to represent the event, that "among themselves men would arise speaking perversely and drawing away the disciples after them." He says that "he had not shrunk from declaring to them the whole counsel of God," a phrase which always imports, as he employs it, an allusion to the broad principle of the entire supercession of the Jewish law both for Jew and Gentile equally. If this were so we need not wonder,—in fact, we must inevitably conclude,—that as the Christian movement went on at Ephesus the Judaisers became more and more exclusive, and the more liberal party more and more decided and explicit. We are in no way justified in supposing that in so large a city as Ephesus all the congregations, differing as,—we have St. Paul's word,—so many did among themselves, were already a uniformly organised church, with a single set of officers. Now this view of the true Ephesian reference of the epistle is strongly confirmed when we look closely to the terms of the passages which struck Lord Shaftesbury so forcibly. It is true that architectural metaphors occur in the other epistles, and particularly in the First to the Corinthians; but the fact that this was written from Ephesus is in itself confirmation of the source of the suggestion. The Ephesians are thus addressed in the passage which the note quotes in the Greek,—"So then ye are no longer foreigners and aliens, but fellow-citizens of the saints and of the household of God, being built up on the foundation [*themelion* = basement] of the apostles and prophets, Jesus Christ himself being the normal angle stone," &c. At chap. iii. 17, the value of the allusion is lost in the Revised Version, which gives or leaves, "To the end that ye, being rooted and *grounded* in love, may be strong to apprehend what is the breadth, and length, and height, and depth," &c. The word translated *grounded*, and thus inevitably conveying an impression of allusion to the same image as *rooted* that precedes it, is a derivative of *themelion*,—basement,—and might more properly be translated "founded."

This temple was the centre of multitudinous gatherings and religious celebrations for all the adjacent districts and provinces of Asia ever since, as for long before the time, when even the Persian satrap Tissaphernes, according to the last sentence that Thucydides penned, resorted thither to pay service to the great goddess; it is, therefore, not extraordinary if in the parallel epistle to the neighbouring Colossæ we meet with parallel metaphorical phrases allusive to the grand *themethlon* (i. 23; ii. 7). Shaftesbury is earnest and enthusiastic, if we may not say precisely eloquent, in claiming for the arts the same sympathetic harmony with nature which he asserts for morals against those who would represent "that all actions are naturally indifferent; that they have no note or character of good or ill in themselves, but are distinguished by mere law, fashion, or arbitrary decree." "Harmony," he says, "is harmony by nature, let men judge ever so ridiculously of music. So is symmetry and proportion founded still in nature, let men's fancy prove ever so barbarous, or their fashions ever so Gothic, in their architecture, sculpture, or whatever other designing art [as we should now say, art of design]. 'Tis the same case where life and manners are concerned. Virtue has the same fixed standard. The same numbers, harmony, and proportion will have place in morals, and are discoverable in the characters and affections of mankind, in which are laid the just foundations of an art or science superior to every other of human practice and comprehension."

It is not easy to decide what exact sense the author attaches to *Gothic* in this passage; doubtless his general sense is *barbarous*, but his use

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of the word elsewhere seems to require a more special application. It occurs in a passage which evinces a certain almost spiteful feeling against Sir Christopher Wren. It is conceivable enough that even a moral philosopher should take pleasure in raking up satire from the "Rehearsal" to vex Dryden as *Mr. Bays*; for had not the poet unmercifully satirised the philosopher's grandfather and best friend. But what was the offence of the dignified architect? When these cavils were set down the noble structure of St. Paul's had just reached completion, and most of the churches of London had risen from their ruins. Shaftesbury had never seen the Gothic structures which they replaced, though he may have seen some in their ruins; everything points to his preferences tending towards the style of the Renaissance, which would explain regret for the loss of Inigo Jones's Corinthian portico to old St. Paul's, but this passage might have emanated from a modern anti-restoration committee concerned for Early English or Late Decorated.

"As for architecture, 'tis no wonder if so many noble designs of this kind have miscarried amongst us; since the genius of our nation has hitherto been so little turned this way, that through several reigns we have patiently seen the noblest public buildings perish (if I may say so) under the hand of one single court architect; who, if he had been able to profit by experience, would long since, at our expense, have proved the greatest master in the world. But I question whether our patience is like to hold much longer. Hardly, indeed, as the public now stands should we bear to see a Whitehall treated like a Hampton Court, or even a new cathedral like St. Paul's. Almost every one now becomes concerned, and interests himself in such public structures." In the meantime, he notices that the reparation of the metropolitan churches was hastened; "and since a zeal of this kind has been newly kindled amongst us, 'tis like we shall see from afar the many spires arising in our great city with such hasty and sudden growth as may be the cause, perhaps, that our immediate relish,—[his odd word for taste],—shall be hereafter censured as retaining much of what artists call the Gothic kind." Shaftesbury died before Wren was superseded in his surveyorship, but it may be doubted whether, had he survived to a good old age, he would have had reason to hail the advent of a superior architectural genius. Many a generation passed before "two of the noblest subjects for architecture,"—which he noted as still left open "by the good fate of the nation,"—were undertaken, "our Prince's Palace and our House of Parliament."

Let us conclude with an extract from following pages which are nearer to our sympathies, pages worthy of the pupil and friend of Locke and Somers, who had recently co-operated in the happy establishment of constitutional Government and national self-respect.

"In reality the people are no small parties in this cause. Nothing moves successfully without them. There can be no public but where they are included. And without a public voice knowingly guided and directed, there is nothing which can raise a true ambition in the artist; nothing which can exalt the genius of the workman or make him emulous of after-fame, and of the approbation of his country and of posterity. For with these he naturally, as a free man, must take part; in these he has a passionate concern and interest raised in him by the same genius of liberty, the same laws and government by which his property and the rewards of his pains and industry are secured to him and to his generation after him."

It will be observed that public opinion when unadvised is by no means assumed to be infallible, and so the influence of a court is not to be despised, under conditions. "What encouragement our higher powers may think fit to give to these growing arts I will not pretend to guess. This I know, that 'tis so much for their advantage and interest to make themselves the chief parties in the cause that I wish no Court or Ministry, besides a truly virtuous and wise one, may ever concern themselves in the affair. For should they do so they would in reality do more harm than good; since 'tis not the nature of a Court (such as Courts generally are) to improve, but rather corrupt, a taste. And what is in the beginning set wrong by their example, is hardly ever afterwards recoverable in the genius of a nation."

One more architectural allusion may be gleaned from the Book of Revelations. In the missive to the angel in Pergamum, in the second chapter, we read:—"I know thy doings and where thou dwellest, even where is the throne of Satanas." We can scarcely be wrong in recognising an allusion here to the vast substasement ascended by many steps, adorned with the sculptured wars of the gods and giants, of which such remarkable remains have recently been discovered, and surmounted by an altar certainly, and probably with a statue of Zeus (Jupiter), to whom it was dedicated. The remains attest an ascent of 24 ft., and go far to justify the full height of 40 ft., which the notice of Ampelius ascribes to the complete structure.

RICHMOND CASTLE.*

Returning to the entrance-lobby, the staircase to the upper floors is seen to be straight, and carried up by a vaulted passage in the thickness of the south wall, where it is lighted by two loops. At the head and end of the staircase, also in the south wall, has been a door, now converted into a loop, a Perpendicular alteration. The loop is splayed hour-glass fashion, inside and out. It is difficult to understand for what purpose this opening was intended. It seems original. At Scarborough a somewhat similar door opened on the roof of the tower covering the entrance; but, to judge from the surface of the exterior wall the tower did not rise to this height. Opposite to this opening a door opens into the second floor.

This floor is about the same size with those below. It is lighted very sparingly, by two splayed loops in the east wall and one in the west, all high up. Under one of these loops at the north end of the east wall a door leads to a mural chamber, now fastened up, but which seems to be lighted by a loop in the east wall. In the west wall, near the south end, and close to the door entering from below, a small door opens into a narrow mural passage, which runs, like a triforium, the whole length of the north wall. This gallery is widened at its south end into a chamber 7 ft. 6 in. long, lighted by two loops, to the south and west. The north end forms another chamber, much longer, lighted by one loop, to the west. These may have been garderobes, though no shafts are now seen. They are too narrow for bedrooms.

Besides the three doors mentioned is a fourth in the south and of the east wall, which opens into a mural lobby, whence a stair, similar to that below, ascends to the south wall. The lobby has a loop in its east wall, opposite the stair-foot, and the stair has itself four loops in the west wall. This staircase does not, like the lower one, stop at the west wall, but it has a door on the right which opens into the third floor, in its west wall, and beyond this it ascends in that wall to the battlements. It is said that the north-east angle of this floor also contains a mural chamber, but if so, it has no exterior loop.

The present and recent roof of the building is laid at the floor-level of the third floor, which is therefore at present open above. Here the evidence of the exterior masonry is confirmed, for two water-tables remain along the base of the north and south wall, showing, as at Porchester, that the second floor was originally the upper one, and that the keep has been raised one story. Like Porchester, also, it is evident that the addition was made in the Norman period, and, therefore, probably not above fifty years later than the original work. The wall is as thick as that on which it rests, or about 10 ft. How the added story was lighted, or whether it has any mural chamber is not apparent, as an examination is not permitted. One only opening, a loop, is seen in the east wall, near its north end, and the stair in the west wall has two loops looking into the chamber, but there are no traces of regular windows, though there is a curious hagioscope sort of opening in the staircase, near its summit.

The turret at the stairhead, that to the north-west, has a flat-headed door beneath a round-beaded relieving arch. These turrets are open below, and the rampart wall passes through them. Their upper floors were probably reached by ladders.

Such is Richmond keep, resembling other Norman keeps in its rectangular plan, its pilaster buttresses, its angle turrets, and its entrance on the first floor. Peculiar in its enormous archway in the basement, in the absence of any original spiral stair, fireplace, or visible garderobe, in the position of its door in a hollow angle, its approach from the rampart, and the absence of any regular fore-building or barbican tower attached to the entrance side. Probably, indeed, the large arch opened, as a small one in the basement does at Porchester, into an attached chamber, of no great height, and carrying a platform at the level of the adjacent ramparts, and having its own door into the inner ward.

The main ward of the castle seems always to have been clear in the centre. The buildings were placed against its curtain, probably along all three fronts, and certainly along those to the east and south-east. The curtain abuts upon the keep, and its ramparts are on the level of the first floor. Proceeding westward from the keep, the curtain, though mutilated, is tolerably perfect for about twenty-five yards. Then, along the west front follows a breach of forty yards, and thence the wall is tolerably perfect to the south-west angle.

Though much altered and repaired, there are traces of flat pilasters outside, and inside are two rather peculiar features, one a large opening the arch of which is nearly a half-circle, and which may possibly have been connected with the principal or garrison chapel of the castle, which there is reason to believe stood near this point. It was founded in 1278 by Earl John, and services was performed there by six chaplains supplied from Egliston. Below this, at the ground level, is a flatter segmental arch, now walled up. These may have been fireplaces, but they do not look like it. The lower certainly had nothing to do with a postern. They appear original.

The south-west angle is capped by a rectangular turret of moderate size, and of Norman origin. It stands upon the cliff, which here commences. From hence, along about three-quarters of the south front, the curtain appears to have rested upon a revetment wall, filling up the natural irregularities of the rock, and crowned probably by a low parapet, a high wall inside being scarcely necessary. Part of this wall has fallen down the cliff. This seems to have been apprehended at an early period, for other parts of the wall have buttresses which savour of the Decorated period.

The principal domestic buildings, hall, kitchen, and chapel, stood near the south-east corner of the ward, and were built against either wall. They extended about forty-five yards along this southern front, the curtain being raised to support them. Of these buildings the most perfect is the great hall, "Scollands Hall." This is an oblong of about two squares, the curtain forming its south side. The basement, probably a store, has a door near the middle of the north side, and each side is furnished with loops. At the floor level, but high up on the outer side of the curtain, about 30 ft. above the present walk, is a range of square holes, probably for the support of a timber balcony or bretasche for the defence of this important quarter. The upper floor or hall was entered by an exterior stair on its north side, near the west end. It had a wooden floor and roof, the latter probably flat, the rather elaborate Norman corbel table remaining, and there being no trace of grooves or lower corbels for the principals of a high roof. There is a high narrow window, possibly one of a triplet, at the west end, and at the east end were probably the gallery and kitchen. The north and south walls were pierced by a range of coupled round-headed windows, five on the south, and four, leaving space for the door, on the north. The most eastern in each wall has been superseded; the one by a large Decorated window, the other, in the north wall, by a door, also in the Decorated style, connected with some exterior additions, also Decorated. There is no fireplace. A circular staircase in the north-west angle leads to the roof.

The south-east angle of the ward is capped by a similar turret to that at the south-west angle. The space that intervenes between this angle and the east end of the hall is divided into two floors. The upper, probably a withdrawing-room from the hall, seems to have undergone some alterations in the Early English style. The basement leads to a postern in the base of the turret, opening to the east ward. This postern is a rather large Norman doorway, evidently of the age of the curtain. The kitchen seems to have been placed against the curtain, north-east of the hall, and beyond it is the Norman shell of a chapel. The east wall of this being the curtain, there is no east win-

* See p. 613, *ante*.

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dow; but on the south side is a trefoil-headed Decorated piscina, and the western window seems to have been in the same style. The chapel is on the first floor; floor and roof being of timber. This, and the adjacent fragments of buildings, seem to have been much altered in the Decorated period.

Following this very remarkable specimen of an early Norman curtain from the postern northwards, there are seen a number of curious square-headed doorways, under rounded relieving arches, in the base of the wall, leading into mural cavities, now mostly choked up with rubbish. Some are probably garderobes; one seems to contain a stair leading up to the ramparts, such as may be seen in the keep at Tamworth. Near the middle of this front is a rectangular tower, of no interior projection; and north of this a small original doorway, now rather below the ground level, opens direct into the west end of a very remarkable mural oratory, of Early Norman character,—a very curious chamber indeed. This is 13 ft. long by 10 ft. wide, and 12 ft. high, and therefore very small, rectangular in plan, and roughly barrel-vaulted. A very heavy rude round-headed arcade occupies the north, and is continued along the west wall, interrupted by the doorway, and then along the south side. The east window is a splayed loop in the curtain, below the cill of which was the altar, and on either side of it a small circular window, much concealed by rubbish. On each side of the loop, in the splay, is a rude square hole,—no doubt for a beam to support a rood. This oratory is the Chapel of St. Nicholas, and is entirely contained within the curtain, here of very great thickness, and supporting what remains of a quadrangular mural tower. Of the same thickness the curtain was continued to the keep, and it contains several cells similar to the oratory, but which have been converted into prisons for the militia, and are inaccessible. Through this curtain, close east of the keep, is the main entrance to the castle. This was a large Norman archway in the curtain, without gatehouse or flanking tower other than the keep, which, indeed, completely protected one side of the approach. Recently this gateway has been modernised, and its details removed, but the opening itself, and the curtain through which it passes, are original.

It is said that some excavations made half a century ago outside this gate, showed the ditch, and the piers of a drawbridge, which is likely enough.

Outside and abutting upon, but not bonded into, the west wall of the keep the main curtain is seen. It is of rude masonry with some courses of stone laid obliquely on edge, a sort of half herring-bone work, and probably of the date of the founder of the castle, and certainly older than the keep. A rough place on this wall shows whence sprang the wall of the barbican. The area of this barbican is now open towards the town, and any one may enter it, but if he produce pencil and paper, and proceed to take notes of what he sees, a sergeant from the inner gateway will be upon him, and will inform him, with great politeness, that notes are forbidden, and all access to the interior absolutely out of the question. As the keep has been photographed all round, and impressions may be purchased in the town, this interference seems only intended to annoy visitors. The order is of recent date, but for many years entrance to the keep has been forbidden. Similar orders as to notes are in force with regard to Dover and Scarborough.

It seems perfectly clear from the internal evidence afforded by the remains of the curtain that Alan Fergaunt on receiving the lordship lost no time in selecting this new site, and in walling in the area very substantially. Most of the existing wall, the three mural turrets, the postern, the hall, the oratory, and what remains of the barbican, seem to be his work, and the original chapel near the hall.

Whether Earl Alan began the keep is uncertain. Mr. Milward, in an excellent account of it in the *Arch. Journal*, v. 52, supposes its date to be about 1170, and it is usually attributed to Earl Conan, who died in that year. This may very possibly be the correct view, but the lower part of the keep appears earlier, possibly the work of Earl Alan Fergaunt. The keep is small, compared with the importance of the Honour and fortress, the walls are very thick, the ornaments few and simple, and so far as can be seen, there is no trace of fireplace, sewer vent, or portcullis. The straight staircases are somewhat similar to those seen at Chepstow, Ludlow, Carlisle, and Prudhoe, keeps of various dates, though all Norman. By whom the keep was raised a story is also unknown. The work is of the Norman period, but scarcely by the original builder of the keep, being of inferior quality. If Earl Alan built the keep, Earl Conan probably raised it, but if Conan was the builder, the addition must be due to Geoffrey, or the Earl of Chester, his next successors.

The trifling Early English additions seen about the south-east angle of the main ward, may be due to any of the lords who held the place during the close of the reign of John or that of Henry III. The Decorated additions are far more important, and being late in the style, may be the work of John of Gaunt before 1372. They include the greater chapel with adjacent buildings, and the vault of the basement of the keep. The princes of the House of Lancaster were great builders, and have usually left their marks in the castles which came into their possession.

In the "Registrum Honoris de Richmond" is a birdseye view of the castle, of uncertain date, showing groups of buildings, and upon each building a banner of the arms of the knight whose duty it was to defend it. On the keep are, barry of ten, or and gules; FitzAlan of Bedale; and sable, a saltire or. Over the mural oratory, or, a chief indented, azure, FitzRandolph. Over the postern, argent, a cross engrailed sable; this may be Conan, FitzHenry, or Manfeld. On the hall, barry of six, or and gules. On the kitchen, west of the hall, azure, three chevrons brased, and a chief, or; FitzHugh. Over the south curtain, vair, a fess, gules; Marmion or fitzGernegan. The tower at the south-west angle carries nothing. Over the west curtain is argent, on a fess three bezants. The feudatories said to be represented by these arms, but whose names do not tally with them, are thus placed:—Ranulph FitzRobert, "Placea in Castro Richmondi ad Capellam St. Nicholai"; the Constable, "In claustro turris"; Brian FitzAlan, "In aula de Scolland"; Torphin, filius Robt. de Mansfeld, "Inter coquinam et bracinam"; Ranulph FitzHenry, "In parte occidentali aulæ"; Conan, filius Helias, "Juxta claasum turris ex parte orientali extra muram. Placea Camerarii ex parte orientali de Scolands Hall juxte furnam." Thom. de Burgo, "Ex parte occidentali majoris capellæ ad canonicos in maris." Each tenant *in capite* had a quarter appointed, and further, each had two specified months during which he was to serve.

It seems singular that a family so powerful as that of the old Earls of Bretagne should allow a town founded by them, and under their protection, to remain exposed to the dangers of fire and sword in a district in which the old English feeling was strong. Possibly the town did not immediately follow upon the building of the castle, but so it was that it was not till the time of John le Dreux, who was earl from 1335 to 1341, that we read of town walls. This duke had licence to wall the town, and he cleared away the houses that stood in the way, but the actual walling was a later work. That it was done appears from Leland. The town was small, for the area enclosed did not much exceed that of the castle, which formed a part of the general *enceinte*. There were three gates, of which Leland saw the remains French Gate on the north, Finkel-street Gate on the west, and Bar Gate towards the south, and by the Swale Bridge, at one time crossed by a chain. In the town, or its immediate suburbs, were the parish church and chapels of St. James, Trinity, St. Anthony, and of a female anchorite, besides the chapel in the castle, "with strange figures on the walls of it." There was also the Grey Friars. Grose gives a moderate account of the castle, with a plan and two views, in 1786. He shows some buildings close west of the hall, of Norman aspect, and others north of the chapel, all now gone. Whittaker, in his valuable history of the Shire, gives a view of the keep and a history of its descent.

A few years ago the castle was a ruin, but one open to every visitor, and so strongly built that the hand of Time lay upon it but lightly. A few years ago some unfortunate economist persuaded the authorities to build barracks within the enclosure, and to fit up the keep as a militia store, and the ante-chamber to the hall as a powder-magazine. Of course, with the natural instincts of authority, those who desire to explore the details of these parts are excluded. This is bad enough, but there is now, or was a short time ago, a project for further utilising the area, pulling down the eastern ward wall for new school buildings, and making other alterations and destructions, the effect of which would be to destroy the peculiar value, in an historic point of view, of one of the most remarkable of the purely Norman fortresses in England. These words, and the substance of the preceding account, were written some years ago, when access to the castle court was allowed, but that to the keep only to be obtained, and that partially, with difficulty; but now, since the building of the new and large barracks outside the town, all entrance to any part of the castle is forbidden.

Why cannot the burghers of Richmond, those educated in its famous school, and the broad-acred gentry and nobles who regard the town as their provincial capital, resist these absurd restrictions, convert the keep into a local museum, and lay out the area and slopes in public walks and gardens? The walk already laid out above the river is a specimen of what might be done, and the happy thought that formerly converted the base of the keep into a reading-room, and saved it from the militia tailors, points in the right direction.

G. T. C.

THE PROPOSED NEW APPROACHES TO THE STRAND.

A SEQUEL.

In the *Builder* of last week appeared an article on some proposed "New Streets and Communications between Holborn, the Law Courts, and the Strand"; the following paper is intended as a sequel to that article by briefly recording some of the more notable places and buildings that will be trampled out of existence by the march of these improvements.

Passing from the Strand between the Palace of Justice and Clement's Inn we enter the southern end of the line of one of the new streets. Traversing Clement's-lane and Gilbert-street,* we have Portsmouth and Portugal streets on our right, and Clare Market and Vere-street on our left. Of Portsmouth-street there is little to tell beyond that, at the Black Jack public-house,—still to the fore,—Joe Miller cracked his jests probably in the hearing of two notorious rascals, Jack Sheppard and Jonathan Wild, who frequented the house. In Portugal-street (Roque's plan) was the play-house. Sir William Davenant, in his epilogue to "The Play-house to Lett," tells us that his theatre was

"Behind the Row which men call Portugal,"

Portugal-row being the old name for the southern side of Lincoln's Inn-fields. William, Earl of Rochester, who died in 1680, in writing to a friend, says,—"If you write to me you must direct to Lincoln's Inn-fields, the house next to the Duke's Play-house in Portugal-row; there lives your humble servant, Rochester." Howell, the compiler of "Londinopolis," tells us that there "is towards Drury-lane a new market, called Clare Market; there is there a street and palace of the same names, built by the Earl of Clare, who lives there in a princely manner, having a house, a street, and a market, both for flesh and fish, all bearing his name." It is recorded by Aston that Anne Bracegirdle, the famous actress of two centuries ago, who resided in Howard-street, Strand, was in the habit of going often into Clare Market and giving money to the poor unemployed basket-women, insomuch that she could not pass that neighbourhood without the thankful acclamations of people of all degrees. Clare Market one hundred and sixty years ago could hold up its head against any market in London: it "was very considerable and well served with provisions; for besides the butchers in the shambles it is much resorted to by the country butchers and higglers. The toll belongs to the Duke of Newcastle." At the spot where all the above streets diverge, a circus is laid down in Mr. Hayward's plan.

Leaving the circus and turning to the west we enter Vere-street, a large portion of which was built on lands called St. Clement's Fields, and one of the earliest erections was a bowling-alley and tennis-court in Bear-yard, named so, doubtless, in consequence of the premises being

* See *Builder*, June 10, 1882.

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occasionally used for bear-baiting. The tennis-court, built by Charles Gibbons, communicated with Vere-street by the passage which still exists at the north end of the School Board schools. In Shadwell's play of "A True Widow," 1679, occurs a reference to it: "Engaged! No; faith let us make a match at tennis to-day. I was invited to dine by two or three lords, but if you will let me have pen, ink, and paper I'll send my despatches and disengage myself. How will that gentleman and you play with Stanmore, and I keep his hand back at Gibbons's?" In 1660, on the site of the tennis-court, was erected a small theatre, the first built after the Restoration, and on Thursday, November 8, of that year it was opened with the play of "Henry IV." by the company from the Red Bull, John-street, Clerkenwell, under the direction of Killigrew. Reed tells us more than one special event in the history of the drama has given some importance to this theatre. On Saturday, December 6, 1660, at the performance of "Othello," the first time that season, "it is probable an actress first appeared on the English stage." The prologue spoken on the occasion is still extant. It is entitled, "A Prologue to introduce the first Woman that came to act on the Stage in the Tragedy called 'The Moor of Venice.'" The part undertaken by the adventurous lady was *Desdæmona*. In this theatre Killigrew's company remained till the opening of the "New Theatre in Drury-lane," by Killigrew in the second week of April, 1663. While at the theatre in Vere-street his company obtained the title of "The Kinge and Queene's Company of Players." After the removal it does not appear that the house was again used for dramatic representations. Davenant, who shortly afterwards produced his "Playhouse to Lett," alludes to it by making a musician say,—

"Rest you merry,
There is another playhouse to lett in Vere-street."

Probably it remained unoccupied till John Ogilby took advantage of it, as standing in a popular and fashionable neighbourhood. In the *Gazette* of May 18, 1668, "Mr. Ogilby's Lottery of Books opens on Monday, the 25th inst. at the Old Theatre between Lincoln's Inn Fields and Vere-street, where all persons may repair on Monday, May 18, and see the volumes and put in their money." On May 25th, there appears in the *Gazette*, "Mr. Ogilby's Lottery of Books (adventurers coming in so fast that they cannot in so short time be methodically registered) opens not till Tuesday, the 2nd of June." Ogilby styles it the "Old" theatre to distinguish it from the two neighbouring edifices in Portugal-street, the "Duke's Playhouse," on whose site stands the College of Surgeons, and "Drury Lane." A word about John Ogilby, who, among his many works, has left us many Surveys of England, and notably a plan of London. He was born at Edinburgh in 1600, and while yet a youth removed with his parents to London. His unthrifty father was thrown into the King's Bench Prison for debt, and John became apprentice to a dancing master. In 1633, when Earl Strafford went to Ireland as Lord Deputy, Ogilby accompanied him as dancing-master to his children. He danced himself into high favour until the rebellion of 1641, when ruin fell upon him and he returned to London destitute. He wrote many poems, but none of a high class. At the age of fifty-four he learned Greek, and in 1660 he published a magnificent version of Homer's "Iliad," dedicated to Charles II., with engravings by Hollar and other artists. By his interest at court he was appointed Cosmographic and Geographic Printer to the King. He erected a printing-office out of the proceeds of his lottery, 4,210*l*. He died in 1676.

Another change passes over the Vere-street Theatre. The players are succeeded by the Puritans. In 1675, the parish rates paid by the widow of "Charles Gibbons, esq.," hostess of the Bull's Head in Vere-street,—the site now covered by a portion of the School Board school,—and proprietress of the Bear-yard, are entered for the Tennis Court, which might be an error of the collector, who could not remember "such things were," as in the following year it is fitly described as "The Meeting-house." The same title occurs in 1682, when, in consequence of an Order in Council for the suppression of conventicles, several attempts were made by the constables to take into custody the preachers who held forth at the "Old Play-house in Vere-street." The building must have been very substantial, as it remained till 1809, when it was destroyed by fire. The new street will sweep away Bear-yard, and, passing onwards, enter Duke-street at the side of the Roman Catholic Chapel, on the site of a former chapel, demolished by the "Gordon rioters" in 1780. Opposite this chapel lived Benjamin Franklin when employed as a journeyman printer at Watts's office, some say in Lincoln's Inn-fields, and others at the corner of Wild-court,* Wild-street. Crossing Duke-street, the new road will take away a portion of the gardens pertaining to the houses on the west side of the fields, and among them those of Lindsey House, built by Inigo Jones for Robert Bertie, Earl of Lindsey, General of the King's forces during the Civil War. The fourth earl was created Duke of Ancaster, and the house took that name for awhile. The duke sold it to the Duke of Somerset. "Old Somerset is at last dead," writes Horace Walpole in 1748; "to Lady Frances, his eldest daughter, he has given the fine house built by Inigo Jones," &c. Away, too, will go a portion of the grounds of Powis House, in the north-west angle of the Fields. It was built in 1686 by William Herbert, Viscount Montgomery and Marquis of Powis, and forfeited by him to the Crown for his steady adherence to the ill-fated James II. For a short time it was in the possession of the great Lord Somers. It was subsequently sold to the Duke of Newcastle and took his name. Walpole informs us that the architect was Captain William Winde, a scholar of Webb, the pupil and executor of Inigo Jones. At one time the Government had an intention of purchasing it for the official residence of the Great Seal. Having thus curtailed the gardens, the road emerges in Great Queen-street, and is continued along Little Queen-street into Holborn. It was along Little Queen-street that William, Lord Russell, passed to the scaffold in Lincoln's Inn-fields. Bishop Burnet, in his journal, writes:—"As we came to turn into Little Queen-street, he (the king) said, 'I have often turned to the other hand with great comfort, but I now turn to this with greater,' and looked towards his own house; and then, as the Dean of Canterbury, who sat over against him, told me, 'He saw a tear or two fall from him.'" The image of his wife, the pure and loving Rachel Russell, the grand-daughter of Shakspeare's Earl of Southampton, rose before him. It was through her he inherited Southampton, afterwards known as Bedford House, which occupied the whole of the north side of Bloomsbury-square. It was sold by auction on May 7, 1800, and immediately afterwards pulled down.

Another proposed route from the Strand commences between the Church of St. Mary-le-Strand and the western end of the block of buildings lying between the Strand and Holywell-street, passes through Newcastle-street, so named after John Holles, Duke of Newcastle; cuts through Houghton-street, where formerly stood the residence of William Holles, created Baron Houghton in 1616; then onwards, right through the centre of Holles-street, so named after the above-mentioned William Holles; thence through the eastern portion of Clare Market, reaching the circus at the foot of Vere-street.

The Vere-street line, which leads to Long Acre, is continued through Great Wild-street, formerly Weld-street, in which was the family mansion of the Welds of Lutworth Castle. It stood partly in Wild-court and Little Wild-street. The following is an extract from the inscription engraved on the plate affixed to the printing-press at which Benjamin Franklin worked during his first residence in London:—"Dr. Franklin's remarks relative to this press, made when he came to England as agent of the Massachussetts, in the year 1768. The Doctor at this time visited the printing-office of Mr. Watts, of Wild-street, Lincoln's Inn-fields, and going up to this particular press . . . . thus addressed the men who were working at it,—'Come, my friends, we will drink together. It is now forty years since I worked like you at this press as a journeyman printer.'"

Another line leads from the Circus, cuts off a large portion of Portsmouth-street, passes through the forecourts of the houses on the west side of Lincoln's Inn-fields, and thence along Gate-street, through the block of buildings on the west side of Little Turnstile, into Holborn. Gate-street in Roque's plan (1730) is called Yeate's-street, and the site occupied by the music-hall in Holborn, on the east of Little Turnstile, is marked "A Tennis Court."

Samuel Pepys was quite familiar with all the localities we have mentioned, being on terms of friendship or acquaintanceship with most of the noblemen and gentlemen we have referred to. In his diary, "November 20th, 1660. To the new play-house near Lincoln's Inn-fields (which was formerly Gibbons's tennis-court), where the play of 'Beggars' Bush' was newly begun, and so we went in and saw it well acted; and here I saw the first time one Moone [Mohun], who is said to be the best actor in the world, lately come over with the king, and, indeed, it is the finest play-house, I believe, that ever was in England." Another entry,—"To the theatre [in Gibbons's tennis-court], where was acted 'Beggars' Bush,' it being very well done, and here the first time that I ever saw women come upon the stage."

The district to be traversed by these proposed streets illustrates more vividly than other portions of the metropolis the changes and vicissitudes in the lives of houses and their inhabitants. From Clement's-lane, the "Bond-street" of the west, the lounge and promenade of the courtiers, cavaliers, and high-born dames in the days of the Charleses, right on through Clare Market, Vere-street, and Wild-street, the glory has departed, and poverty and squalor have taken its place. The mansions in Lincoln's Inn-fields echo no more the revelries of titled birth and wealth: the walls, once hung with tapestry and ancestral portraits, are now hidden by piles of deed-boxes, and it may be that the lawyer pens his brief in the very room where the Duchess of Newcastle wrote,—in the judgment of Pepys,—"the silliest play that ever was writ."

* Both may be right, "Lincoln's Inn-fields" being often used in a very comprehensive sense.

FROM PARIS.

THERE is much that is suggestive in the recent Paris upholsterers' strike, which, after assuming a very threatening aspect, has now, for a time at least, been amicably arranged. In a measure the men may be said to have gained the day, but only through the disunion of the masters, who, after much altercation, having formed themselves into a general assembly, do not appear to have found their respective views universally acceptable. The masters, therefore, having once again acquired their liberty of action, have opened their shops, and business has been resumed. Such, after a great deal of bad feeling and misunderstanding on both sides, is the upshot of an affair which has, in no small measure, been exaggerated in certain quarters, but the real bearings of which have, we suspect, been to a great extent overlooked. The men have unquestionably cause for complaint. The rise in house-rent, in common with the other requirements of existence, which has accompanied the improvements of late years in the French capital, has afforded particularly a not unjust ground for a demand in the increase of wages; while, on the other hand, the masters urge, with no less justice, that the competition of foreign rivals daily reduces their profits and compels them to the most continuous and watchful attention. The Faubourg St. Antoine does not, as in the past, enjoy the largest share of the furniture trade; England, Belgium, Germany, and Italy, have, of late been most successfully rivalling France. The daily talk of art, and the constant discussion of the question in its commercial bearings, have produced at length their results, and while the rest of the world has been advancing, France has relied too confidently on the reputation she gained in the past, when there existed little or no rivalry. The French, as we have more than once pointed out, are commencing to wake to this fact, and such a strike as that which has lately disturbed the busy Faubourg St. Antoine has served, let us hope, not a little to open the eyes of those who gain experience by such events. It is certainly significant that during the recent strike the report was circulated that orders of considerable importance had been given to foreign firms, among them some English houses, to supply the French market with work which Frenchmen have, for a very long time, considered it necessary to receive alone from the Faubourg St. Antoine.

Such unseemly disputes as these are unlucky for France, which of late years has been run hard in the competitive race. The complaint is now constantly being expressed in France of the alarming progress of foreign nations in the

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production of those very objects of which up to this time France has considered herself to enjoy a monopoly. The last form which this alarm has assumed is the determination, recently arrived at by a meeting of the various trades-committees, of the necessity for the formation of some association which shall gather abroad all information interesting to the French manufacturers at home. The foundation of a special trade museum, such as exists already in Belgium and in Italy, has been further urged. The preparation of such required reports is, it is true, essentially a large share of the work which consuls are required by their respective Governments to send home, and which not long since the United States, it may be remembered enjoined as a necessity on all its consular agents. But useful and instructive in many ways as are the consuls' reports, they are certainly not sufficiently made known to the public; the very irregularity of their publication, the nature of their contents is far from satisfactory and is eminently unpractical. Our French neighbours complain of their consuls' reports, as doubtless do our manufacturers. As a further aid to the more constant and regular returns which would be made by the proposed appointed body of foreign agents, it is suggested that a commercial museum should be immediately commenced, on the plan of that which has been in existence in Brussels for two years past, and has met with admitted success. Italy, it would appear, followed the example of Belgium,—the feature of the commercial museum formed one of the attractions of the recent Milan exhibition,—and in Holland at this moment the formation of a similar museum is under discussion. The formation of an association of Chambers of Commerce with agents in every country, and the foundation of a commercial museum in Paris and in each of the principal centres, such is the suggestion put forward. In the present day of active competition the information thus gathered by the association would be invaluable to the manufacturers who have been (with the public indirectly) perhaps the chief gainers by the series of recent international exhibitions. England may find in the suggestion some points worthy of notice; for our future prosperity largely depends on the continuance of our power to compete with the rest of the world.

The interesting discovery made some time since in Poitou of a large Roman "spa,"—a discovery reported at the time in these columns,—has now found its counterpart in an even more interesting discovery of a Roman city at Eining in Bavaria, and of which the supplement of the *Allgemeine Zeitung* of the 16th inst., contains a lengthy account. While from the last report of the progress of the Poitou excavations,—as made at a recent meeting of the French Academy of Inscriptions,—it would appear that little of fresh interest has been unearthed, and scarcely any antiquities or objects of art, in the Bavarian find, the yield of these is beyond anything that has yet been discovered in Germany. The existence of Roman remains in the neighbourhood of the spot, not far from Landshut, has long been known to the inhabitants and the archæologists,—the great wall which the Romans built to keep out the German tribes having passed through the district,—but it is only within two or three years that any serious search has been made. Brilliant success has come to crown the efforts of the exploring party. Some idea of the importance of the recent discoveries may be judged by the statement that the remains of a building some 60 yards long by 30 yards broad have been brought to light. Such a discovery has never before been made in Germany. The bricks bear each, in accordance with the Roman custom, a stamp which determines their date, these bricks bearing the mark of the "Cohors prima Flavia Canathenorum" and the "Tertia Italica legio." This would settle the date of the building as about the time of the Emperor Marcus Aurelius,—161-182 A.D. The walls of the building (so our informant states) are painted red, brown, yellow, and green; the pavement and the heating apparatus are in excellent condition, as indeed is all that has been discovered, and not least interesting a large quantity of thick window-glass has been found; such a mass of flue-tiles have, it is stated, never before been discovered. It is suggested, pending further research, that the building served as a Casino or sort of club for the military station, which was posted here on the frontiers of the Roman empire. It may be mentioned, by the way, as specially interesting to English readers, that among the bricks found were some bearing the stamp of the third British cohort. The yield of small objects is reported as most rich, vases, drinking-vessels and cooking-utensils, cups, glasses, hair-pins of bone, *fibulæ*, bracelets, knives, scissors, rings, keys, bells, tools, &c., and a most important find of arms. But to continue the excavations, as at our recently-discovered Roman villa at Brading, money is required. Our German relations are more universally interested in archæology than we, and we suspect that in a case of such importance there will not be wanting ample funds to prosecute the inquiry now that an appeal has been made to the public.

Though the recent stormy debates which have been taking place in the French Chamber respecting the State remuneration of the clergy, are eminently outside the interests of art and archæology, one feature in the discussion is worthy of attention. An amendment was urged by a deputy,—so we learn from the *Journal des Débats* Parliamentary report of the 18th inst.,—to reduce by half the sum of two millions of francs (80,000*l.*) set down in the proposed budget, "for the purchase of buildings, repairs to religious edifices, &c." Every one will be pleased to hear that the very proper indignation of the French Minister of the Interior at this attempt to reduce the sum devoted to such a purpose as the repair of "monuments, which are the artistic honour of the country," was warmly responded to, and the amendment rejected by an overwhelming majority.

We are glad to hear the announcement in connexion with the Louvre of a series of Sunday lectures to be delivered at the museum, in the course of the next few months. On the committee formed to further this object we meet with the names of several distinguished painters and a number of most eminent men of letters. The first lecture, it is stated, will be delivered on the first Sunday in December. Our neighbours, it will be seen, not content with throwing open their museums on Sunday, are anxious to turn their stores of information to even greater account by the intelligent explanation to the public of the real value of the national gatherings, not alone as objects of curiosity, but as objects of study. We have not yet got further than the stage of violent opposition to the proposal even of having our museums open on the only day when many thousands are alone able to profit by the collections which are amassed with the funds of the public.

The latest news from Assos announces,—we have the authority of a recent issue of the New York *Critic*,—the satisfactory progress of the American expedition. Extensive and interesting remains of ancient baths have been laid bare, the description of which will form one of the features of the next report of the Archæological Institute of America. August and September last were occupied by Mr. Hughes in obtaining a series of photographic views for the expedition, and it is expected that all the necessary work of exploration will be finished by the end of the present season. The Institute intend to publish a bulletin which, in addition to other matter, will contain a full account of the last summer's work in Asia Minor.

In a more recent issue of the same admirable publication the *Critic*, will be found some very suggestive remarks on the question of modern architecture, in connexion with the typical architecture of the French Renaissance and its effective character. "We will have to get our large architectural effects by happy chances, and the coming together of different buildings. Perhaps the time will come when builders and architects will consult adjacent edifices before settling the design of a building, and use great care that not its forms only, not only its masses and outlines shall fall agreeably with the broader effects of streets and squares, but that its colour shall be such as in a general view to delight the eye, not jar upon it." Our cousins are earnestly considering these questions, and not without reason, when one hears of the rapidity with which houses are being built in the Empire City; how comes it, however, that with this announcement, reaches us from another source the sad wail that what are most wanted in Manhattan are not merely houses, but homes?

Stained Glass.—Two Munich windows by Messrs. Mayer & Co. have just been erected in the parish church of Downham, Norfolk, representing the Agony in the Garden and Christ's appearance to Mary Magdalene.

ARCHITECTURAL REMAINS IN CYPRUS.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary general meeting of this Institute, held on Monday evening last, Mr. Horace Jones, President, in the chair,

Mr. E. I'Anson, Vice-president, read a paper on "The Mediæval Buildings of Cyprus." He observed that having read a recent work by the Chevalier Cesnola on the antiquities of Cyprus, he determined to visit the island to see some of the architectural remains which were referred to by that writer, in the hope of discovering some fragments of Greek architecture. In this, however, he had been disappointed. Having described the geographical position of the island, and shown that it was located in the midst of the great nations of antiquity, he remarked upon its successive occupation by the Phœnicians, Greeks, Romans, and Crusaders, who had all left behind them traces of their occupancy. The history of the many changes which took place in the occupation and government of the island had been recorded by competent writers, extending as far back as Herodotus and Aristotle. Richard Cœur de Lion took the island in 1191, and sold it to Guy de Lusignan, a French Crusader. Subsequently it passed successively into the hands of the Genoese, the Venetians, and the Turks, who conquered it in 1571, and to whom it still belonged, though it had been during the last few years under British administration. The few remains which existed of a prior date to those of the Romans were probably Pelasgic. Of Arabian remains the lecturer had been unable to trace anything like the works of which the Arabs had left such fine examples in Cairo. The Turks appropriated to their own uses the buildings which had been erected during the time of the Lusignan kings, but removed all the stained glass from the windows, replacing it with thin perforated slabs of stone or plaster of Paris. Among the earliest remains in the island were the tombs, some of which were partly hewn out of the rock, and partly formed of gilt masonry. One large tomb near Larnaca measured 33 ft. long by 23 ft. wide, and was arched over with stonework of the rudest construction, somewhat resembling that of the Treasury of Atreus at Mycenæ. This tomb had an inner chamber which was entered through an archway, the soffit of the arch being hollowed or carved out upon the under side of a huge lintel. Running round the interior of the larger chamber was a cavetto moulding very similar to those seen in the interiors of Egyptian temples. Numerous other tombs existed near Salamis, at Citium, at Paphos, and in the immediate vicinity of Nicosia. The roof of one which Mr. I'Anson saw opened was formed either of sloping stones or was carved out of the solid rock. Nothing was found in the tomb, as it had apparently, like others which had been explored, been diligently ransacked. Nevertheless, there were probably to be found some tombs which had escaped spoliation. The lecturer found near Larnaca an Ionic column, and at Paphos a number of Roman columns, apparently part of the portico of a temple. These columns, which were about 2 ft. 6 in. in diameter at the base, and about 20 ft. high, were of a dark-coloured granite. They presented indications of being late Roman work. The lecturer saw a Corinthian capital sufficiently preserved to enable it to be identified as Roman Corinthian. Some columns were standing at Nicosia carrying Doric capitals of Renaissance character. At Famagusta were some remains in the Italian Renaissance style. At Salamis there were remains of a large building, 60 ft. by 180 ft., which seemed to have had a lower vaulted story. Near Nicosia the lecturer saw some remains which he attributed to the Roman period. These comprised walls, 16 ft. or 17 ft. thick, composed of huge stones. There were also to be seen the remains of very large tanks formed in the rock, the stucco with which they were lined being even now quite perfect. These tanks reminded him very much of the tanks at Pozzuoli, near Naples. Cesnola recorded that at Kuchlia he had found the site of a temple of Venus, 167 ft. long, but he (the lecturer) had visited the site without being able to trace the temple. The temple was probably anterior to the Roman Emperor Vespasian. There were considerable remains of the outer walls which formed the boundary of the precincts of the temple. Here, as at Salamis, the ground was thickly strewn with stone which exhibited no sign of having

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been used in building. There exist the remains of a very fine group of churches, which must have belonged to the time of the Lusignan kings. The climax of their prosperity seemed to have been reached about the middle of the fourteenth century. A German pilgrim who visited Constantinople about the time had left it upon record that he was more struck by the wealth and activity which he beheld in Famagusta than he was by what he saw at Constantinople. This, then, must have been the period when the numerous churches were built, the ruins of which were so frequent in the now almost deserted town of Famagusta. In Nicosia the Turks had used some of the churches as mosques and some as storehouses. Nicosia contained the cathedral Church of St. Sophia, the Church of St. Catherine, and the Church of St. Nicholas. Both of the first-named were used as mosques, and the third as a storehouse for grain. The cathedral at Famagusta had been illustrated recently in the Architectural Association Sketch-book, from measured drawings made by Mr. Sydney Vacher. Neither of these churches had any transepts, neither was there any triforium. A peculiarity of their construction was that they never had any other covering external to the stone vaults,—no roofs of carpentry-work. The French architects by whom these churches were designed and built no doubt found all the buildings of the country covered with flat roofs, and, while following the style of their own country, they adopted the flat roofs which prevailed in Cyprus. The Cathedral or Mosque of St. Sophia at Nicosia measures internally from east to west 232 ft., its total width being 87 ft. The east end was semicircular inside, semi-octagonal outside. The height of the nave Mr. I'Anson calculated at 67 ft., and that of the aisles at 35 ft. The style of the building throughout was Decorated. This church had the peculiarity of a door formed at the east end, and one also on the north side. The masonry of these doorways was of marble, but the architectural details corresponded very closely with those of the other parts of the church, which were of a very fine hard limestone. M. de la Mas Latrée, Director of the École Nationale des Arts de Paris, had published a list of more than one hundred gravestones or slabs in the churches, containing inscriptions and coats of arms, and bearing dates ranging from 1255 to 1533. These stones were, in the churches now used as mosques, covered by carpets. Many of the persons commemorated by them fell in the great plague which afflicted Europe in 1348. The church of St. Catherine, not far north of the mosque of St. Sophia, measured 57 ft. in length by 28 ft. wide. The height was calculated at 52 ft. The nave had vaulted compartments. The east end was semi-octagonal. The side and west windows were in the best style of the Decorated period. The buttresses were masked by converting them into semi-octagonal projections. On one side of the church are indications of a cloister and other buildings, probably conventual. Of the church of St. Nicholas the author was unable to give any detailed account. It extends about 130 ft. in length. It had three eastern apses, and an octagonal domed tower in the middle of the building. Its plan was probably that of a Greek cross. At Famagusta the remains of churches were numerous. The mosque, originally the cathedral, dedicated to St. Sophia, was well preserved, although considerably injured by the Venetian bombardment. Its length is 170 ft., and the total width 75 ft. The height of the nave was about 75 ft., and of the aisles about 40 ft. There were many remains of other fine churches in Famagusta, but this was the best preserved. There were said to be twenty churches of which remains existed, and in some of them remains of frescoes were to be seen. The Abbey of Bella Pais stands upon the side of a mountain in a most beautiful situation. The church has the plan of a Greek cross: Mr. I'Anson considered it to be pre-Mediæval in date. Three sides of the cloister still remain, although a good deal injured. On the north of the church is a noble hall, 100 ft. long, 32 ft. wide, and 40 ft. high, with a large rose-window at the west end. This was assumed to be the refectory. On the north wall is a pulpit reached by steps in the thickness of the wall. In conclusion, Mr. I'Anson briefly referred to the domestic architecture of Cyrrus.*

* For details of this part of his subject, see Mr. I'Anson's letter, accompanied by illustrations, in the last volume of the *Builder*,—xlii., pp. 449, 454.

In the discussion which followed,

Mr. J. T. Wood said he was in Cyprus in 1878, when he visited the island for the purpose of reporting to the trustees of the British Museum whether it would be desirable to continue the excavations commenced by Cesnola. Unfortunately, he had seen very little of the architecture of the island, for he was only there a month, and was ill half the time. With regard to the number of ruined churches in Famagusta, he had not been able to count so many as twenty'; he only saw twelve, including the cathedral. Four of them had perfect stone roofs. The cathedral at Famagusta was full of grace and beauty, with regard both to proportion and detail. While there he found on the side of the cathedral an inscription which showed the date of the building: he thought it was 1329. Gothic architecture, as it was practised in Cyprus, was full of peculiar beauties, and it was well worthy of further study. In one church he saw a painting containing at least twenty figures which had escaped obliteration by the Turks. The rock-cut tombs at Paphos were very interesting.

Mr. William White, in proposing a vote of thanks to Mr. I'Anson for his paper, said it did not appear that Cyprus possessed any indigenous architecture. Mr. I'Anson had spoken of the cathedral at Nicosia having an eastern door, which was a remarkable thing, and quite unknown, as far as he (the speaker) was aware, in Mediæval architecture. Mr. I'Anson had said that this eastern doorway was subsequent to the building itself; but could he say how long subsequent, and whether its insertion had led to any modifications of the arrangements of the choir or sanctuary?

Sir Ralph Thompson, K.C.B., said he had travelled all over the island of Cyprus, and was familiar with the buildings described by Mr. I'Anson. He was not an architect, and did not pretend to much knowledge of architecture, but what struck him as being particularly interesting was the feudal or military architecture of the island. There was a very fine castle remaining near the Abbey of Bella Pais. Cyprus being, indeed, a home of the feudal system, it was probable that further investigations into the architectural remains of the island would reveal interesting particulars as to castles and buildings of that class.

Mr. John Hebb observed that shortly after the island of Cyprus passed under the administration of the English, it was proposed to restore the church of St. Nicholas at Nicosia and to convert it into a church for the English residents. He should like to know whether that proposal was likely to be acted upon, because if the churches of Nicosia and Famagusta were to be restored, there would soon be an end of all that was interesting in them. They would suffer more at the hands of the restorer than at the hands of the Turks.

Mr. R. Phené Spiers regretted that Mr. Vacher was not present, and suggested that as that gentleman was very familiar with the cathedral at Famagusta, having studied, measured, and drawn it on the spot, he should be asked to be good enough to furnish some particulars of it as an *addendum* to Mr. I'Anson's paper.

Professor T. Roger Smith, in seconding the vote of thanks, asked whether Mr. I'Anson could give some further particulars of the covering-in of the churches which he had described as vaulted, although without any additional external roof. How were the upper surfaces of the vaulting made to serve as a roof? Were the haunches filled in?

Mr. Ewan Christian, in supporting the motion, referred to Mr. I'Anson's paper and the interesting sketches by which it was illustrated as constituting a most remarkable specimen of good holiday work.

The Chairman, in putting the motion, said there was another island, somewhat similarly placed to Cyprus,—*i. e.* contiguous to a mainland of historic fame, and which had been occupied by the Greeks and Romans, by the Venetians, and by Templars. He alluded to Sicily, which in three or four circumstances was analogous to Cyprus. Sicily was, of course, very much richer in Grecian remains, while of specimens of Mediæval architecture there was a remarkable number of very fine buildings, no doubt the works of the Templars and Crusaders, with probably some works of the earlier Normans.

The vote of thanks having been carried,

Mr. I'Anson acknowledged the compliment, and in reply to the questions raised said he did not know how the haunches of the vaulted roofs of the churches were filled in. Probably the upper surfaces of the vaulting were covered with mud and chopped straw, beaten carefully down, in the same way as the roofs of the houses were covered, with some slight arrangement of ridges and furrows to readily carry off the rain, of which there was not much in the island. With regard to Mr. White's question, the interior arrangements of the church had been very little altered at all, although used by the Turks as a mosque. The eastern door which had been mentioned was more modern than the building itself, although the details were just as good and characteristic as those of the other parts of the building. Whether, however, the door had been inserted in French times or subsequently thereto he could not tell. With regard to Mr. Hebb's question, he had been informed by Mr. Charles Barry that a former pupil of his had been commissioned to restore the church in question. Although the church was a good deal shattered in many parts, he (Mr. I'Anson) thought that any careful man could satisfactorily restore it, for there was so much old work left by way of precedent.

The meeting then terminated.

THE COLOSSAL STATUE OF GERMANIA.

The great national statue of Germania, which is to be erected at Niederwald, near the Rhine, to commemorate the victory of Germany in the last Franco-German war, is now in process of being cast in separate pieces at Munich. The head and several other parts have already been completed. Some idea of the magnitude of this work may be gathered from the fact that the total weight of metal in it will amount to not less than forty-five tons. In the work of casting and finishing as many as fifty men are often being employed at one time. The gigantic head of the statue is already finished, and so is the powerful left arm with hand, on the tip of one of the fingers of which rests the Imperial crown of Germany. Last week the workmen were engaged on finishing the right arm and hand grasping the handle of the sword. Other men were at work on the huge shoulder and breastplate, on which is the Imperial eagle. The largest single portion of the statue, — the throne with cloak lying on it, the whole weighing fifteen tons,—has just been cast. The blade of the sword, which alone weighs a ton, and which, enveloped in an oak garland, has been cast separate, is also finished. Part of the chain armour, with its free-lying texture of rings, is likewise ready, and is a beautiful piece of workmanship. The other parts of the monument are being cast at different establishments in other cities. Thus, the figures of the Rhine and the Moselle, to be placed at the foot of the pedestal,—the latter is itself 80 ft. in height,—are being executed at Dresden; the relievos are being prepared in Berlin, the great Imperial eagle at Lauschhammer, and the allegorical figures of War and Peace at Nuremberg.

RECENT PERGAMIC DISCOVERIES.

The *National Zeitung* of Berlin records the addition to the existing Pergamic relics of various objects of interest, amongst them a figure of Athene, of which unfortunately the head, neck, and arms are wanting. The drapery of the remaining portion of the figure, and the scaled armour on the breast with the Gorgon-mask, are said, however, to produce an imposing effect. At the base of the statue are distinct traces of a frieze in relief work.

A second figure, on a diminished scale, is also intended to represent Athene, and is in such a good state of preservation, that the artistic perfection of the work can be easily recognised. The countenance of the goddess wears an expression of severity, though the general character of the impersonation is youthful. With the exception of the right arm and the fingers of the left hand, the work is untouched by the ravages of time. The arrangement of the drapery is free and unconstrained. The figure has been chiselled out of a fine-grained, delicate yellow-toned marble, described as resembling the Pantelian description.

The third draped statue is deficient as to the head and arms, but it is supposed to be a figure of Ceres. All the three statues referred to were discovered in the Sanctuary of Athene. A pillar in a good state of preservation, with a capital which bears in its style some resemblance to Indian ornamentation, is amongst the other objects recently discovered.

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THE HERMES OF PRAXITELES.

HERR FRITZ SCHAPER, the German sculptor and member of the Berlin Academy of Arts, who is best known for his statues of Prince Bismarck in Cologne, of Göthe in Berlin, and of Gauss in Brunswick, has just completed his ideal restoration of the Hermes of Praxiteles. The manner in which he has acquitted himself of this delicate task is spoken of by Berlin critics in the highest terms. Those parts of the ancient statue, the hands, lower portions of legs and feet, and parts of the infant Dionysus, which were not found when the statue was discovered at Olympia, have been supplied by Herr Schaper in masterly style. The work of Praxiteles, as now restored, is at present on view in a room at the Berlin Academy.

THE DURABILITY OF BRICKS.

A REPORT on the general question of the properties which glazed bricks should possess was lately issued by the Hanover Architects' Society,* and touching as it does upon many points more distinctly affecting the manufacture of such bricks than their use in building, it is not surprising that the subject has been taken up in a practical manner by a leading organ of the German plastic industry.

In a somewhat elaborate treatise on the question in the *Thonindustrie Zeitung*, Herr Rühne disputes the assumption that no progress had been made in this class of work until the fourteenth century, and brings forward many interesting facts to prove the diversity of the processes now in use in the manufacture of glazed bricks, also elucidating from the point of view of the brick manufacturer some of the questions raised as to the most suitable and economical method of applying the glaze.

He brings forward some arguments of weight in order to disprove the theory that the work of the Middle Ages in this particular branch was more free from crazing, and consequently more durable, than the productions of our own times. He is quite ready to admit that such specimens as have been preserved are models of careful workmanship, but asks whether any positive proof exists that all the work contemporaneous with that which has come down to our day, was equally perfect.

In his remarks on the subject, Herr Rühne goes further than the Hanover architects' Society, and discusses at some length the question as to what are the influences which a brick is expected to withstand during a long series of years, or even during the lapse of centuries. He records the fact that weather usually affects bricks in consequence of the changes of temperature which occur, and the formation of ice which is thus induced; as also by the influences of rain-water and of gases which may habitually or accidentally be found in the atmosphere. These attacks are thus of a chemical as well as of a physical nature. The chemical influences are such as are connected with decomposition through the action of carbonic acid and other gases in the atmosphere, and by the dissolving or removal of particles of stone by rain-water. The crystalline salts which sometimes appear upon the surface are, it is remarked, mostly produced under circumstances which are injurious to the durability of the material on account of the increase of volume which takes place. The danger is all the more real because, at the next fall of rain, these crystals return into the material in a state of solution, and when dry again become crystallised, thereby producing a splintering effect. Although scarcely noticeable in the first instance, yet the continued repitition of the process which is induced by every shower of rain constitutes a destructive agency which, according to Herr Rühne's theory, is capable of causing the decomposition of a brick when a sufficient quantity of these salts are present in it.

The effects of frost, though of a similar tendency, are, he remarks, more of a mechanical character, as the extension of the volume of water through freezing operates towards the destruction of the brick. In spring and autumn the extension and contraction of bulk, caused by the wide range of temperature comprised in the daily thermometric variations, are specially calculated to affect the portion of the brick nearest the surface. These various influences of a more or less destructive character are rendered specially effective by any irregularity in the resisting properties of the substance of the brick, which should be homogeneous and free from stones, lime, or similar foreign substances. Homogeneousness further implies an equal tension throughout the brick. In machine-made bricks it is remarked that it is by no means unusual to find on the outer surface a layer of finer grained material than in the other portions. In fact, it is urged that for purposes of a monumental character machine-made bricks should not be used, more particularly as glazed bricks. Hand-made bricks, it is considered, should be moulded and heated in general with due observance of special measures of precaution when durability for a period of several centuries is expected from them.

When frost sets in, such congelation as may exist within a brick that is glazed, is by that fact prevented from following out its natural course of extension in the only direction in which it is not closed in. Thus, it is argued that a glazed brick is exposed to a more severe test than an unglazed one, with the result of the forcible destruction of the glaze in some instances. The inference is drawn from this fact that the position of glazed bricks in a building has a certain influence upon their durability, and various facts are quoted with a view of proving that too much must not be expected from them.

In conclusion, Herr Rühne draws from the foregoing explanations the following theoretical and practical inferences:—

1. Weatherproof bricks must not contain any soluble salts; and their formation, as well as their baking, must be carried out so as to ensure this result.

2. They must resist the attacks of carbonic acid in a fluid state. Their porosity must not be too great, and the disposition of the pores must be uniform, the brick being thus rendered homogeneous. The porosity of glazed bricks must in particular be as small as practicable.

3. The baking must be of such a thorough nature as to resist the extension which may result from congelation. The substance of the brick must be as tough as possible, and not brittle or glassy in its character.

4. The co-efficient of extension must be low, in order that a change of temperature may have as little influence as possible on the interior of the brick.

* See *Builder*, p. 519, *ante*.

NEW AGRICULTURAL HALL AT NORWICH.

THIS building was opened by H.R.H. the Prince of Wales on the 16th inst. The building has its principal façade fronting Bank-plain. It is described as being in the pure Italian style, carried out in red moulded Cossey bricks, and red sandstone from St. Bees, Cumberland, with a richly-sculptured pediment, surmounted with a base for statuary, and the keystones of the ground-floor windows carved,—the first specimen of Italian architecture in red stone in this part of the kingdom; as although the same description of stone was introduced by the architect (Mr. J. B. Pearce, of Norwich) in the new Town-hall at Yarmouth, that building is of "Queen Anne" character. The space covered by the building is 175 ft. by 103 ft. Besides the great central hall, there are spacious galleries, a theatre and concert-room capable of seating 900 people, a board-room and offices. dining and market rooms, kitchen, lavatories, &c.; these latter being obtained by utilising the difference between the ground-level at the two sides. The main entrance is in the centre of the front, beneath a portico of wrought-iron and glass, carried on iron girders springing from the wall. Beyond the turnstiles fixed in the vestibule, there are large upper doors leading into the main building. On the left is a wide passage with a staircase to the concert-room, the ladies' cloak-room, and a buffet with lift from the kitchen; on the right, a secretary's office and a board-room. The galleries are on both sides and at the end of the hall, the former 18 ft. and the latter 24 ft. in width. They are approached from the ground-floor by three staircases, and are well adapted for displaying agricultural produce and machinery. All the central portion of the building, which is primarily intended for cattle-stallage, is paved with wood blocks, and the sides with Staffordshire bricks, so that these are easily convertible into temporary stables, or may be used for any purpose in which efficient draining is an element of some importance. Indeed, the internal arrangements are so designed that the hall will be available for such entertainments as circuses, horse shows, horticultural exhibitions, bicycle and pedestrian races, &c. The interior walls are of buff brick, with red and black coloured bands. Springing from the gallery level and supporting the roof are some handsome circular girders, the span of the centre girder being 61 ft. The roof has a lantern top with skylights, and its supports are ornamented with some fine scroll-work. Over the galleries, which are supported on lofty, foliated columns, there are also skylights. The concert-room occupies the whole front of the first-floor, and is 100 ft. in length by 48 ft. in width; it is fitted with a stage at one end, and is well lighted by windows and lunettes.

The architect, as already mentioned, was Mr. J. B. Pearce, of Surrey-street, Norwich, and the contractors were Messrs. J. W. Lacey & Co. About a million and a quarter of bricks have been used in the building, and these have all been supplied by Mr. Charles Cunnel, from his works at Catton. The contractors for the iron roof were Messrs. Butler, of Leeds, and for the ornamental ironwork required in the building. Messrs. Barnards, Bishop, & Barnards, who subcontracted with Messrs. Lacey. The slates were supplied by Messrs. Ashton & Green, of London; and the stone-carving has been executed by Mr. Allan, of St. Giles's-road. The hall is heated with hot-water apparatus supplied by Messrs. Barnards & Bishop, and is lighted both with gas and electricity.

THE EXCAVATIONS AT THE FORUM.

THE excavations at and near the site of the Forum in Rome are now being energetically carried on. In the course of the works foundations of a massive character have been discovered, which belonged, it is supposed, to the Palace of Caligula, and a number of private houses have also been traced, which bounded one side of the Forum. Negotiations are now in progress for excavations in the vicinity of the church of Santa Maria Liberatrice, which covers the site of the ancient temple of Vesta.

The project for the systematic carrying out of excavations at the site of the Forum is receiving the earnest attention of the Italian Government. The municipality has suggested the throwing of an iron bridge over the site of the Forum when its entire excavation has been accomplished. This proposal will, doubtless, meet with energetic opposition from lovers of the relics of antiquity.

Proposed New Street to the Angel.—At the last meeting of the Clerkenwell Vestry, Mr. Churchwarden Goodé in the chair, Mr. Abrahams moved:—

"That the Metropolitan Board of Works having decided to seek Parliamentary powers to form a new road, from near the Holborn Town-hall to the Angel, this Vestry would respectfully submit that of the three ways thereto indicated by their recent surveys in this parish, it is most advisable to take the short, direct, and nearly level route, viz., behind Baynes-row to the Fire-engine Station, thence across the north-west corner of Exmouth-street, through John-street, across Tysoe-street and Rosoman-street, past the Catholic Chapel, towards the drinking-fountain in the New River wall, thus, at no increased cost, avoiding all the unequal and sharp gradients by way of Exmouth-street and Garnault-place, and above all relieving instead of increasing the constant danger that is incurred by the meeting of the large and increasing traffic from the nine or ten thoroughfares that are concentrated at the junction near the Vestry Hall; that the matter be referred to the Works Committee; and that a copy of the resolution be forwarded to the Metropolitan Board of Works."

He said that the route he proposed for the new street would not cost more than taking down one side of Exmouth-street so as to widen that thoroughfare; that the line would be somewhat shorter to the top of Garnault-place, and more direct; that, while better property could not be erected, if one side of Exmouth-street was pulled down, the property along the line now proposed would be enhanced in value, while the business in Exmouth-street would be improved by the removal of some of the heavy traffic from it, and the gradients of the new street would be much better than those of Exmouth-street. The motion was carried unanimously.

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BRITISH ARCHÆOLOGICAL ASSOCIATION.

THE first meeting of the Session 1882-1883 was held on the 15th inst., Mr. Thos. Morgan, F.S.A., in the chair. It was announced that the autumn congress would be held at Dover. The memorial in favour of the preservation of the ancient Tol-house at Great Yarmouth has been presented, and the Town Council have resolved to preserve the building. It is about to pass into the hands of trustees, and to be devoted to some local use. The quaint Rectory-house of St. Paul's, Deptford, a building of triangular plan, the work of Sir John Vanbrugh, is about to be demolished, the site having been sold for building purposes. Mr. Loftus Brock, F.S.A., described a portion of the Roman wall of London, now being removed, at Finsbury-place. It is 9 ft. 2 in. thick, of similar construction to what has been already noticed of the wall elsewhere. Mr. W. G. Smith exhibited several prehistoric stone implements, including a celt of dolorite found at Bedford. Mr. Walter Myers, F.S.A., produced a fine collection of Egyptian antiquities of very early date, and a series of flint arrow-heads from Chinsi and Peratyia. Several fragments of fictile vessels, of Egyptian manufacture, were inscribed with receipts for the delivery of wine to the garrison of Thebes. Mr. Flinders Petrie referred to the frequency of similar inscriptions on ancient Egyptian sites, although but little attention has hitherto been bestowed upon them.

The first paper was by Mr. C. H. Compton, on the archæological features of the recent Exhibition of the Horners' Company, an exhibition which was visited by 7,000 persons during the four days that it was open. There were a large number of pre-historic objects mainly recovered from London, exhibited by Mr. H. Syer Cuming, F.S.A., Scot., and others. Among the objects placed upon the table were two or three examples of the Jewish Shofar, or horn, used in synagogues on the day of the New Year, including that from the synagogue in Bevis Marks. These were so similar in form to the horn found in the Thames, now in Mr. Cuming's collection, as to render it all but certain that the latter is a relic of the presence of the Jews in England in Mediæval times, prior to their expulsion. It was recognised as a Shofar both by Mr. Alf. A. Newman and by Mr. Adler, who described its use. Its form has not been changed since the destruction of the Temple of Jerusalem.

The second paper was by Mr. Roach Smith, F.S.A., on the discovery of a hoard of bronze armlets grouped around a single lance-head, in what was, probably, an ancient cemetery at Brading, I.W.

THE PROPOSED MUSEUM IN OLYMPIA.

DURING six years the German Government, as our readers know, have devoted much money for excavations in Olympia (between Patras and Pyrgos). Professor Curtius and the Architect Adler, in Berlin, had the direction of the works, and published the antiquities found. During some years the question was ventilated whether the antiquities unearthed should be transported to Athens, or if it would be better to build a museum in Olympia. A rich Greek, named Syngros, has given 200,000 francs for the erection of this building, and the Ministry of Cultus is charged with the execution of the project. Architect Adler prepared a plan for the museum, but it did not agree in style with the antiquities found, and would cost from 2,000,000 to 3,000,000 francs. For these and other reasons it was not found desirable to carry out his design. In May last Professor Ziller was charged by the Minister of Cultus to go to Olympia, to see the collection of antiquities, to select a convenient site, and to prepare a design for the museum. This he did, the ground selected being opposite the excavations on the street from Pyrgos. The plan has been approved by the Committee for the Conservation of Antiquities, and it is hoped that in a short time the Museum of Olympia will be built.

We give a sketch and plan of the proposed design.

Professor Ziller is already known to our readers, in connexion with Dr. Schliemann's palatial residence in Athens and the Academy of science in the same historic city.*

* We are indebted to Professor Ziller for the materials of our illustrations, forwarded through Mr. James Hill, of Upper Thames-street.

SKETCH IN ROUEN: CHURCH OF ST. LAURENT.

THE Cathedral, St. Ouen, and St. Maclou, Rouen, are pretty well known to all travellers, but the church, with its interesting tower of St. Laurent, most of which dates from the fifteenth century, standing in the Rue de l'Hôtel de Ville, is not so well known, and is often overlooked by the hurried visitor; but it will well repay a visit. The church is desecrated and abandoned to ignominious uses, and is but the wreck of its former self, but the tower still rears its head, shorn, indeed, of its tiara crown, but beautiful still in its bold open tracery and pinnacle work; airy, yet strong in its construction, and full of a subtle play of light and shade.

ANDREW T. TAYLOR.

CHURCH OF THE HOLY TRINITY, PRIVETT, HANTS.

THIS church, entirely built by the munificence of Mr. William Nicholson, of Basing Park, M.P. for Petersfield, stands prettily in the rural parish of Privett, and close to Basing Park. The church, which, as the view shows, is Early English in style, is built of flint with dressings of Doulting stone.

Internally, it is faced with ashlar of Ham Hill stone, and has a dado of Corsehill stone running round the church. The rest of the internal stonework is Corsham Down Bath stone. All the polished columns are of Purbeck marble. The roofs are of pitch pine, and covered externally with Broseley tiles. The floor is laid throughout with marble mosaic by Burke & Co., except that under the seats, which is of pitch pine block paving. The chancel seats and other fittings are of oak, the nave seats of pitch pine.

There is a fine organ by Lewis, and a peal of eight bells by Messrs. Mears & Stainbank.

In plan the church consists of nave, aisles, and chancel, with north and south transeptal chapels, in the north of which are placed the organ and vestry.

A tower with a lofty spire stands centrally at the west end.

The east window and some of the other windows in the church are filled with stained glass by Messrs. Heaton, Butler, & Bayne.

The lectern, which is of wrought iron, and the rest of the metal work in the church, was executed by Messrs. Hart, Son, & Peard. A view of the lectern we give separately.

The contractors were Messrs. Dove Bros., and the architect was Mr. Blomfield.

LECTERN: HOLY TRINITY, PRIVETT.

THIS lectern, of which we publish an illustration, is (with the exception of the base and book-rest) entirely of *forged* charcoal iron, the foliated ends of scroll, leaves, &c., being beaten into their various forms after being forged, and when cold. The circular parts of the shafts are turned in the lathe, and the crocketed terminations of the buttress-stay are slightly trimmed up, but nearly all the other parts are used as they came from the anvil. The moulded base is of cast iron, and the book-rest of brass, in two plates, with a moulded edging between them, to avoid the unsatisfactory appearance of a single thickness plate. The work is painted a greyish-black, and relieved by the careful etching of some of the parts and the entire gilding of others, and is a very creditable specimen of modern art workmanship.

The design was prepared by the architect of the church, Mr. A. W. Blomfield, M.A., and carried out by Messrs. Hart, Son, Peard, & Co.

The Standard Theatre offered for Sale.—At the Mart, Tokenhouse-yard, on the 16th inst., Messrs. Farebrother & Co. offered for sale by public auction, by order of the Court of Chancery, the National Standard Theatre, Shoreditch, together with the Bishopsgate Hall adjoining, described as being licensed for music. Six houses in High-street and Holywell-lane, adjoining, were also included, the whole property covering an area of 17,000 superficial feet. The biddings commenced at 10,000*l.*, and advanced by 1,000*l.* at a time to 40,000*l.*, at which sum the property was withdrawn, the auctioneer stating that it was less than the value of the land alone.

THE PARIS SCHOOL OF PHARMACY.

WHEN, two years since, the Architectural Congress which met in Paris visited, as we reported in these pages, the new buildings of the École Supérieure de Pharmacie, the works, though well advanced, were still far from completion. Rapid progress has, however, of late been made, and we are now able to present a view of the new institution. For a long time past the old École de Pharmacie, situated in the Rue de l'Arbalête, the creation only of the last century, has been unable to accommodate the increasing number of pupils who avail themselves of the gratuitous courses of lectures afforded by the school. The École de Pharmacie is one of the many admirable educational establishments of Paris which have long helped to give its character to the Quartier Latin,—the students' quarter, *par excellence*, in the city of pleasure by the banks of the Seine.

Built on a plot of ground cut off some years since from the Luxembourg Gardens, what English reader who has not even seen Paris does not recall Thackeray's delightful picture of the spot? The new school will provide ample accommodation for many a generation to come of rising chemists, for the preparation of whom the École is specially endowed by the Government. Commenced in 1877, the new buildings lie between the Rue l'Abbé de l'Epée on the north, the Rue Michelet on the south, on the west the Rue d'Assas, and on the east the superb Avenue de l'Observatoire, towards which are turned the principal façade and the entrance courtyard. The buildings consist of three blocks, parallel with the avenue, together with two wings. Two large amphitheatres, each able to contain 600 pupils, are connected with the main building by vestibules and galleries. On the north lie a series of laboratories intended for chemical and micrographic research.

The principal buildings comprise, on the ground-floor, the *salle des actes*, or examination-hall; the secretary's offices, and the laboratories of the professors of botany, cryptogamy, mineralogy, toxicology, chemical and galenic pharmacy, &c. On the first floor lie the collections of zoology, physics, botany, mineralogy, the library, and reading-rooms. In the annexes contiguous to the northern wing reside the principal officials; while there is also a further series of laboratories.

A large botanical garden, occupying the remainder of the ground, stretches behind the buildings between the Rues Michelet and d'Assas, at the corner of which lies the gardener's lodge. The garden is supplied, it may be stated, with ample hot-house accommodation.

The building rests on a foundation formed of 700 wells filled with concrete, the greater part reposing on pillars of rubblework reaching 20 yards down to the level of the so-called "catacombs," or worked-out quarries, which undermine almost the whole southern portion of the French metropolis.

On the side turned towards the Avenue de l'Observatoire, in the principal court-yard,—which is decorated with a series of well laid-out beds, and surrounded on three of its sides by a graceful portico,—are placed the statues of Vauquelin, the great chemist, and Parmentier, the introducer of the potato into France.

Above the portico, under the large windows of the first floor, are let into the walls a line of medallions (in white marble) of the *savants* who by their research have extended the domain of pharmacy and chemistry. These medallions, executed under the direction of the Minister of the Fine Arts, are the work of various artists. Among the portraits may be mentioned those of Pélouze, Balard, Caventon, Pelletier, Davy, Dumenil, Jussieu, Seba, Schelle, Bayen, Rouelle, Geoffray, Charras, Leméry, Boulduc, Macquer, Baumé, Lavoisier, Berthollot, Schammerdan, Chaptal, Thenard, Serullas, Valenciennes, Gibourt, Langier, Gerardt, Houël (the founder of the École), and Fourcroy, one of its first directors.

As our readers can judge from the view we present, the building is in the simplest style, and essentially of a utilitarian character, a feature we remember the architect, M. Charles Laisné,—one of the Government architects,—impressing on the members of the Congress who, as we have stated, visited the buildings two years since, as the result of the small sum placed at his disposal to carry out his plans.

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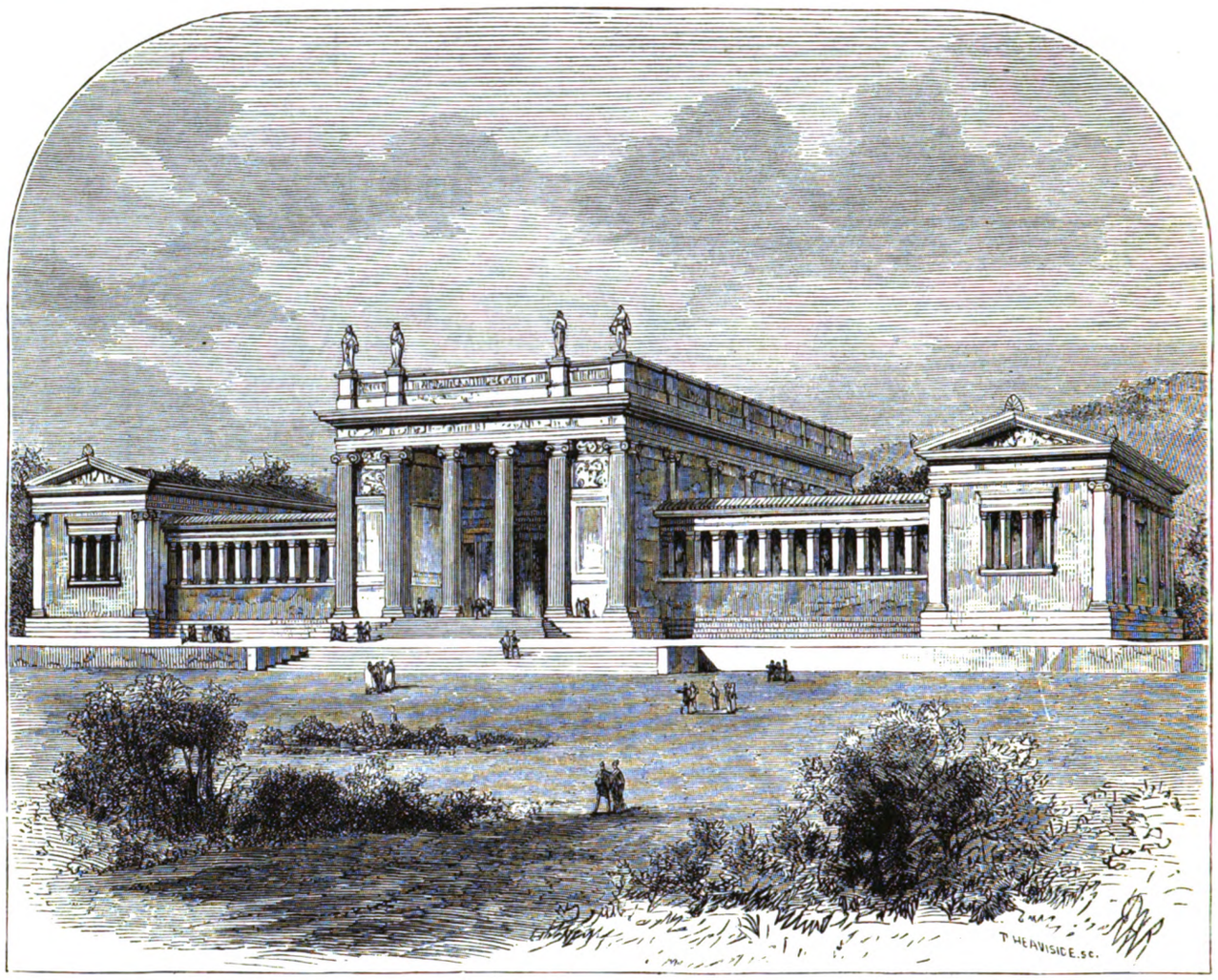
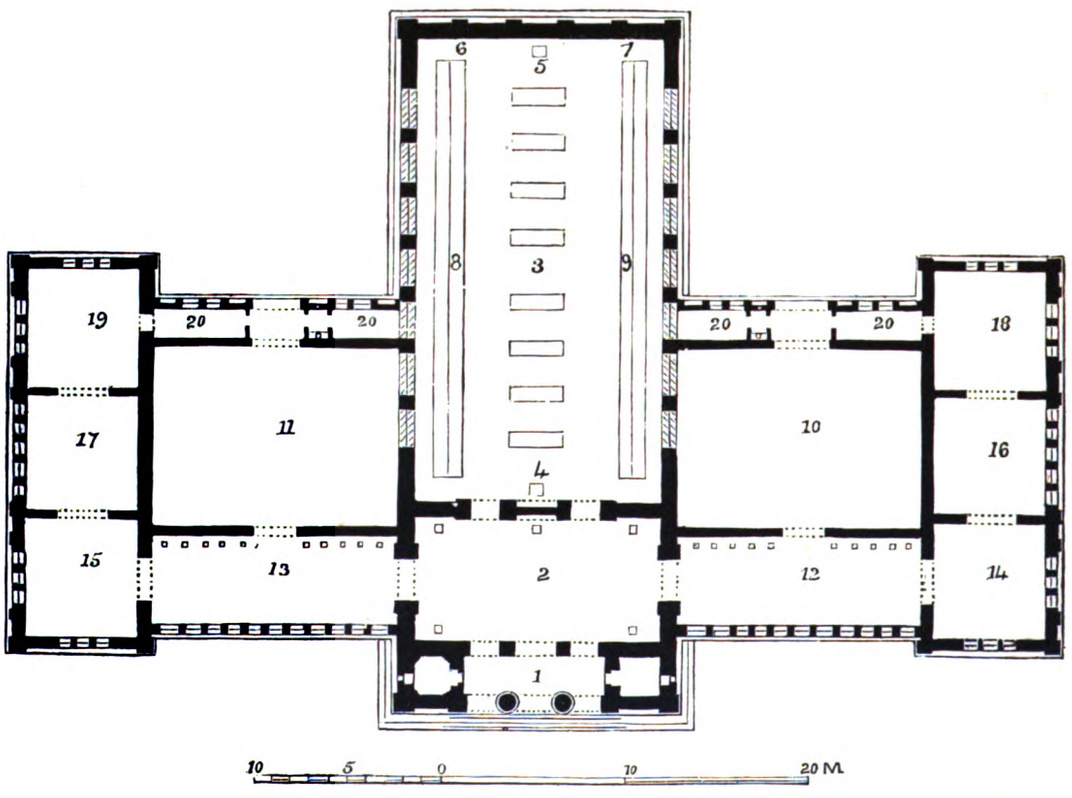


PROPOSED MUSEUM AT OLYMPIA.—PROFESSOR ZILLER, ARCHITECT.



1. Stoa.
2. Entrance.
3. To Jove.
4. Nike.
5, Hermes, after Praxiteles.
6, 7. Statues.

8, 9. Statues from the Frontispiece of Temple of Jupiter.
10. Inscriptions.
11. Architectural Antiquities.
12. For Statues.
13. For Statues of Roman Workmanship.
14. Collection of Bronzes.

15. Antiquities in Metal Work.
16. For Terra-cottas.
17. Medals and Coins.
18. Comptoir.
19. Studio.
20. Vestiaries.

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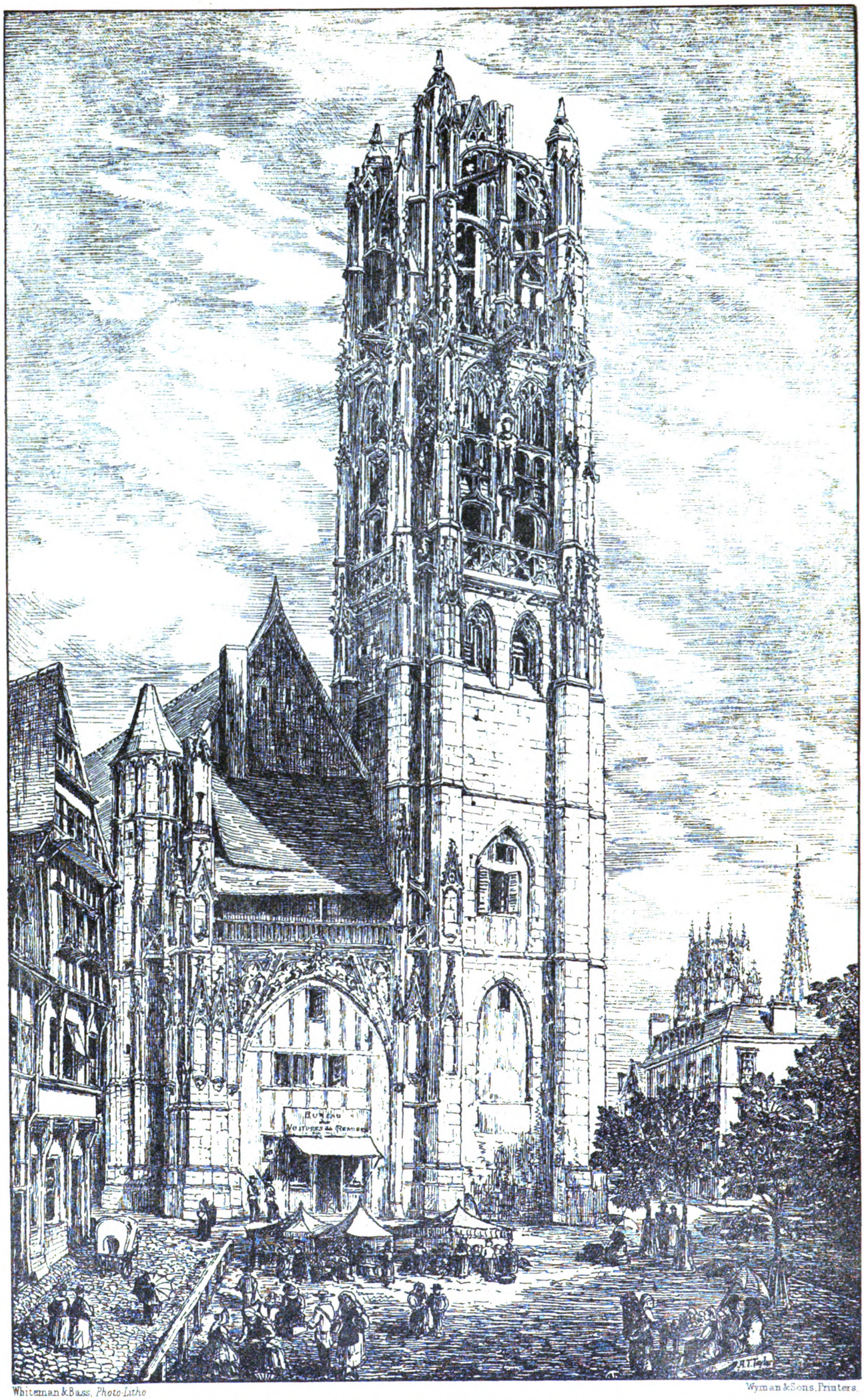

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SKETCH IN ROUEN: CHURCH OF ST. LAURENT.

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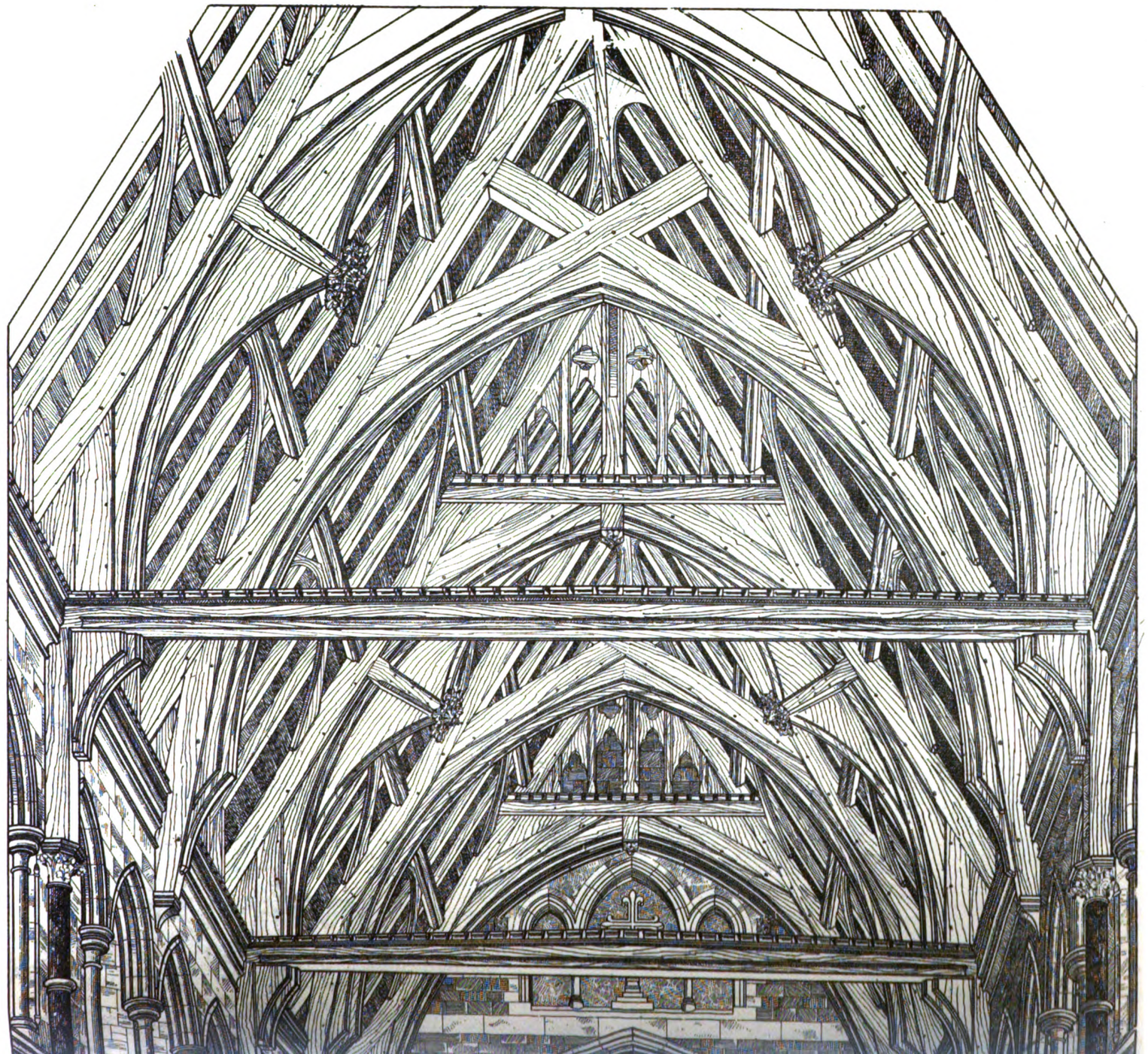

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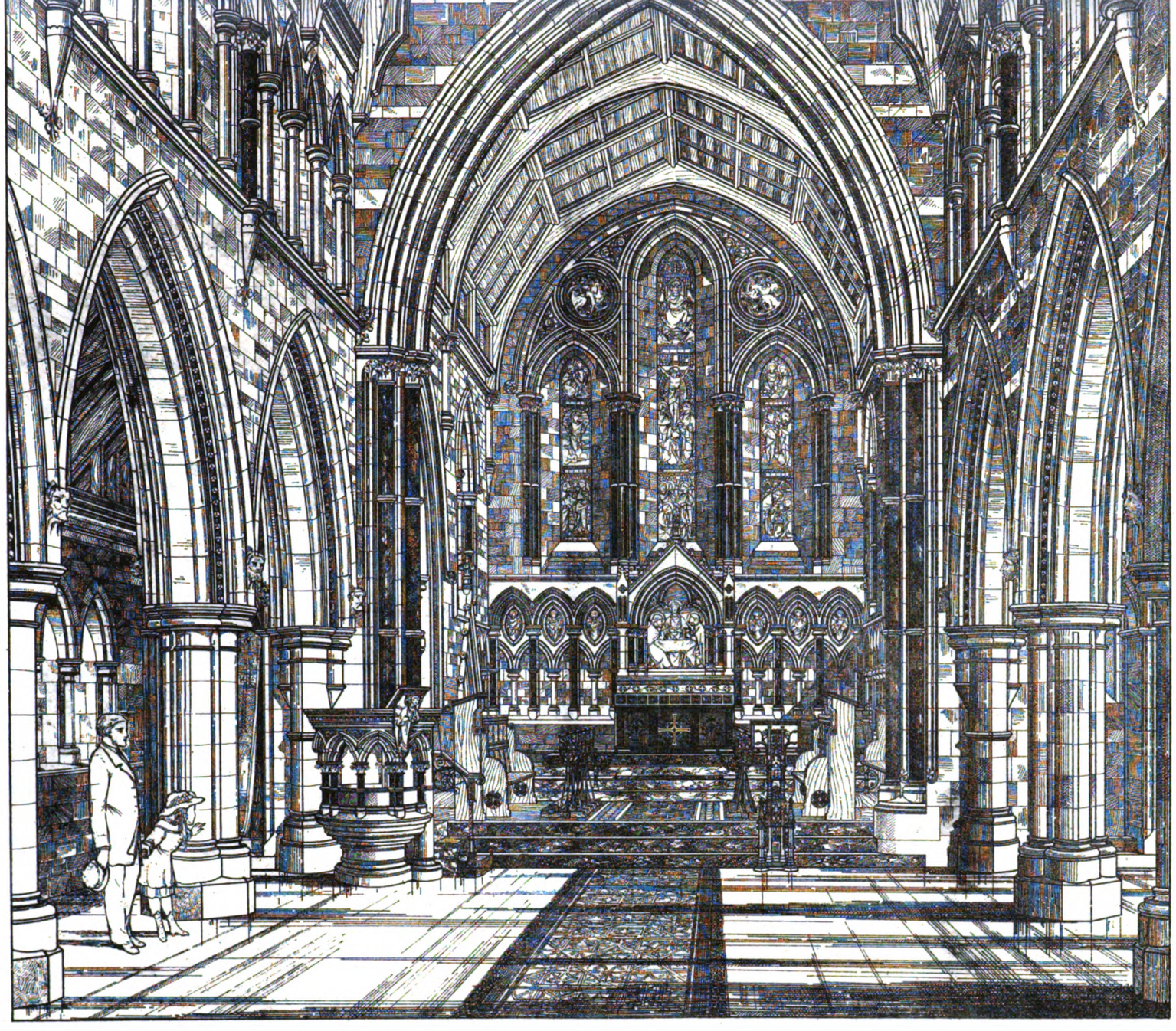

CHURCH OF THE HOLY TRINITY, PRIVETT, HANTS.—Mr. A. W. Blomfield, M.A., Architect.

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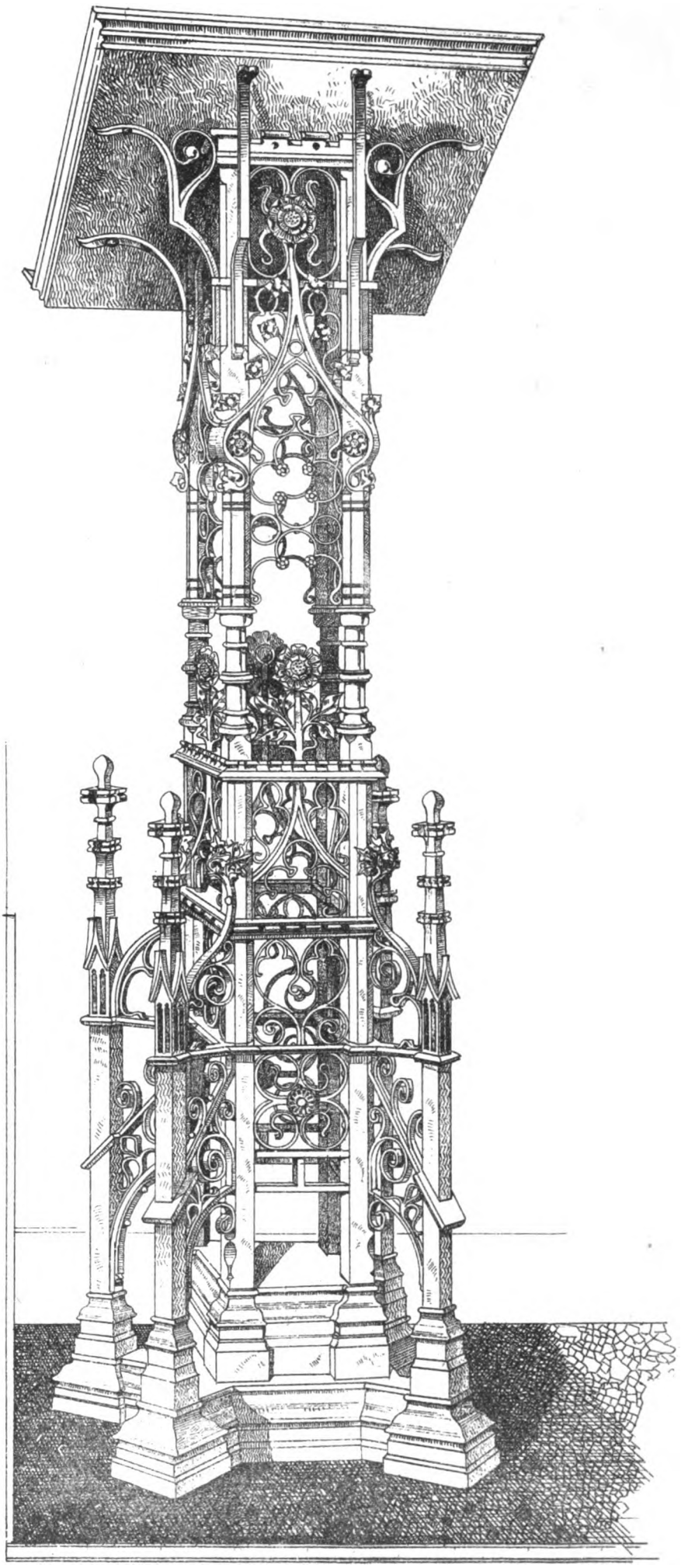

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LECTERN, HOLY TRINITY CHURCH, PRIVETT.

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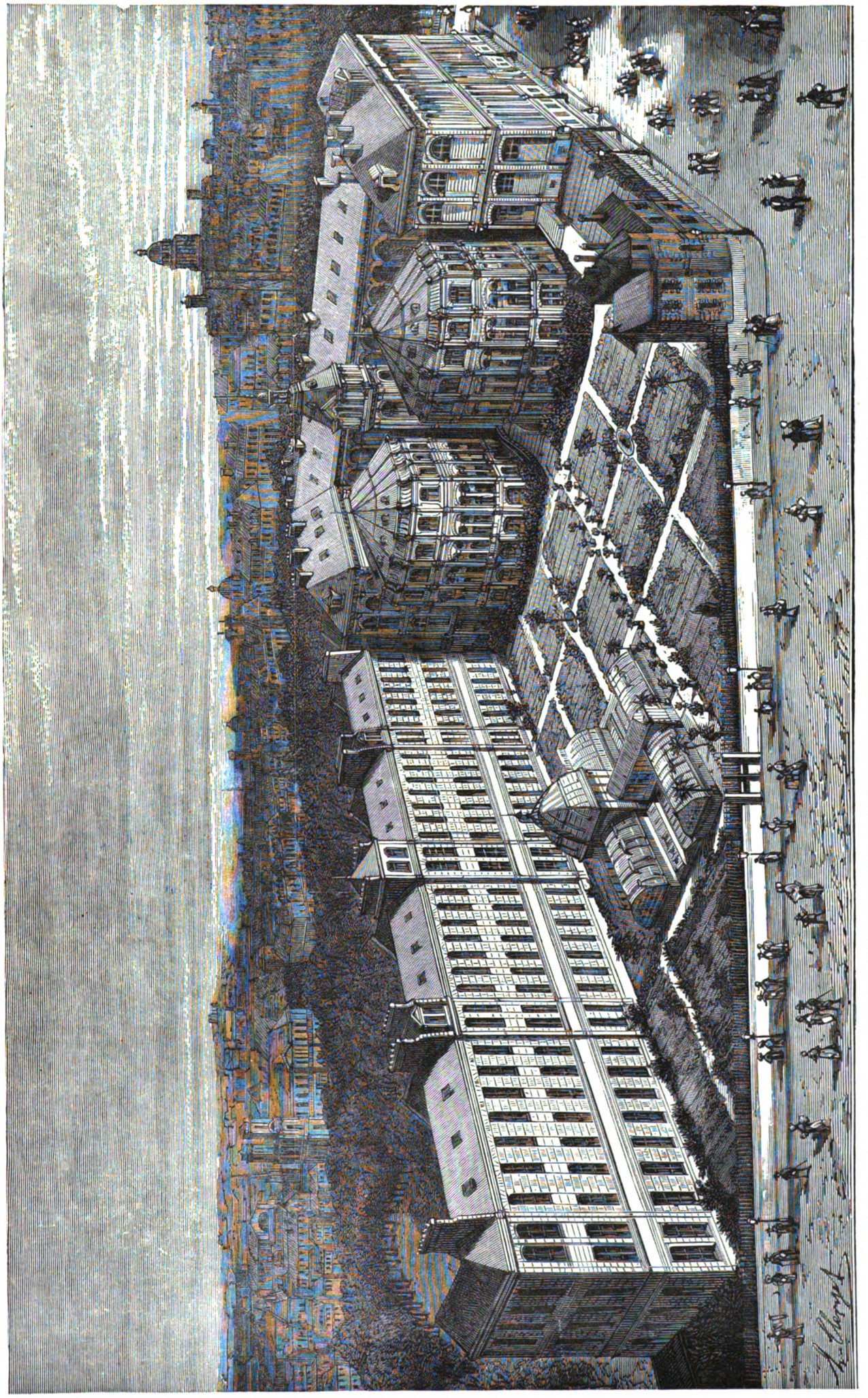

THE HIGH SCHOOL OF PHARMACY, PARIS.—M. Charles Laisné, Architect.

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ADDRESS TO THE LEEDS ARCHITECTURAL SOCIETY.

An address was delivered by the President, Mr. J. B. Fraser, F.R.I.B.A., at the opening meeting of the session.

At the commencement the President expressed regret that he could not refer in more cheerful and hopeful terms to the commercial outlook of the profession. He said,—Notwithstanding the enormous energy developed in the production of merchant shipping, which would appear to point to the increased circulation of wealth in the country, the more than fairly average harvest, and the briskness of many of our staple manufactures, there seems still to be a lack of money for permanent investment and want of buoyancy in the building trades, and as a consequence we find ourselves for the most part by no means so actively engaged as we should like to be. The returns of the Inspector for Buildings in our own town, and of the Building Committee of Bradford, show very plainly and somewhat painfully that although our population is increasing, the demand for house property is, instead of being on the increase, actually declining. In Leeds, during 1879, 1,721 houses were completed and certified for occupation; in 1880, 1,318; and in 1881, 1,012; for the present year, the returns are 1,044.

In Bradford a still more extraordinary diminution is shown, for whereas in 1877 the number of new dwelling-houses certified for occupation was 1,213, whilst for this year we find only 319, or little more than one-fourth. In Leeds, under the heading of miscellaneous buildings, we have not such a discrepancy, as the figures run for the three years,—886, 847, 905, and for the present year 852; at Bradford, curiously enough, under the same heading, we find a considerable increase, which we will try and regard as a hopeful sign for the future, and particularly if we bear in mind the fact that a few years ago, when at the height of the great revival of trade in both districts, the building of houses was considerably overdone, and a number of those built in the Bradford district have never yet been occupied, though I am happy to find, owing to the increase in trade, a decided improvement is apparent.

We give some further passages from the address:—Whilst referring to the work of the younger members, I must take the opportunity to say a few words on a far from pleasant topic, but which must not for that reason be shirked: I mean the undertaking of work by architects' assistants without the consent of their employers. This is a great and, I am afraid, a growing evil; at any rate, during my term of office as your president, I have had several complaints about the practice.

It may seem hard and arbitrary, perhaps, at first sight to endeavour to prevent a young man with possibly a limited salary and many claims on his slender purse, to take advantage of an occasional windfall in the shape of work coming into his way, especially when the work is introduced to him by reason of personal friendship. Where the system pinches most is in the employment of very young and inexperienced men by unscrupulous speculative builders and others, to prepare drawings in such a way as to enable the builder to represent that the design is his own, and to persuade his unfortunate victim that an architect is a useless and costly luxury, and that his services can be dispensed with. I think all must see the great discredit done to our profession by this illicit practising (I know no better term for it); much of the work so carried out is very crude and slipshod, and being hurriedly prepared at night after office hours (a time which ought to be devoted to study), must necessarily be ill considered and imperfect, and even if a show of superintendence is made it is often of the most useless description; and besides, the charges are so ridiculously low as in themselves almost proclaim the work dear at any price. If a young man has a good connexion and is confident of his own powers, by all means let him commence business for himself, and not play a double part. I trust the members of this association will set their faces very strenuously against a continuance of this pernicious practice; to the older members it is a question of the honour and well-being of their profession, and to the younger members especially it is important to put a stop, if possible, to it, as their only chance of success in life is to prepare themselves thoroughly by training for the production of first-class work, and to charge for that work upon the usual scale. In speaking of the late Mr. Burgess, Mr. Ewan Christian coupled him with Lord Beaconsfield as having, like that illustrious statesman, learned the lesson of "how to wait," and, hard as the lesson may be in some cases, it is essential to our mutual well-being that all young architects should learn how to wait until they are justified by their knowledge and experience in undertaking work of a responsible nature, and can command a fair recompense. I think it is a question worthy of consideration whether a written agreement should be made by assistants, on entering into an engagement, that they will not undertake work without first obtaining the consent of their employer; and I have no hesitation in saying positively that such an arrangement should be imperative in the case of assistants in public offices. It will be in your recollection that we addressed a protest to the Institute of British Architects against the official consent of that body being given to the system of double competitions which has recently sprung up. The members of that Institute seem, however, to think that the scheme is of benefit to the profession in certain cases, and have virtually determined to abide by their regulation or suggestion relating to it. I regret that this is so for I cannot see that it will lead to anything except extended labour in the production of two sets of drawings instead of one; and as there may in future almost always be a professional assessor or referee, I think it lays such assessor open to temptation in preferring the particular style of architecture that he affects, as it will be impossible in his first report to prevent his conveying some idea of which of the selected sketches he prefers. Besides, the system seems to give more scope for the unscrupulous to canvas the members of the corporate or other body for whom they are working, and thus bring personal influence to bear. The sketch system alone is quite sufficient, without any second competition, and would, indeed, be a great boon; for if competent referees were consulted, their professional knowledge ought to be sufficient to enable them from plans, one or two sections, and one perspective sketch, all to a fixed scale, to judge of the relative merits of the designs, especially if two or three sheets of working detail in pencil, showing the proposed method of treatment intended, were added to the list above, so as to enable the assessors to guard against the misleading effects of meretricious work in the general drawings. The advocates of the double scheme insist on its advantages to the young and clever members of the profession, as giving them a chance to come to the front; but it appears to me that a young man, unless he had a good capital, would, if he were selected once or twice for the final competition, and then proved unsuccessful, run a risk of bankruptcy on the threshold of his career, as the fees allowed for the final stage would by no means cover the cost of the elaborate finished design.

Another important public question is the housing of the very poorest of our working population. It is high time that legal powers should be granted to enable corporate bodies, or even private companies, to obtain dilapidated untenanted property, not at the ridiculous prices awarded by arbitrations, but at so low a price as to make the erection of new and improved dwellings on the sites thus obtained a remunerative speculation; the great drawback to private enterprise, at any rate, is the excessive cost of the land, and the fact that there is so large a demand for central sites in our business towns for manufacturing purposes. In Leeds the mechanic class is not badly off for suitable dwellings, and at moderate rents. The class of people for whom industrial dwellings, so called, are really wanted, are the poorest of the poor,—those, in fact, who can barely afford a single room, and who at present herd together in a way shocking to contemplate. Of course, in these buildings there is always the difficulty of great height and many steps to contend against, but perhaps the upper stories might be adapted for common lodging-houses, for young and vigorous tramps and navvies, and the lower stories devoted to those whose limbs are not so pliant. Then, again, some of these model dwellings, as they are called, have unnecessarily lofty stories. I think if a room has ample window-space and means of thorough ventilation, a height of 9 ft. would be sufficient, especially when we consider that one of the greatest difficulties of the very poor is procuring sufficient bodily heat, either by food or fuel, and a too lofty room must necessarily be cold. What is required, it appears to me, are rooms about 16 ft. by 14 ft., with recess and screen for parents' bed, a sink-closet shut off from the living-room, and, of course, with the best known appliances for cutting off the waste-pipes from direct communication with the drains, and, in addition, if possible, a small pantry, projected from the face of the outer walls, to secure a through current of air. All should be under constant supervision so as to ensure cleanliness in all the sanitary arrangements. It may be objected that no family should be allowed to live in one room only, and, theoretically, that is all very well; but the fact is,—and we cannot alter it,—that many thousands of our fellow-creatures are so extremely poor, that it is a question with them between one room and the workhouse; and this is the class whose needs ought to be considered.

That large blocks of industrial dwellings are healthy as compared with ordinary low-class houses, is evident from the returns of several of the most important properties of that description; thus the death-rate of the London Improved Industrial Dwellings Company, of which Sir Sidney Waterlow is chairman, only averaged 16·4 per 1,000 during the year 1881, as against 21·2 in London generally. The Peabody "Trust" Buildings, with accommodation for 12,000 persons, show a death-rate of 17·22, and the Metropolitan Association show a death-rate as low as 14·3 only for last year. More striking, however, than either of the three instances just quoted is the case of Newcastle-on-Tyne, where (as we are told by the able manager, Mr. Price), during the past twelve months, the block of buildings belonging to the Newcastle Improved Industrial Dwellings Company, which accommodates an average of 500 persons, only had a death-rate of 12 per 1,000 per annum; the rate for the parish in which the block is situated being for the same period 22·2 per 1,000 per annum.

The blocks of buildings referred to above, however satisfactory in themselves, have not solved the great problem of how to provide healthy dwellings for the poorest class at rents within their means, and therefore if we are to have such comfortable, though humble homes, I fancy that philanthropic aid will have to be called in to a certain extent. Whenever a corporate body finds it necessary to pull down the houses of the very poor, the erection of suitable dwellings, under careful superintendence, should be immediately undertaken, having at least as many rooms or tenements as are removed; and I would further suggest that the corporation, backed by the Poor Law authorities, should build, at any rate, one block as an experiment, as they have almost unlimited borrowing powers, and the absence of any interest above what would be necessary to pay the Loan Commissioners would not be of consequence. There is also a field for very practical and useful benevolence on a large scale for some of our wealthy merchants and manufacturers; if they will find the money, I think there would be no difficulty in getting excellent designs in competition.

THE COST AND CONDUCT OF THE ELECTRIC LIGHT.

Dr. Siemens, in his opening address as Chairman of the Council at the Society of Arts on the 15th, devoted the greater part of it to a consideration of the electric light from an economic point of view. His statements dispelled some popular errors on the subject, and it will be useful to give them increased circulation. The Chairman said,—Complaints appear almost daily in the public papers, to the effect that townships refuse their assent to applications by electric light companies for provisional orders; but it may be surmised that many of these applications are of a more or less speculative character, the object being to secure monopolies for eventual use or sale, under which circumstances the authorities are clearly justified in withholding their assent; and no licences or provisional orders should indeed be granted, I consider, unless the applicants can give assurance of being able and willing to carry out the work within a reasonable time. But there are technical questions involved which are not yet sufficiently well understood to admit of imme-

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diate operations upon a large scale. Attention has been very properly called to the great divergence in the opinions expressed by scientific men regarding the area that each lighting district should comprise, the capital required to light such an area, and the amount of electric tension that should be allowed in the conductors. In the case of gas supply, the works are necessarily situated in the outskirts of the town, on account of the nuisance this manufacture occasions to the immediate neighbourhood; and, therefore, gas supply must range over a large area. It would be possible, no doubt, to deal with electricity on a similar basis, to establish electrical mains in the shape of copper rods of great thickness, with branches diverging from them in all directions; but the question to be considered is, whether such an initiative course is desirable on account either of relative expense or of facility of working. My own opinion, based upon considerable practical experience and thought devoted to the subject, is decidedly adverse to such a plan. In my evidence before the Parliamentary Committee, I limited the desirable area of an electric district in densely-populated towns to a quarter of a square mile, and estimated the cost of the necessary establishment of engines, dynamo-machines, and conductors, at 100,000*l.*, while other witnesses held that areas from one to four square miles could be worked advantageously from one centre, and at a cost not exceeding materially the figure I had given. These discrepancies do not necessarily imply wide differences in the estimated cost of each machine or electric light, inasmuch as such estimates are necessarily based upon various assumptions regarding the number of houses and of public buildings comprised in such a district, and the amount of light to be apportioned to each, but I still maintain my preference for small districts.

By way of illustration, let us take the parish of St. James, near at hand, a district not more densely populated than other equal areas within the metropolis, although comprising, perhaps, a greater number of public buildings. Its population, according to the preliminary report of the census taken on the 4th April, 1881, was 29,865, it contains 3,018 inhabited houses, and its area is 784,000 square yards, or slightly above a quarter of a square mile. To light a comfortable house of moderate dimensions in all its parts, to the exclusion of gas, oil, or candles, would require about 100 incandescence lights (or, if I may suggest a more euphonious expression, glow-lights) of from 15 to 18-candle power each, that being, for instance, the number of Swan lights employed by Sir William Thomson in lighting his house at Glasgow University. Eleven-horse power would be required to excite this number of incandescence lights, and at this rate the parish of St. James's would require 3,018 × 11 = 33,200-horse power to work it. It may be fairly objected, however, that there are many houses in the parish much below the standard here referred to, but, on the other hand, there are 600 of them with shops on the ground-floor, involving larger requirements. Nor does this estimate provide for the large consumption of electric energy that would take place in lighting the eleven churches, eighteen club-houses, nine concert-halls, three theatres, besides numerous hotels, restaurants, and lecture-halls. A theatre of moderate dimensions, such as the Savoy Theatre, has been proved by experience to require 1,200 incandescence lights, representing an expenditure of 133-horse power; and about one-half that power would have to be set aside for each of the other public buildings here mentioned, constituting an aggregate of 2,926-horse power; nor does this general estimate comprise street lighting, and to light the six miles and a half of principal streets of the parish with electric light, would require, per mile, thirty-five arc lights of 350-candle power, each, or a total of 227 lights. This taken at the rate of 0·8-horse power per light, represents a further requirement of 182-horse power, making a total of 3,108-horse power, for purposes independent of house-lighting, being equivalent to 1-horse power per inhabited house, and bringing the total requirements up to 109 lights = 12-horse power per house. I do not, however, agree with those who expect that gas lighting will be entirely superseded, but have, on the contrary, always maintained that the electric light, while possessing great and peculiar advantages for lighting our principal rooms, halls, warehouses, &c., owing to its brilliancy, and more particularly to its non-interference with the healthful condition of the atmosphere, will leave ample room for the development of the former, which is susceptible of great improvement, and is likely to hold its own for the ordinary lighting up of our streets and dwellings. Assuming, therefore, that the bulk of domestic lighting remains to the gas companies, and that the electric light is introduced into private houses only, at the rate of, say twelve incandescence lights per house, the parish of St. James's would have to be provided with electric energy sufficient to work (9 + 12) 3,018 = 63,378 lights = 7,042-horse power effective; this is equal to about one-fourth the total lighting power required, taking into account that the total number of lights that have to be provided for a house are not all used at one and the same time. No allowance is made in this estimate for the transmission of power, which, in course of time, will form a very large application of electric energy; but considering that power will be required mostly in the day-time, when light is not needed, a material increase in plant will not be necessary for that purpose. In order to minimise the length and thickness of the electric conductor, it would be important to establish the source of power, as nearly as may be, in the centre of the parish, and the position that suggests itself to my mind is that of Golden-square. If the unoccupied area of this square, representing 2,500 square yards, was excavated to a depth of 25 ft., and then arched over so as to re-establish the present ground level, a suitable covered space would be provided for the boilers, engines, and dynamo-machines, without causing obstruction or public annoyance; the only erection above the surface would be the chimney, which, if made monumental in form, might be placed in the centre of the square, and be combined with shafts for ventilating the subterranean chamber, care being taken, of course, to avoid smoke by insuring perfect combustion of the fuel used. The cost of such a chamber, of engine-power, and of dynamo-machines, capable of converting that power into electric energy, I estimate at 140,000*l.* To this expense would have to be added that of providing and laying the conductors, together with the switches, current regulators, and arrangements for testing the insulation of the wire. The cost and dimensions of the conductors would depend upon their length, and the electro-motive force to be allowed. The latter would, no doubt, be limited by the authorities to the point at which contact of the two conductors with the human frame would not produce injurious effects, or say to 200 volts, except for street lighting, for which purpose a higher tension is admissible. In considering the proper size of conductor to be used in any given installation, two principal factors have to be taken into account; first, the charge for interest and depreciation on the original cost of a unit length of the conductor; and, secondly, the cost of the electrical energy lost through the resistance of a unit of length. The sum of these two, which may be regarded as the cost of conveyance of electricity is clearly least, as Sir William Thomson pointed out some time ago, when the two components are equal. This, then, is the principle on which the size of a conductor should be determined.

From the experience of large installations, I consider that electricity can, roughly speaking, be produced in London at the cost of about 1*s.* per 10,000 Ampère-Volts or Watts (746 Watts being equal to one horse-power) for an hour. Hence, assuming that each set of four incandescence lamps in series (such as Swan's, but for which may be substituted a smaller number of higher resistance and higher luminosity) requires 200 volts electro-motive force, and 60 Watts for their efficient working, the total current required for 64,000 such lights is 19,200 Ampères, and the cost of the electric energy lost by this current in passing through $\frac{1}{100}$ of an ohm resistance, is 16*l.* per hour. The resistance of a copper bar one quarter of a mile in length, and one square inch in section, is very nearly $\frac{1}{100}$ of an ohm, and the weight is about 2½ tons. Assuming, then, the price of an insulated copper conductor at 90*l.* per ton, and the rate of interest and depreciation at 7½ per cent., the charge per hour of the above conductor, when used eight hours per day, is 1¼*d.* Hence, following the principle I have stated above, the proper size of conductor to use for an installation of the magnitude I have supposed, would be one of 48·29 inches section, or a round rod 8 in. diameter. If the mean distance of the lamps from the station be assumed as 350 yards, the weight of copper used in the complete system of conductors would be nearly 168 tons, and its cost 15,120*l.* To this must be added the cost of iron pipes, for carrying the conductors underground, and of testing-boxes, and labour in placing them. Four pipes, of 10 in. diameter each, would have to proceed in different directions from the central station, each containing sixteen separate conductors of 1 in. diameter, and separately insulated, each of them supplying a sub-district of 1,000 lights. The total cost of establishing these conductors may be taken at 37,000*l.*, which brings up the total expenditure for central station and leads to 177,000*l.* I assume the conductors to be placed underground, as I consider it quite inadmissible, both as regards permanency and public safety and convenience to place them above ground, within the precincts of towns. With this expenditure, the parish of St. James's could be supplied with the electric light to the extent of about 25 per cent. of the total illuminating power required. To provide a larger percentage of electric energy would increase the cost of establishment proportionately; and that of conductors, nearly in the square ratio of the increase of the district, unless the loss of energy by resistance is allowed to augment instead.

It may surprise uninitiated persons to be told that to supply a single parish with electric energy necessitates copper conductors of a collective area equal to a rod of 8 in. in diameter; and how, it may be asked, will it be possible under such conditions to transmit the energy of waterfalls to distances of twenty or thirty miles, as has been suggested. It must indeed be admitted that the transmission of electric energy of such potential (200 volts) as is admissible in private dwellings would involve conductors of impracticable dimensions, and in order to transmit electrical energy to such distances, it is necessary to resort, in the first place, to an electric current of high tension. By increasing the tension from 200 to 1,200 volts, the conductors may be reduced to one-sixth their area; and if we are content to lose a large proportion of the energy obtained cheaply from a waterfall, we may affect a still greater reduction. A current of such high potential could not be introduced into houses for lighting purposes, but it could be passed through the coils of a secondary dynamo-machine, to give motion to another primary machine, producing currents of low potential to be distributed for general consumption. Or secondary batteries may be used to effect the conversion of currents of high into those of low potential, whichever means may be found the cheaper in first cost, in maintenance, and most economical of energy. It may be advisable to have several such relays of energy for great distances, the result of which would be a reduction of the size and cost of conductor at the expense of final effect, and the policy of the electrical engineer will, in such cases, have to be governed by the relative cost of the conductor, and of the power at its original source. If secondary batteries should become more permanent in their action than they are at the present time, they may be largely resorted to by consumers, to receive a charge of electrical energy during the daytime, or the small hours of the night, when the central engine would otherwise be unemployed, and the advantage of resorting to these means will depend upon the relative first cost, and cost of working the secondary battery and the engine respectively. These questions are, however, outside the range of our present consideration. The large aggregate of dwellings comprising the metropolis of London covers about seventy square miles, thirty of which may be taken to consist of parks, squares, and sparsely-inhabited areas, which are not to be considered for our present purpose. The remaining forty square miles could be divided into, say, 140 districts, slightly exceeding a quarter of a square mile on the average, but containing each fully 8,000 houses, and a population similar to that of St. James's. Assuming twenty of these districts to rank with the parish of St. James (after deducting the 600 shops which I did not include in my estimate) as central districts, sixty to be residential districts, and sixty to be comparatively poor neighbourhoods, and estimating the illuminating power required for these three classes in the proportion of 1 to ½ to ¼, we should find that the total capital expenditure for supplying the metropolis with electric energy to the

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extent of 25 per cent. of the total lighting requirements would be :—

$$20 \times 177{,}000 = 3{,}540{,}000$$
$$60 \times \tfrac{3}{4} \times 177{,}000 = 7{,}080{,}000$$
$$60 \times \tfrac{1}{4} \times 177{,}000 = 3{,}540{,}000$$
$$£14{,}160{,}000$$

or say 14,000,000*l.*, without including lamps and internal fittings, and making an average capital expenditure of 100,000*l.* per district. To extend the same system over the towns of Great Britain and Ireland would absorb a capital exceeding certainly 64,000,000*l.*, to which must be added 16,000,000*l.* for lamps and internal fittings, making a total capital expenditure of 80,000,000*l.* Some of us may live to see this realised, but to find such an amount of capital, and, what is more important, to find the manufacturing appliances to produce work representing this value of machinery and wire, must necessarily be the result of many years of technical development. . . . .

The amount of the working charges of an establishment comprising the parish of St. James would depend on the number of working hours in the day, and on the price of fuel per ton. Assuming the 64,000 lights to incandescence for six hours a day, the price of coal to be 20s. a ton, and the consumption 2 lb. per effective horse-power per hour, the annual charge under this head, taking eight hours' firing, would amount to about 18,300*l.*, to which would have to be added for wages, repairs, and sundries, about 6,000*l.*; for interest, with depreciation at 7½ per cent., 13,300*l.*; and for general management, say, 3,400*l.*; making a total annual charge of 41,000*l.*, or at the rate of 12s. 9½d. per incandescence lamp per annum. To this has to be added the cost of renewal of lamps, which may be taken at 5s. per lamp of sixteen candles, lasting 1,200 hours, or to 9s. per annum, making a total of 21s. 9½d. per lamp for a year. In comparing these results with the cost of gas lighting, we shall find that it takes 5 cubic feet of gas, in a good argand burner, to produce the same luminous effect, as one incandescent light of sixteen-candle power. In lighting such a burner every day, for six hours on the average, we obtain an annual gas consumption of 10,950 cubic feet, the value of which, taken at the rate of 2s. 8d. per thousand, represents an annual charge of 29s., showing that electric light by incandescence, when carried out on a large scale, is decidedly cheaper than gas lighting at present prices, and with the ordinary gas-burners. On the other hand, the cost of establishing gas-works and mains of a capacity equal to 64,000 argand burners, would involve an expenditure not exceeding 80,000*l.* as compared with 177,000*l.* in the case of electricity; and it is thus shown that, although it is more costly to establish a given supply of illuminating power by electricity than gas, the former has the advantage as regards current cost of production. It would not be safe, however, for the advocates of electric lighting to rely upon these figures as representing a permanent state of things.

ARCHITECTURAL STYLE.

Sir,—In his address at the opening *conversazione* of the Architectural Association, the President expressed his opinion that a new and distinct style of architecture "is an impossibility," and although another speaker was quite positive that a new style might be developed "if the very scrupulous adhesion of the very large body of educated architects to some definite lines or principles of design" could be secured, I am very certain that those who have thought about the subject at all will agree with Mr. Hayes, that during past ages all the principles applicable to the practice of architecture have been exhausted. Modern science may do much, but the discovery of a new principle in construction (upon which alone a distinct style can be developed) is, I venture to think, beyond its power. And the speaker I have quoted appears to think that, given the little "if," a style could be evolved in a lifetime or a generation. But I apprehend that a style to deserve the name must be complete and perfect, must have arrived at maturity; and, if so, history proves that every style took a few hundred years in development before it arrived at the inevitable period of decline.

If, however, all this be true, it is no reason for not doing the best we can with the styles we are acquainted with, and I am certain that a great deal remains to be done,—sufficient, indeed, to satisfy all our art cravings. With the principles, the art, the materials, and the wealth at our command in this wonderful nineteenth century, an edifice could be erected which might be quite unique in beauty, splendour, and magnificence, and probably without extra cost upon works in actual existence. And this brings me to the more particular object of this letter.

Of late our attention has been much directed to the East, and I should, therefore, be glad to be allowed to urge the advantages that might accrue if the architects of the West would turn their attention to Oriental details as a means of improving future English buildings, and adding to the resources of Western Pointed architecture. Harmony must, almost of necessity, result, because it would be the revival of a process adopted in the early centuries of Western art, when our Norman ancestors were building churches and palaces on the eastern shores of the Mediterranean with pointed arches, chevron mouldings, domical roofs, and other details, most of which afterwards appeared on our national architecture. Surely these buildings, if studied, would yield further riches. Though the Eastern Pointed style has no elaborate niches, buttresses, or pinnacles, it is distinguished by a breadth and boldness of general treatment, an exquisite refinement of details, and a charming application of coloured materials. The Western artists, however, who brought Eastern ideas to our side of the Alps, neglected the scale and proportions of the originals. Nook-shafts of beautiful materials and 12 in. in diameter, were reduced to insignificant 3-in. colonnettes of limestone. They failed to introduce those noble portals, wide and deep, and reaching to the very summits of Eastern edifices, and which were enriched with inlay of porphyry and serpentino, panels of arabesque mosaic in breccia, and shafts of syenite; and which rivalled in architectural effect the most magnificent portico of Greek or Roman temple.

And it is difficult to understand why those beautiful features of Eastern cities,—the cupola and minaret,—should not appear in our future designs.

Perhaps, then, our Northern Pointed might be refreshed and invigorated by a new infusion from the parent stock in the East. Urban architecture would profit in a specially-appropriate manner, inasmuch as the above smooth and superficial details would enable the architect to dispense almost entirely with complicated mouldings and rich carvings in soft perishable freestone, which are too soon clogged with the soot and *débris* of the London atmosphere, and become eyesores rather than ornaments.

It may be thought that only in Eastern lands are the requisite materials to be found for this phase of Pointed architecture, but the fact is that no soil yields richer treasures for the highest class of buildings than that of the United Kingdom. From Oakhampton and the banks of the Tamar, in Cornwall, a white granite; Mount Sorrel, Leicester, a red syenite; Shap, Cumberland, a flesh-coloured porphyry; the Lizard, a green serpentino; Clee Hill, Salop, a black basalt; Scotland, gray and rose-coloured granites; and these quarries are all in connexion with rail or sea, and some with both, and are a few only of those which exist. The requisite machinery, moreover, has been invented for surfacing and polishing, at a minimum of cost, and increased demand and competition would still further reduce expense. As between such carved and moulded stonework as that of the Houses of Parliament, and a building entirely faced with the above polished materials, with splays only and no mouldings, the difference, as shown by a careful comparative estimate, is only 3 per cent., after allowing 15 per cent. profit. The granite workers, however, demand 100 per cent. profit at present.

H. T.

Mrs. E. M. Ward's Pupils.—News of the good progress made at the studio in William-street, Lowndes-square, bravely established by Mrs. E. M. Ward on the death of her late husband, always gives us pleasure. It is agreeable, therefore, to hear that Mr. J. E. Millais, R.A., on visiting the studio on Monday, the 20th, by arrangement, expressed his great satisfaction in respect of the drawing done there.

PROPOSED ARCHITECTURAL EXHIBITION FOR EDINBURGH.

At the meeting of the Royal Institute of British Architects, on Monday evening last, the secretary read a letter from the Edinburgh Architectural Association, stating that it had been resolved to hold an Architectural Exhibition in the rooms of the National Gallery, Edinburgh (subject to the confirmation by her Majesty's Treasury, of the permission already granted by the Board of Manufacturers). The exhibits will comprise framed and unframed paintings, sketches, drawings, photographs, models, and sculpture illustrative of architecture. These will be received at the Association's Rooms, 20, George-street, on the 13th and 14th of December. It is proposed to open the Exhibition on the 22nd of December by a *conversazione*. The public will be admitted during the following ten days, at a moderate charge. The proposal has met with hearty approval in Edinburgh, and the Council of the Edinburgh Architectural Association hope to have the sympathy and support of the members of the Institute.

We trust that the efforts of the Association in this matter will be successful, as they well deserve to be.

While speaking of the Association, we may add that it has presented a very good syllabus of papers to be read and discussed, and buildings to be visited, during the session 1882-83 just entered upon.

NEW STANDING ORDER OF PARLIAMENT FOR THE DEPOSIT OF PLANS.

At the end of the last session, Mr. Lewis Angell, C.E., engineer and surveyor to the West Ham Local Board, represented to Colonel Makins, M.P. for South Essex, the inconvenience caused to the officials of urban sanitary authorities by reason of the non-deposit of Parliamentary plans affecting such authorities, Standing Orders only requiring plans to be deposited with the practically obsolete "Parish Clerk." In consequence of the action of Colonel Makins, the following new Standing Order has been made, and comes into operation for deposits on the 30th of this month :—

Extract from Standing Orders, Session 1883.

Order 29A.—On or before the 30th day of November, a copy of so much of the said plans and sections as relates to the district of any Urban Sanitary Authority in England or Ireland, in or through which the work is intended to be made, maintained, varied, extended, or enlarged, or in which any lands or houses intended to be taken are situate, together with a copy of so much of the book of reference as relates to that district, shall be deposited with the clerk of that Sanitary Authority.

AN ELECTRIC LIGHT ENGINE-HOUSE ON THE EMBANKMENT.

The Jablochkoff Electric Light Company, which has for some time past supplied the electric light to the Victoria Embankment, are erecting a new engine-house in place of the temporary premises which they at present occupy under the Charing-cross Railway Bridge. The site on which the building is being erected is at the south-east corner of the Embankment gardens, immediately adjoining the Charing-cross Station of the Metropolitan Railway Company. The structure, which is being erected in red brick, will have an elevation to the Embankment, 85 ft. in length, and will be 32ft. in depth. It will consist of one story, and will be about 25 ft. in height, surmounted in the centre by an ornamental turret, and a chimney-shaft at the rear. The engine and machinery in connexion will rest on a concrete bed, excavated to a depth of 6 ft. below the Embankment level. The building has been designed by the company's architect, and Mr. Hook, of Westbourne-park, is the contractor.

A NEW FORM OF INSURANCE.

According to a Continental journal, an insurance company has been established in Paris under the title of "Le Bâtiment." This body undertakes in consideration of annual premiums the maintenance in good constructive and decorative condition of all kinds of buildings. It is stated that the principle of the association is to assure to householders a provision against being prevented by temporary want of funds from having to exercise economy which may afterwards lead to increased expense. The project is not very clear.

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COST OF LAND IN WESTMINSTER BRIDGE-ROAD.

By the erection of some new buildings which have just been put up at the corner of Westminster Bridge-road and Amphitheatre-row, about 150 superficial feet will be thrown into the roadway, through which it will be considerably widened at this particular point. For the purchase of this land the Lambeth Vestry have entered into an arrangement with the owner under which he is to receive 800*l.*, being at the rate of more than 5*l.* per foot.

SECURITY FROM FIRE IN CHURCHES.

According to the *National Zeitung* of Berlin, the Government authorities have been giving attention to the above question. It has been recommended that in all new churches the entrance and exit doors should open outwards, where there is no special obstacle to such an arrangement. When from architectural or ornamental grounds this is not found practicable, it is suggested that doors to exclude draught should be provided, which would open outwards, and that the main doors should be kept open during service time. This arrangement would be equally applicable to existing structures. The matter is being brought before the various local and ecclesiastical authorities, and instructions have been issued for any refusal of compliance on the part of the latter to be reported to the Government.

COMPETITIONS.

Dublin Science and Art Museum.—The five sets of plans selected by the South Kensington authorities out of the sixty-four sets submitted by competitors have been on view in Dublin. Some dissatisfaction is expressed that neither of the selected five designs is by an Irish firm. The designs selected are by Mr. R. Knill Freeman, of Bolton; Messrs. Bromilow & Cheers, of Liverpool; Mr. Charles H. Flack, of London; Mr. Ernest C. Lee, of London; and Mr. Frederick Mew, of London. Mr. Freeman's design is Italian in style, quadrangular in form, with mansard roofs. This design makes provision for an annexe behind the present lecture-theatre for the collection of the Royal Irish Academy. The central feature of the design submitted by Messrs. Bromilow & Cheers is a Corinthian portico. Mr. Flack's design shows a quadrangular building of Classic design; Mr. Lee's design is in the Early French Renaissance style; Mr. Mew's design is Italian. It is stated that the five sets of plans have been submitted by the Board of Public Works to a firm of building surveyors, who are said to have reported that neither of the designs submitted could be carried out for the sum mentioned in the original conditions. It is urged that the whole subject should be re-opened, especially as grave dissatisfaction is expressed with the site proposed for the new building.

Congregational Chapel, Woodford.—In competition with five others, Mr. Thomas Arnold, of 10, Basinghall-street, has been selected as architect for the Congregational Chapel to be erected at Serge-lane, near Woodford.

SULPHATE OF LIME IN PORTLAND CEMENT.

Sir,—In the interesting article in your last issue (p. 648), on "The Examination of Portland Cement," it is stated, "that for the new harbour works at Boulogne the rule was laid down that the cement must contain no more than one per cent. of sulphate of lime." In the interests of all concerned in the manufacture and use of Portland cement, it would be well if further information were forthcoming on this subject.

In the article referred to, nine analyses of Portland cement are given. Calculating from the sulphuric acid found, the percentage of sulphate of lime in these ranges from 2·75 to ·93. The latter is the only one fulfilling the conditions, and, judging from its analysis, I should take it to be one of the worst of the nine cements.

In the appendix to Mr. Grant's paper on Portland cement (Minutes of Proceedings, Inst. C.E., vol. lxii.) nine analyses of different English and German cements are to be found. The sulphate of lime varies from 4·25 to 1·34 per cent., all being above the Boulogne standard.

In Mr. H. Faija's book, "Portland Cement for Users," five analyses of Portland cement are given, and I think it may be assumed that Mr. Faija knew perfectly well the properties of the cements of which he published the analyses. Of these one only would pass the Boulogne test, containing ·51 per cent of sulphate of lime, while the highest contains 1·76 per cent.

From my own practice I have taken seven examples, in each of which the physical and mechanical properties of the cement were carefully studied in connexion with its chemical composition. In every case the cement was of the highest quality. The sulphate of lime ranges from 2·422 down to 1·283 per cent.

Here, then, are thirty different cements, and two only are in accordance with the Boulogne requirements. Cement manufacturers may well ask, What next? Charles Spackman,
The Folkestone Cement Co., Lim., Folkestone.

"OH! MASTER, WE ARE SEVEN."

Wordsworth.

Sir,—In the issue of the *Builder* for November 11th, p. 637, I observe an account of the re-opening of Ashill Church, Somerset, to which is appended the following curious story:—"The building contains several monuments: concerning one of them tradition preserves a curious legend. The wife of a yeoman residing in the parish, and in close proximity to the church, some time during the Middle Ages (parochial record does not state the year) was delivered of seven at a birth. The progeny being too numerous for the husband to maintain until they reached years of maturity, he carried the whole of them away from his home in an apron, with the intention of drowning them in a stream which ran close by. While he was passing the church on the way to carry out his unchristian intention, he was met by the lady to whom the manor belonged, who at once questioned him as to the contents of his bundle. He replied, 'Only a few puppies, which I am about to drown.' Not satisfied with the man's statement, and his strange and excited demeanour arousing her suspicions that something was wrong, she examined the contents of the apron, and found that there were seven children. She rebuked him for his diabolical design, and at once relieved him of his charge. Taking the children under her own care, she brought them up to manhood's estate, and made one of them a prebendary of the Church, and in honour of him, it is said, the effigy has been raised. As giving some slight corroboration of the truth of the legend, it may be mentioned that at the present time Ashill parish is a prebend of Wells. The manor-house is still in existence where the children are stated to have been reared."

Devonshire people are so jealous of that halo of tradition and folk-lore with which their county is everywhere charmingly illuminated, that I may, perhaps, be forgiven for drawing attention to the fact that it is very doubtful whether such a thing ever did occur at Ashill. Indeed, several other places claim the affair.

In my copy of Izacke's "Antiquities of the City of Exeter," published in 1676, I read (p. 17):—"A.D. 1628, Walter Okeston, Mayor. An inhabitant of this city (for so the story goes, and 'twill hardly perswade credit), being a very poor man, and having many children, thought himself blest too much in that kind: wherefore to avoid the charge which was likely to grow upon him that way, absents himself seven years together from his wife, and then returning again, and accompanying her as formerly, she was, within the space of a year thereafter, deliver'd of seven male children at one birth, which made the poor man think himself utterly undone, and hereby, despairing, put them all in a basket, with a full intent to have drowned them; but Divine Providence followed him, and occasioned a lady (then within the said city, and thought to have been the Countess of Devon) coming at this instant of time in his way, to demand of him what he carried in his basket: who replied, that he had therein whelps, which she desired to see, purposing to make choyce of one of them, who, upon view, perceiving that they were children, compelled the poor man to acquaint her of the whole circumstance, whom, when she had sharply rebuked for such his inhumanity, presently commanded them all to be taken from him, and put to nurse, then to school, and so to the university, and in process of time, being attained to men's estate, and well qualified in learning, made means and procured benefices for every one of them. But such like eleemosynary acts in this our age (wherein the charity of too many is waxen cold) are almost vanished."

There is evidently grave doubt as to the precise place where this remarkable affair occurred, for in my Risdon's "Survey of Devon," written in A.D. 1630, but existing only in manuscript until 1714, when it was published in London, there is practically a verbatim account of the same thing, only that Chulmleigh, in Devonshire, is named as the locality. After giving the story, word for word, like Izacke,—save that he defines the deliverer as "a lady of the land," he adds:—"She provided a prebendship for every one of them in this parish (Chulmleigh), but these, her eleemosinary acts of hers, are almost vanished, together with a free school there founded, by the charitable bounty of the Earl of Bedford demolished."

There is yet another claimant. The Rev. J. B. Hughes, M.A., the learned vicar of Staverton, and formerly of Tiverton, stoutly maintains that the birth took place at the latter town. He says:—"The foundations of the ancient chapel wherein the seven sons ministered may still be seen by any one who cares to look for them, in a field called Chapel Close, near unto the 'Seven Crosses,' in the parish of Tiverton."

Exeter, Chulmleigh, and Tiverton are Devonshire places, all within a radius of less than a dozen miles, so that the tradition has an essentially Devonshire character about it, although the exact locality is doubtful.

What foundation exists for Ashill's legend it may be interesting to inquire. Harry Hems.

Wesleyan Chapel, Short Heath, Walsall. The lighting up of this chapel has just been carried out by the introduction of the triple-burner Hesperus lamp, of which Messrs. Jones & Willis are the patentees and manufacturers.

WATER COMPANIES.

Sir,—As a builder I have had 113 of Underhay's bellows-regulator machines fitted in the district of the Grand Junction Water Company, and they have always acted remarkably well where they have been properly treated. I fitted one in a new house last week, and was much astonished to find that the Water Company's inspector would not pass it because it had no separate tank waste-preventer. The machine cost me 52s. 6d. I have removed it, and put in a common Hopper pan with a waste-preventer tank, the two costing 25s., and the Water Company are satisfied. The first used three quarts of water, and the latter requires two gallons each time it is used.

Is this common-sense on the part of the Water Company; and is the common Hopper superior to the Underhay? G. White.

STEAM HEATING.

Sir,—Your recent mention of the steam heating at Lynn, U.S., led me to refer back some weeks in the *Sanitary Engineer* of New York, U.S. I find there an engraving showing the underground pipes, &c., in New York, U.S., amongst them being steam heating-mains, and at many points it is absolutely necessary to insert expansion joints. These must from time to time be a great expense and source of much trouble, and it occurs to me that the explosion referred to at Lynn, was owing,—1. To there not being sufficient of these expansion-boxes; 2. To the boxes becoming corroded, and consequently useless; and 3. To the "iron" pipe, which, being of wrought iron, is the worst for fixing underground, becoming rusted through, and thus affording a weak place in the pipe or main.

Our own gas companies know this to their cost. Why, then, not use copper? And, better still, fix all pipes in trenches when re-laying, that they may be more readily examined. A fine opportunity now occurs for so doing in the various new streets here in London. F. Botting.

A DISPUTED ACCOUNT.

Cliffe *v.* Cotterill.

A case arising out of the contract for the Crewe Cattle Market has just been tried by the judge of the Leeds County Court. The plaintiffs (Messrs. Cliffe & Sons) were brick and tile manufacturers at Wortley, near Leeds. They sued the defendant, Mr. A. P. Cotterill, who resides at Crewe, and is a contractor for the construction of the Cattle Market, to recover 19*l.* 18s. for glazed bricks ordered by him to be used in the construction of the abattoirs.

It appeared from the evidence that the defendant had ordered from the plaintiffs a quantity of glazed bricks,—"quoins, headers, and stretchers." On the arrival of the bricks at Crewe Goods Station, the architect, Mr. W. Telford Gunson, of Manchester, after inspecting them, refused to allow them to be used, on the ground of their inferiority, and the defendant had to purchase elsewhere. The plaintiffs were informed of this, but declined to relieve defendant of his liability and commenced this action.

The judge gave a verdict for the defendant, with costs.

CASE UNDER METROPOLITAN BUILDING ACT.

Fee for irregular building removed.
Wallen *v.* Gray and Davison.

This was a case tried at Marylebone Police Court, November 8th, Mr. De Rutzen, magistrate. Mr. Samuel Price, solicitor for defendants; Mr. Williams, barrister, for defendants.

Defendants had erected a considerable structure of wood in a yard attached to their organ-factory adjoining Diana-place, Euston-road. The district surveyor had discovered the work during its progress, and after surveying it, informed the defendants, who were their own builders, that it was irregular. They, however, completed the structure, and covered in the roof. The district surveyor thereupon served them with notice of irregularity, requiring them to enclose the building with walls, and otherwise render it conformable to the Act. The defendants then wrote, undertaking to remove it 30 ft. from any other building, so as to render it exempt, and the district surveyor replied that if that were done, and the building were, in addition, 8 ft. from Diana-place, he would withdraw the summons. The removal, however, was not carried out; in fact, could not be, for want of space. The proceedings, therefore, went on, and the magistrate made an order in accordance with the notice of the district surveyor to amend the building. The defendants then removed the building altogether, after which the district surveyor demanded his fee in respect of the building, which, being refused, the present summons was taken out. Mr. Williams, for the defence, endeavoured to obtain an admission from the district surveyor that the building had been altered or moved in conformity with the letters quoted, but he was positive that it had been entirely taken down and the site cleared, and was not aware of anything erected there since. Mr.

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Williams, however, argued to the effect that no fee could be claimed, unless there was a permanent building built in conformity with the Act, and that if the building were taken down, or so altered as to become in its altered state exempt, the district surveyor had no claim.

Mr. Price pointed ont that under clauses 49 and 51, taken with schedule 2, a fee is assigned for every new building surveyed by the district surveyor, and that such fee accrues immediately on the covering-in of the roof, and is payable one month thereafter, and argued that the ultimate alteration or removal of such building could not affect the question; and

The Magistrate,—remarking that if Mr. Williams's argument could be maintained, the district surveyor might be deprived altogether of the fee to which he was entitled for discharging his duty,—made an order for the payment of the fee of 2*l.*, with 23s. costs.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

5,378. R. Plush, London. Fastening the sliding sashes of windows. Nov. 11, 1882.

5,383. J. J. Tylor, London. Apparatus for the water supply of water-closets, baths, and urinals, &c. Nov. 11, 1882.

5,435. C. R. Stevens, Lewisham. Apparatus for heating and ventilating. Nov. 14, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named:—

Nov. 14, 1882.

3,444. E. L. Ransome, San Francisco, U.S.A. Artificial stone or concrete pavement. July 20, 1882.

3,741. A. Bouquié, Paris. Manufacturer of bricks, tiles, paving, &c. Aug. 5, 1882.

4,402. S. S. Hellyer, London. Supply and waste-valves for baths, lavatories, &c. Sept. 15, 1882.

4,509. F. H. Noott, London. Drain-pipes. Sept. 21, 1882.

5,179. W. R. Lake, London. Apparatus for flushing water-closets, &c. (Com. by J. Cooper, Boston, U.S.A.) Oct. 31, 1882.

Nov. 17, 1882.

3,361. T. Hughes, Market Drayton. Metallic glazing bars for glazing without use of putty, &c. July 15, 1882.

3,993. J. Hopewell, Salford. Door-mat, boot and shoe cleaner combined. Aug. 19, 1882.

4,679. J. D. Lampard and F. Coppen, London. Cover for protection of bricks from rain. Oct. 2, 1882.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending November 18, 1882.

1,695. G. H. T. Beamish, Queenstown Breakwaters, retaining walls, &c. April 8, 1882. Price 6d.

The bricks or blocks of concrete, or other suitable material, are tenoned into one another to bind the whole wall together.

1,751. W. P. Thompson, London. Window-cleansing chairs or fire-escapes. (Com. by A. Dormitzer, New York, U.S.A.) April 13, 1882. Price 6d.

This improves these chairs by simplifying the clamping arrangement, which consists of a clamping-bar actuated and held by racks.

PROVINCIAL NEWS.

Maidstone.—The new Church Institute in Union-street has been opened by the Venerable Archdeacon Harrison. The building is in close proximity to Week-street, and has a frontage of 42 ft. to Union-street. It is in the fourteenth-century Domestic Gothic style, and is constructed of red brick with Bath stone dressings. It is of three stories, the height to the parapet coping being 48 ft., while above the main entrance is a tower rising to an altitude of 63 ft. This tower and the fenestrals in front make the façade a striking one. There is on the library floor a fine oriel window, supported by boldly-treated corbels with neat mouldings and conventional foliage, while the main doorways and windows are enriched by tracery, and have polished granite shafts with carved caps. Over the doorway is a facial likeness of his Grace the Archbishop of Canterbury, with mitre, very faithfully carved in bas-relief. In the windows and panelling of the doors stained glass has been inserted with good effect, and in the three reading-room windows are represented the heads of Shakspeare, Milton, and Dickens. This room is 30 ft. by 20 ft., and immediately above it are a large class-room and the library, while on the second-floor are situated smoking, dressing, and attendants' room. The main room is the Hollingworth Hall, which, thanks mainly to the liberality of the two gentlemen bearing that name, has been erected for use until such time as the whole plans can be carried out. It is constructed of match-boarding, and its dimensions are 50 ft. by 30 ft. It will seat 300 persons, and is intended to be used for public meetings and entertainments, while it will also be utilised as a gymnasium. The building has been erected from the design and under the superintendence of Mr. E. W. Stephens, architect, Week-street, Maidstone, the contractors being Messrs. Wallis & Clements, of Maidstone. The total cost has reached nearly 4,000*l.*

Banbury.—The foundation-stone of the new Masonic Hall, in the Marlborough-road, was laid on the 17th inst. by H.R.H. the Duke of Albany. Mr. W. E. Mills is the architect of the building. Mr. A. Kimberley, of Banbury, is the contractor.

Lowestoft.—On the 9th inst. the new hospital at Lowestoft was formally opened. The building has been erected at a cost of upwards of 6,300*l.* by Mr. Arthur Bedwell, builder, the architect being Mr. J. L. Clemence. Messrs. C. & T. Lucas, with characteristic liberality, marked the occasion by a donation of 500*l.* to the funds of the hospital.

Norwich.—Extensive new premises for Messrs. H. P. Colman & Co. have been erected in Rampant Horse-street, from the designs and under the superintendence of Mr. Boardman, architect, Norwich. The building is Gothic in feeling. Air-tight cases, by Mr. Sage, of Hatton-garden, are inserted in the series of plate-glass windows that face Rampant Horse-street. One thing that calls for notice is a new lift running throughout the building. This is by Messrs. Thomas & Sons, of Cardiff, who claim to have obviated the risks of accident common to these most useful and indispensable machines, by a mechanical contrivance simple in its character, but very effectual in its operation. No matter what the weight be upon the lift, immediately the hand is removed from the pulley it comes to a standstill, and in the event of the main rope breaking from any cause the descent of the lift is arrested by a spring at once releasing a series of dog-hooks, which take a powerful grip of the surrounding framework. The whole of the basement is effectively lighted, principally by means of Hayward's prismatic lights. The builders were Messrs. Wilkin & Wilkins.

CHURCH-BUILDING NEWS.

Darlington.—The new chancel of St. James's Church, Darlington, was opened on the 7th inst. by the Bishop of Durham. The old portion of the church was completed in 1876. The additions now made comprise new chancel, organ-chamber, and choir-vestry, with heating-chamber under. The chancel is apsidal-ended, and lighted by three geometrical traceried windows. It is raised three steps above the nave, while the Communion-table is raised three steps above the chancel-floor. The division of the sanctuary from the chancel is marked at the walls by light detached stone shafts carrying the roof principals. The roof is an open timber one, with boarded ceiling divided into panels by moulded ribs. The floor is paved with Minton's encaustic tiles. The works have been carried out from designs by Messrs. Clark & Moscrop, architects, Darlington, and under their superintendence.

Preston.—All Saints' Church, Preston, was re-opened on the 12th inst. by the Archbishop of York. The original church was erected in the thirteenth century, and is thought to have been a one-aisled edifice, the only portions remaining being the chancel arch and the arcades on the north side. Late in the fifteenth century the church was extended by throwing out an aisle on the south side, and at the same time the existing clearstory and tower were added. The present rector found the church, with the exception of the chancel, in an almost ruinous condition, especially the north aisle and vestries, and at once set to work to raise funds for the restoration. The north aisle has been rebuilt stone by stone, and fortunately, in pulling down the old walls, the traceried heads of the windows were discovered and have been replaced in their old positions. An open-timbered roof, with carved ribs to the principals, has taken the place of the rough decayed roof which formerly disfigured the church. The stonework throughout the interior has been cleaned and repaired, and the unsightly pews have been removed, open seats being substituted. The restoration up to the present time, including certain works of reparation to the exterior, has cost 1,500*l.* During the excavation for the pavement an interesting discovery was made of the remains of a carved Easter sepulchre in alabaster. The subjects are:—The Crowning of the Virgin; two sets of the Soldiers watching the Sepulchre; the Sacrament of the Eucharist; the Confessional; the Adoration of the Magi; and the Ascension. These have been carefully preserved, and fixed on a stone slab. The restoration has been carried out under the superintendence of Messrs. Smith & Brodrick, of Hull. There were two separate contracts for the work, the first portion being executed by Messrs. Simpson & Malone, of Hull, the latter by Messrs. Wilson Brothers, of the same town. Mr. J. Wilkinson was the contractor for the joiners' work throughout.

Elsecar (near Barnsley).—This church was re-opened on All Saints' Day. It had been closed for the purpose of decorating the walls of the chancel and nave, and erecting a new reredos of wood, with the "Agnus Dei" in the centre, and angels bearing scrolls on either side, with the word "Alleluia" thereon. The work has been carried out by Messrs. Johnson & Appleyards, of Sheffield, from the designs and under the superintendence of Mr. E. Baillie Smith, their designer.

Edgefield.—The parish church at Edgefield, Norfolk, is now in course of being rebuilt. The old fabric has been for a long time disused on account of its dilapidated condition. The whole of the roofs were destroyed about fifty years ago, and the clearstory windows removed, in order to accommodate a roof of one pitch over the nave and aisles, instead of the original arrangement. Such of the old work as still remains will be re-used in the new structure. The church is being rebuilt in a more central position in the parish. The architect for the works is Mr. Sedding. The contractor is Mr. Bartram, of Aylsham.

Beerhackett.—The parish church of Beerhackett was re-opened on the 16th inst., after restoration at a cost of about 1,200*l.* According to Hutchins, "The church was a peculiar of the jurisdiction of the Dean of Sarum, and formerly under that of the Abbot of Sherborne. In Dean Chandler's register it is said to be a chapel, dependant on the church of Sherborne, and dedicated to St. Michael. It is a small structure, consisting of nave and chancel, with north porch and low western tower." The chancel and nave have been renovated, and the old pews replaced with open seats of pitch pine (stained). The walls are of Ham-hill and Doulting stone, cemented inside. Considerable labour has been expended on the chancel. The east window, which is of stained glass, was presented by Mr. A. F. Newington, in memory of his brother, the late Rev. F. Newington. This window has three lights of Perpendicular character, and represents the Crucifixion, treated as a triplet under canopies, while the tracery openings are occupied by angels. The waggon-roof is covered with pitch-pine. The porch has been rebuilt, and new oak doors have been placed at the entrances to the church. The tower is out of the perpendicular, and has been pronounced to be unsafe. Its restoration is, therefore, rendered imperative. Mr. Crickmay, of Weymouth, was the architect, and the contract was taken by Mr. C. Trask, of Norton-sub-Hamdon.

Clocaenog (Denbighshire).—The parish church was re-opened by the Bishop of St. Asaph on the 9th inst., after restoration under the direction of Messrs. Perkin & Bulmer, architects, of Leeds. The church was reseated and the roof reslated in the year 1856. The principal works just completed have been the taking down and rebuilding of the south wall, which was from 15 in. to 18 in. out of the perpendicular, caused by the great thrust of the roof principals and the want of a good foundation. The south side of the roof has been stripped of the slating, and was reslated, after the timbers had been forced, by means of screw-jacks and tie-rods, into their original position. The north-east and south windows and south doorways have been replaced by new work of Ruabon stone. Two additional two-light windows have been inserted in the north wall. The east window, which is a five-light example of the

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

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Perpendicular period, has been thoroughly repaired, and the lower compartments have been glazed with leaded lights of cathedral glass. The upper parts are filled with old stained glass. The wooden sacrarium floor and step have been replaced by Yorkshire stone steps and tiles. The old oak rood-screen, dated 1675, and the oak pulpit, 1695, and all the seating, roof-timbers, &c., have been thoroughly cleaned from the many coats of paint and varnish which they have received from time to time. The walls have been replastered internally, and pointed on the outside with cement. New oak doors to the north and south entrances have been provided; but the old wrought-iron hinges have been re-used. New priests' desks and stalls have been placed in the choir; and an oak lectern designed to harmonise with the rood-screen has been given by a lady. These and some other works to the church have been carried out by Mr. John Morris, builder, Ruthin. The lectern is the work of Mr. J. W. Appleyard, of Leeds.

Books.

Historic Winchester: England's First Capital. By A. R. Bramston and A. C. Leroy. London: Longmans, Green, & Co.; 1882.

Though this is one of the dullest books in style, and one of the most confused in its arrangement, that we have ever opened, it appears to be a useful and careful *resumé* of the main facts in the history of Winchester. The writers of the book state, in a preface, that their principal object has been not to give new information, of which there is none except in regard to the publication of two or three MS. letters, and some local details taken from State Papers, but to collect the known facts so as to form a history of Winchester as a whole, not of different parts of it. To do this, however, it is not sufficient to shovel all the facts together into one book; there must be the faculty of putting them together so as to make an interesting and living narrative, and this the authors certainly do not possess. The book is one to keep for reference, but certainly not interesting or picturesque to read.

We turned over the pages with a view of seeing what light is thrown on the architectural history of Winchester in the course of the book. The references to this part of the subject are mostly brief, and not very clear or satisfactory. The first reference to the origin of the Norman cathedral is given thus:—"Bishop Walkelyn must have looked with some contempt on the Saxon cathedral, grand and massive though it was for the times in which it was built, notwithstanding its being small in Norman estimation, and doubtless disfigured by the rough usage of the Danes. He therefore determined to build a new cathedral worthy of the capital of the great Conqueror," &c. It is not very easy to see what the first part of this involved sentence really means; and the matter becomes still more doubtful when we find subsequent reference to the idea that parts of the present building are remnants of the Saxon cathedral, but without the expression of any decided conviction either way. The progress of rationalism in regard to building accidents is amusingly illustrated by the remark quoted from William of Malmesbury, in reference to the fall of the centre tower in 1107, which was supposed to have happened because the wicked King Rufus had been buried under it, a conclusion which the chronicler throws doubt on, "more especially as the building might have fallen from imperfect construction, even though he had never been buried there." The authors touch upon the period of the lengthening of the choir at the end of the thirteenth century, and the substitution of the polygonal for the apsidal termination, and subsequently refer to the alterations of the nave, first suggested by the work of Bishop Edingdon, the predecessor of Wykeham, concerning which it is observed that "probably there were then, as there have been since, people who regretted the destruction of the massive double arch and simple round-headed windows, and who could see no superior beauty in the Perpendicular style into which their grand Norman nave was gradually to be brought." Probably there were some, as human nature is radically much the same in different periods, and the *laudator temporis acti* is as old as the existence of civilised society; but they would not have been many, nor have made a fashion of protesting against rebuilding, as people do now. The thing was looked at in a different way then; not as a matter of the past, but of the present.

A good deal of information is given in regard to the great bishop whose name will always be connected with Winchester, and who ought to have been a monarch or a prime minister to have found sufficient scope for his commanding intellect and energetic character. His famous piece of work at the cathedral is dismissed, however, very briefly, with merely the statement that he transformed the whole nave from Norman to Perpendicular style, without giving the unlearned reader the briefest hint as to how this was accomplished.

Among matters of interest in the volume is a long letter from Cromwell's Commissioners in Henry VIII.'s time, in regard to their work of appropriating or "conveying" the treasures and plate of the monastery, about which they seem to have experienced some disappointment, the plate being poor and the precious stones counterfeits in many cases; and "the old prior had made the plate of the house so thin" (reduced it in quantity is what is apparently meant) "that we can diminish none of it and leave the prior anything furnished." This shows a polite consideration for the actual needs of the prior, who on his part is stated to have been, together with all the convent, "very comformable"; so that the pillaging seems to have been carried on in a most gentlemanly spirit on both sides. The spoliation of the treasures of Winchester by one Cromwell was to be followed eventually by the destruction of some of the buildings by order of the other and greater man of the name. In 1649, Parliament ordered the complete demolition of the Castle of Winchester. "This was to be done by the county authorities, and it was thought that they would willingly do it 'to provide for their future quiet,' compensation being given to Sir W. Waller. The county did not apparently take the same view of the matter, and two months later came another letter to the Governor of Southampton about it; not only the castle, but also the wall round it, was to be destroyed, and forty soldiers, 'honest men,' were to be sent 'to keep the peace there while the work is going on.'" Two or three more peremptory orders, however, had to be sent before the work was really done. Following on this notice of the destruction of a great relic of Mediæval Winchester, we find information as to the awakening of the first hint of the modern spirit in regard to town life, in some wholesome anxiety on the part of the Mayor and Corporation touching the sanitary state of the town. They considered the present state of the streets as "unbeseeming a place of eminency or of good government," and urged the inhabitants, some of whom had refused to contribute to the employment of a "skavenger," to clean away all that was objectionable, "whereby the streets have for some time past been and continued very noysome," the officials complaining that the citizens in not doing this prefer "their own private ease more than ye pnblique good." A few years later there was an enactment that no person or persons should make any mud wall within the city, or make any hedge in the High-street, on pain of a fine of forty shillings for each offence. At the same time, thatched roofs within the city were forbidden, both on account of the danger of fire and of "the unseemeliness thereof in soe aunciente and famous a citty," and all those existing were within a year to be covered with "tyle or slatt." Considering that long previously to this we find (middle of the sixteenth century) that in Winchester no brewer was to be a drunkard, on pain of a fine of six and eight pence for each transgression, and that only twenty-four persons were to sell ale and beer in the city, and they were to be persons "of good behaviour and honest conversation," it was seen that old Winchester was a tolerably advanced town for its period.

A curious instance of the variation of artistic creed in different periods is mentioned in regard to the altar-piece painted by West in 1777. "So precious was the picture considered that a few years later two of the windows in the clear-story of the choir, containing glass of the fifteenth century, were actually whitewashed to prevent any coloured light being thrown upon this work of West's." This fact ought to suggest caution in regard to some of the specimens of art which receive exaggerated worship at the present moment. About the same time as the painting of this altar-piece, there is chronicled a step in the architectural development of Winchester in the shape of the erection of a number of shops and houses in what a former historian called "the bow-window style." In summing up the building work of recent years, the authors refer to the fact that the Church of St. Cross was restored and "coloured somewhat in the style in which it was supposed to have existed," this work being chiefly suggested by the large donation of an anonymous "O. Z." As far as the painting was concerned, "O. Z." had better have kept his money. There is a good moral, however, drawn in the concluding pages. "A casual observer cannot but be struck with the great importance of even one man's labour, and will notice that it is often the uprightness and energy of a single citizen that leaves a lasting mark by his life's works in the town in which he lived and died. The palaces that kings build for their own glory brought no lasting greatness to Winchester, but the Cathedral of Athelwold and Walkelyn, the College of William of Wykeham, the Hospital of John Devonish and Richard Lamb, the St. Cross of Henry de Blois and Cardinal Beaufort, the Almshouses of Peter Symonds, have not only kept the names of their founders fresh in their memories, but make Winchester famous, even though her trade and her royal favour have forsaken her."

Miscellanea.

The Smoke Abatement Institute.—At a meeting of the Smoke Abatement Committee held on the 18th inst., at the offices, 44, Berners-street, under the presidency of Mr. Ernest Hart, it was announced that the Board of Trade had finally approved of the formation of a Smoke Abatement Institute, and of the articles of association. Communications were read from the Foreign Office enclosing official documents communicated to the Senate of the United States by the President of the United States, containing a detailed report which Dr. Hopkinson, F.R.S., had made on the Smoke Abatement Exhibition at South Kensington for the information of the American Government. Official communications were also read from New Zealand, the Dominion of Canada, and Chicago, conveying information as to the steps taken in those countries, on the impulse given to the question by the action of the Smoke Abatement Committee, and requesting information as to appliances and legislative measures, which was ordered to be furnished. It was announced that the volume containing the reports of the jurors, with detailed tabulation of tests, forming a work of important character and permanent value, with a considerable body of illustrations, was now in the press. Mr. T. W. Cutler, F.R.I.B.A., and Mr. J. Lowry Whittle were appointed a sub-committee to report on the question of the formation of a museum and permanent exhibition of smoke-abating kitcheners, grates, and industrial appliances for public use and information.

Indian Dockyards.—A powerful steam fire-engine, of the Merryweather's London Fire Brigade pattern, has just been supplied to the Indian Government for one of the dockyards. The engine is capable of pumping 350 gallons per minute, and was tested last week in the presence of the officials at the India Stores Department in Belvedere-road. Steam was raised within three minutes to 25 lb. pressure on the square inch, and within ten minutes there were 100 lb. Two 1-in. jets were thrown to a height of 130 ft., and a single jet 1⅛-in. reached 170 ft. The tests were considered highly satisfactory. This engine is specially built for hot climates, and is mounted on wrought-iron wheels of an improved design.

Excavations at Ephesus.—A meeting to promote the resumption of excavations at Ephesus, on the site of the Temple of Diana, was summoned for Saturday afternoon last, in the lecture theatre of South Kensington Museum. Mr. J. T. Wood, under whose superintendence the excavations have so far been conducted, was in attendance to explain their object; but owing, presumably, to the fact that the Royal review was in progress, there was so small a gathering that, after a few words from Professor Lewis, Mr. Wood, and Mr. Newton, of the British Museum, the meeting was adjourned *sine die*.

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Art at Godalming.—On the occasion of the distribution of the prizes gained by the students of the Godalming Science and Art Classes, Mr. Charles Forster Hayward, F.S.A., delivered an address on "Art." In the course of it he observed that the very fact of the existence of the false and absurd æstheticism of the day was a hopeful one, as it was a protest against much that was bad, though itself leading to much the same thing in another direction; but the bend must be the other way to get the thing straight. This false and spurious art, this show of taste in the dress and furniture of the period, however bad, were but the homage paid by the bad to the good, a compliment to the value of something which was not otherwise appreciated. The lecturer drew a favourable comparison between the development of real art in the present day with that existing years ago, and pointed out the facilities, inducements, and encouragements to the cultivation of science and art. He then gave excellent advice to art students, urging them to love their art and enjoy their work, and, above all, to avoid false art, and in connexion with the latter mentioned the "art" shops existing in London, and spoke of artists, Dutchmen and others too, covering their canvas with gold, that is, asking for their pictures as much as would cover them in gold pieces. In conclusion, he asked if it was absurd to hope that they might have in that locality something more than they at present had to help on the cause of art and good taste, science and true progress, such as a public library, a museum, a hall for lectures, and lectures or readings themselves, a small laboratory, and at least class-rooms, where the science and art of Godalming might have local habitation, if it did not eventually gain a name as well.

The New Natural History Museum.—Although this building has been for some time opened to the public, a great deal of space is as yet unoccupied, except by show-cases in various stages of completion; while in the central hall or typical museum, only one of the bays contains any specimens, and these, apparently, are only placed there temporarily. The large detached Spirit Room at the back of the Museum, now approaching completion, has a flat concrete roof, which is being surfaced with Seyssel Asphalte by Claridge's Patent Asphalte Company. This covering is 1 in. thick, and has an area of about 8,000 ft. The parapet walls are being lined with the same excellent material. The workmanship is very good, and altogether the carrying out of the work is likely to fully sustain the reputation of the Company. A useful adaptation of the gurgoyle is seen here, as in other buildings designed by Mr. Waterhouse, A.R.A. At or near the point in the gutter at which the down-pipe occurs, the parapet wall is pierced and a gurgoyle projected, so as to carry off the water from the gutter in the event of the down-pipe becoming stopped.

New Town-hall for Battersea. — The foundation-stone of a new Town-hall for Battersea was laid on the 14th inst. by Mr. Sydney Stern. The site is at the corner of Lavender-hill and St. John's-road, Battersea, close to Clapham Junction Station. The building, which is being erected by the Battersea and New Wandsworth Public Halls Company, has the ground-floor on the two frontages laid out for shops, while on the same floor behind there is a suite of rooms intended to accommodate a social club, and including reading, coffee, smoking, and billiard-rooms, club hall and winter garden, and kitchens and servants' offices in the basement beneath. The public-hall, which is 106 ft. long, 40 ft. wide, and 32 ft. high, is on the first-floor, and entirely fireproof, as are also the staircases and approaches. There are various rooms attached, intended for retiring, cloak, and supper-rooms, caretaker's apartments, and secretary's offices. The style adopted is Queen Anne, with steel-coloured bricks for facings, red bricks for dressings and moulded cornices, &c., and ornamentation will be carved in rubbing bricks. The design was selected from six submitted in limited competition, and is the work of Messrs. Morris & Stallwood, architects, Reading, who are superintending the erection of the building.

Completion of the Ordnance Survey of Scotland.—The Ordnance Survey of Scotland, a work which has been going on for thirty-seven years, has been completed, and the surveying staff is being withdrawn from Scotland. During the last few years nearly 100 men have been employed in the work.

Gas, a Cheap Servant for the Working Man and his Wife.—In connexion with the Gas Exhibition now open at Stockport (previously mentioned by us) a lecture, bearing the above title, has been given by Mr. Thos. Fletcher, F.C.S., of Warrington. We quote a paragraph from it:—"There is no doubt whatever that gas is a very expensive fuel, and that it is very easily wasted. Its real value for the heat produced, as compared with coal, is not one-tenth its actual cost, provided both can be used with equal economy, as they certainly can on a very large scale for steady work; but you cannot make a coal fire for ten minutes for breakfast and tea, and an hour for dinner. Once a day is quite enough to prepare a fire, and it is kept on throughout the day. You burn as much coal to get an ordinary breakfast ready as would, if the same coal were converted into gas, prepare the same breakfast better and, at least, a hundred days in succession. Here is where the economy shows; in the same way, a workman will buy an extravagantly expensive steel tool to do his work, rather than buy a hundred cast-iron ones. He does better work at a less cost, and saves his time in the bargain."

Sidcup National Schools.—These schools, which have just been completed from the designs of Mr. W. Seckham Witherington, architect, 79, Mark-lane and Sidcup, have been opened by the Bishop of Dover. They are erected on a site in the Birkbeck-road, given by the late Miss Berens, and accommodate 160 children. The schoolrooms are divided in the centre by revolving shutters and curtains, so as to separate the boys and girls; and in connexion with each half there is a class-room. The elevation is plainly treated in the "Queen Anne" style. The net cost of the schools, fittings, fencing, and playgrounds was 963*l.*, or 6*l.* per head. The work was carried out by Mr. Gregory, of Clapham Junction.

The Wellington Arch.—In the House of Commons on the 16th inst., Mr. Shaw-Lefevre, replying to Mr. Alderman Lawrence, said the contract for pulling down and rebuilding the arch, including the levelling of the ground and making a new road, was somewhat under the estimate he gave last May. The total was 24,000*l.*, of which 10,000*l.* or 12,000*l.* was the cost of pulling down and rebuilding the arch. Mr. Alderman Lawrence asked if the estimate included the cost of a new pedestal for the statue? Mr. Shaw-Lefevre replied that it would not, as it was possible that the old pedestal would do for the statue in its new position.

Papier Mache Finger-plates.—The Papier Mâché Company, of Wellington-street, Strand, have sent us a few specimens of finger-plates produced in their material. Strange to say, this seems to be the first time this material has been so used, although assuredly adapted for such appliances, at all events of a certain class. They ought to be cheap, and they might be well-looking. The patterns sent are somewhat clumsy, but this altogether depends on the designer. The material would certainly seem to be available.

The Surveyors' Institution.—The rules of examination for all classes of members have been published. The examinations under Divisions I. and II. have been in successful operation for the last two years. Examinations under Divisions III., IV., and V. are now instituted for the first time, and will open the Fellowship to any one (whether in practice or not on his own account) who can pass the examinations. The table at the end of the pamphlet gives a general view of the whole scheme.

Malvern.—Radnor House, the residence of Mr. C. D. Barker, has been altered and enlarged by the addition of new dining-room and billiard-room, principal and secondary staircases, young ladies' room and bedrooms, servants' offices, &c., at a cost of between 3,000*l.* and 4,000*l.* Mr. E. W. Elmslie is the architect employed, and the work has been carried out by Mr. Everal, builder, of Malvern, Mr. W. H. Sheppard being clerk of works.

The District Surveyorship of Clerkenwell.—At the meeting of the Metropolitan Board of Works on the 17th inst., the Building Act Committee recommended that the usual course be taken for filling up the vacancy caused by the death of Mr. Robert Lacon Sibley, late district surveyor of Clerkenwell and part of Islington, and that the Board do proceed to the election on Friday next, the 1st of December.

Floods in Strood.—Sir Arthur Otway has again called attention in the House of Commons to the evils arising from the floods in Strood. On the 16th inst. he asked the President of the Local Government Board whether his attention had been called to the petition presented by him from Mr. Roach Smith with reference to the condition of Strood, which was overflowed by the river Medway, not only causing great damage to property, but great sickness in the town. Mr. Dodson replied that his attention had not been called to the petition, but he was aware that there had been floods at Strood. He added that he continued as sensible as ever of the importance of the inhabitants of the country generally being able to take measures to protect themselves, and that powers should be conferred upon them by Parliament to avert the evils of floods, but he was not in a position to give on the part of the Government an assurance as to the course they would take. The people of Strood should endeavour to act for themselves.

An Arbitration: St. Peter's Church, Plymouth.—The dispute between the Vicar (the Rev. Geo. R. Prynne) and Churchwardens, on the one side, and Mr. Guy, builder, on the other side, in connexion with the closing of the accounts for the rebuilding of the above-named church, has been brought to a settlement. It may be remembered that the matters in dispute were referred to arbitration, Mr. J. Edmeston, F.R.I.B.A., being chosen as the arbitrator. After the arbitrator had held four or five sittings, the matter was compromised by the plaintiff consenting to accept 1,300*l.* in settlement of his claims, each side paying its own costs. We have received conflicting accounts of the circumstances attending this compromise, but we are not concerned to weigh them.

The Proposed Paris Metropolitan Railway.—A report nas been published of an interview between the promoters of the proposed Paris Metropolitan Railway and a committee of the municipality. The promoters propose to construct the railway on stone viaducts, except in the centre of the town, where it would be underground. The entire length of the lines would be 28 kilomètres, and the outlay 100,000,000 francs. The Government, it is stated, will not assent to the concession until the entire capital has been subscribed.

Messrs. Croggon & Co., the well-known galvanised iron manufacturers, have removed from No. 42 to No. 200, Upper Thames-street, where they will have larger and more commodious premises. The firm is one of long standing.

TENDERS

For the erection of the Albert-road Schools, Romford, Essex, for the Romford School Board. Mr. John Hudson, architect, 80, Leman-street. Quantities by Mr. C. Stanger:—

S. J. Jerrard, Lewisham	£4,373 0 0
Giles, Enfield	4,250 0 0
W. T. Niblett, Highbury	4,220 0 0
J. Abrahams, Romford	4,120 0 0
Staines & Sons, Great Eastern-street	4,084 0 0
W. Crockett, Camden-town	4,027 0 0
D. C. Jones & Co., Gloucester	3,975 0 0
J. Hearle & Son, Cable-street	3,882 0 0
H. A. Forse, Bristol	3,825 0 0
W. Wood, Chelmsford	3,820 0 0
J. Brown, Chelmsford	3,750 0 0
Kingerlee, Banbury	3,745 0 0
C. Cox, Hackney	3,700 0 0
C. Barnes, Ilford	3,689 0 0
Priestley & Gurney, Camden-town	3,688 0 0
R. Ward, Croydon	3,686 0 0
S. J. Scott, London-wall	3,683 0 0
W. Shurmur, Clapton	3,645 0 0
S. Woods, Weybridge	3,500 0 0
G. Grimwood, Sudbury	3,493 0 0
J. H. Johnson,* Limehouse	3,383 0 0
Bentley, Leicester	3,318 0 0
T. Russell, Forest-gate	2,991 0 0

* Accepted.

For additions to Heathclose, Dartford, Kent, for Mr. G. Cooper. Mr. Edwin T. Hall, architect, 57, Moorgate-street, London. Quantities by Messrs. Evans & Deacon:—

Marriott Bros., Barnet	£2,083 12 0
M. Patrick & Son, Lambeth	1,793 0 0
T. E. Julian & Co., Southwark	1,790 0 0
Adamson & Son, Putney (accepted)	1,790 0 0

For road-making at Hoylake and West Kirby, for the Wirral Rural Sanitary Authority. Mr. Charles H. Beloe, 13, Harrington-street, Liverpool, engineer. Quantities supplied:—

		Time Required.
J. Nuttall, Bootle	£1,558 7 3	3 months.
Garnett, Liverpool	1,472 4 3	6 ,,
R. A. Aldred, Hoylake	1,373 13 8	6 ,,
Wm. Harrison, West Kirby	1,340 0 0	4 ,,
G. P. Jones, Hoylake	1,334 0 0	3 ,,
J. Taylor, Widnes	1,300 0 0	4 ,,
P. Walkden & Co., Bootle	1,259 0 0	5 ,,
E. Taylor, Hoylake	1,241 16 11	6 ,,
Fawkes Bros., Birkdale	1,185 18 5	6 ,,
Holme & King,* Liverpool	1,091 8 11	4 ,,
MacCabe & Co., Kirkdale	1,045 16 5	6 ,,

* Accepted.

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For the erection of school for 458 children, and caretaker's house, at New Southgate, for the Edmonton School Board. Mr. A. R. Barker, architect. Quantities by Messrs. J. S. Lee & Son:—

	School Buildings.	Caretaker's House.
Johnston	£6,215 0 11	£385 7 9
Patmans	5,823 0 0	342 0 0
Uff	5,687 0 0	337 0 0
Wall	5,690 0 0	310 0 0
Dove Bros.	5,460 0 0	375 0 0
Adamson	5,234 0 0	306 0 0
Goddards	5,014 0 0	332 0 0
Tongue	4,873 0 0	298 0 0
Shaw	4,837 0 0	312 0 0
Foster & Dicksee	4,776 0 0	299 0 0
Horlock	4,730 0 0	292 0 0
Gardener*	4,700 0 0	300 0 0

* Accepted, subject to modification.

For alterations and repairs to Nine Elms Tavern, Nine Elms-lane, for Messrs. Thorne Bros. Mr. T. J. Lynes, architect:—

F. Higgs, Loughborough Junction	£400 0 0
Larcom & Noble	322 0 0
Turtle & Appleton, Wandsworth	278 0 0
Boon	239 0 0
W. Johnson,* Wandsworth-common	235 0 0
French, Lisson-grove	197 10 0

* Accepted.

For repairs to Wick Farm, near Abingdon, for Mr. Newton S. Smith. Mr. Edwin Dolby, architect:—

G. Thatcher, Abingdon	£280 0 0
Buckle & Wheeler,* Abingdon	105 0 0

* Accepted.

For alterations and additions to the Vicarage House, Sonning, Berks, for the Ven. Archdeacon Pott. Mr. Edwin Dolby, architect:—

Williams, Abingdon (accepted)	£1,331 0 0

For alterations to tower and chancel, Hatfield Church, York. Mr. Edwin Dolby, architect:—

Athron Bros. & Gill,* Doncaster	£385 0 0

* Accepted.

For additions to the Lawn, at Littlemore, Oxon, for Mr. W. Gibbs, of Fyntesfield. Mr. Edwin Dolby, architect:—

Williams, Abingdon (accepted)	£1,550 5 0

For re-building pianoforte factory, South-place, Euston-road, for Mr. W. G. Eavestaff. Mr. James Jolley, architect. Quantities not supplied:—

Perkins	£1,354 0 0
Faulkner	1,235 0 0
Harper	1,142 0 0
Gould & Brand	1,049 0 0

For shop-fronts and internal fittings, &c., at Messrs. Woodhead & Clarke's new premises, Shoreditch. Mr. J. W. Brooker, architect, 2, Railway-approach, London Bridge:—

W. Harris	£695 0 0
Kiddle & Sons	680 0 0
Sage	645 0 0
W. H. Lascelles & Co. (accepted)	581 0 0

For alterations to the Relief Offices, Hoxton-street, for the Guardians of the Poor of St. Leonard, Shoreditch. Messrs. Lee & Smith, architects. Quantities not supplied:—

Castle	£285 0 0
Walsh	280 0 0
Collier	280 0 0
Cubitt & Son	275 0 0
Cooper	259 0 0
Cook	247 0 0
Martin & Goddard	241 0 0
Whitlock	236 0 0
Aldridge	225 10 0
Rouse	201 0 0
Lye	197 0 0
Harridine	196 0 0
Hawkins	196 0 0
Ivey	185 0 0
Williams (accepted)	170 0 0

For alterations and additions to 33 and 35, Queen's-road, Peckham, for Mr. Josiah Messent:—
Eldridge & Gee (accepted).

For restoration of St. Etheldred's Church, Norwich. Mr. Edward Boardman, architect:—

Downing & Son	£942 0 0
Holmes	917 0 0
Hall	831 0 0
Hawes	797 0 0

For alterations and repairs at 147 and 149, Ladbroke-grove-road, Notting-hill, for Mr. E. W. Clarke. Mr. W. P. Griffith, architect, 16, Guildford-street:—

Steel Bros. (accepted)	£136 0 0

For new water-mains at Chelmsford, for the Chelmsford Local Board of Health:—

	Maltese-road.	Anchor-street.
H. Tanner	£54 15 6	£91 0 0
T. H. P. Dennis	50 0 0	100 0 0
W. Wood	47 8 4	85 10 0
H. Farrow*	39 10 0	79 10 0

* Accepted in each case.

For the erection of two houses and shops, Hartfield-road, Wimbledon. Mr. R. Cruwys, Bank-chambers, 451, Brixton-road, architect. Quantities by Messrs. Franklin & Andrews:—

Candler	£1,450 0 0
Tyerman	1,275 0 0
Ackerman	1,206 0 0
Robinson	1,125 0 0
Johnson, Wimbledon (accepted)	1,080 0 0

For making Buckleigh-road and sewer, Streatham-common. Mr. R. Carter, surveyor, 11, Queen Victoria-street:—

McKenzie, Williams, & Co., Finsbury	£1,031 0 0
J. Poole, Wimbledon	950 0 0
J. Bentley, Chiselhurst	777 0 0
T. Huntley, Loughborough Junction	738 18 0
W. Carter, Anerley	691 0 0
E. & W. Iles, South Wimbledon	678 0 0
A. T. Catley, Lloyd-square	660 0 0
H. King, Dulwich	625 0 0
H. Wilson, Lavender-hill	587 0 0
Taylor & Ward, Pimlico (accepted)	505 11 0

TO CORRESPONDENTS.

Dr. P.—G. R. S.—G. A. R.—E. J. R.—S. & A.—F. H. W. B.—T. T. L.—G. & H.—J. H. S.—C. F. H.—J. F. H.—R. C.—W. P. G.—M. & Co.—H. C.—E. W. M.—B. N. T.—R. C.—E. C.—C. Sons, R. & Co.—R. E.—T. D. B. & Son.—W. E. M.—M. & G.—J. W. B.—E. B.—E. D.—T. A.—M. & Son.—E. & G.—D. B. & Co.—A. P. D. (Inquiry shall be made).—R. F., Haddington (we cannot give further information).

Correspondents should address the Editor, and not the Publisher, except in cases of business.

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The Builder.

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The Stimulus given by the State to Architectural and Engineering Works.

HERE is no great principle on which we have more felt it to be a duty to insist, when occasion offered, in these columns, than that each art, each science, and each department of business should be dealt with according to its own canons and primary rules. Thus it is for the architect,—and not for the cutting contractor,—to build palaces, no less than churches, mansions, and cottages. It is for the man familiar with the principles of sanitary science,—not for the local representative, whose one object is to keep down the rates, if, indeed, it be not to augment them for some private benefit,—to determine on the sanitary arrangements of urban and rural districts. It is for the educated medical man,—not for the philanthropic amateur,—to tell the world what should be done to give mankind the full benefit of what some hold to be the greatest service ever rendered to the human race,—the great discovery of Jenner. And so it is for the competent statist,—either himself an engineer or guided by the last outcome of the engineer's experience,—to form a judgment as to the advisability, or otherwise, of any great projected public works.

Most of our misfortunes, in the constructive point of view, spring from the neglect of this salutary rule. Do we not see, at this moment, a point of great importance to London,—that of the eastward transit over the Thames,—brought forward on what are called general views; that is to say, in the absence of that definite statistical information which would settle the question, in the judgment of a statesman, but which (for that very reason, may be) each projector scrupulously avoids? Have we not seen how the question of the new public offices, and the utilisation or the spoiling of some of the present sites in London, is made an accident of an accident?

An instructive and, we fear, a very sharp lesson, on this point, is now in course of being taught in France. English people, as a rule, are very little aware of the enormous sums, amounting to from 20 to 22 millions sterling a year, which are now included in the French budget, and borne by the French taxpayers, for the construction of public works in France. Some of these works are not only noble in design, but give full promise of being highly remunerative. Whether the execution by the State of such undertakings be the wisest mode of carrying them out it is not for us to say. It is not, at all events, found suitable in this country. But at the back of undertakings of such national interest that there can be no question (except that above hinted) as to the propriety of their being executed at public cost, come a number of others of purely local interest. It is these works,—schools, by-roads, and what are called secondary railways,—of which the origin is not economical, but political, in which we have long since foreshadowed trouble,—a trouble that now seems to be instant. M. Léon Say, who is the last person to be accused of any want of appreciation of the true value of public works, is seriously alarmed at the continued deficit of the French budget. He points out that all over France works are going on which have cost double the sum at which they were estimated, but which are nowhere finished. It is a reproduction of the old system of the *ateliers*, which broke down so disastrously in Paris. We will not say that it is a close neighbour of that system of public works in Ireland, designed in 1848 as a relief from the pressure of famine, and of which the outcome would be so ludicrous, if it were not so sad. But, at all events, it recalls the memory of that deplorable waste of public funds. And M. Say insists that it is the pressure of local and personal interest on the deputies, and thus on the Ministry of the day, which is the mainspring that sets these wheels in motion.

M. Say's recent utterance, which has been published in the *Journal des Economistes*, has an interest to ourselves, over and above the interest that we must take, on the one hand, in the welfare of our great neighbouring nation, and, on the other hand, in the extension of architectural work and the improvement of communications. He speaks in the most unhesitating way as to the State working of railways. Those of our readers who require any impartial testimony in support of the opinions we expressed as to Mr. Watherston's proposal for the State purchase of the English railways, will do well to read what M. Say has to say on the subject. "The failure," he says,—that is, of constructing and working railways directly by the State,—"is complete and irreparable. The Budget is overladen, while the population, whom it is sought to accommodate, are unsatisfied. . . . . The blunder is colossal." It takes the form of a national disaster. In four years the net yield of the lines forming what is called the old network of the State has fallen off by more than 20 per cent. The proportion of expenses to receipts is yearly increasing. In 1878 it was 76 per cent.; in 1881 it had risen to 84·63 per cent. In three years the deficit has risen to forty millions of francs!

We shall do well to take note of this outcome of State working in France. It has, indeed, to be borne in mind that when the main trunk routes, with a certain amount of branches, are in the hands of great independent companies, the entrance of the State into the field as the constructor and worker of lines which it is not worth while for the companies to make and work, looks like a foredoomed failure. Foredoomed or not, of the failure there is no doubt; and we cannot but attribute this fact in great part to what we have long since pointed out as a grave danger, both in France and in England,—that is to say, the obstinate regarding of a very complicated question from one single standpoint.

Let us grant all that can be said as to the primary importance of communicating roads, railways, canals; on the proper organisation of each in its due place the welfare of a people depends, almost as much as on the cultivation of the ground. In fact, in many parts of the country even more so. Let any one travel along such a line as that from Manchester to Leeds, passing as it does within a few minutes' run from a densely-populated town to a barren moor, and he will understand how it came to pass that the importation of food from abroad took such a different aspect in the eyes of the Manchester manufacturer and of the Leicestershire grazier, or the inhabitants of any rich corn-growing district of the country. But he is a short-sighted friend to the builder who urges the erection of street after street, irrespective of the question what rent may be fairly expected to be forthcoming. It is precisely this mistake that is committed when work is forced,—when houses are built, or roads made, or railways constructed,—in advance of the demands of the population. We are not speaking of a population that grows up with the rapidity of the famous bean-stalk of nursery legend, as is the case in some new countries. But in England, and still more in France, the magnitude of the demands of the future may be, at all events, approximately anticipated. We can tell, if we take the trouble, how many persons would use a new bridge if open to-morrow. So the statist ought to be able to tell how long it would take to create a traffic of 500*l.* per mile over a wild rural district, and he ought to know that until he sees his way to at least such a traffic as that, he will be wofully out of pocket if he constructs a railway even at so low a cost as 5,000*l.* a mile. For all these calculations the data ought to be forthcoming. The mischief is, that those who want works to be done for them, which they are unable or unwilling to do for themselves, are the very last persons to collect and bring forward those data which would show how entirely the required traffic was the creation of imagination, or, to say the least, of a hope that might be long deferred.

As we write come fresh telegrams from Paris, which only intensify the magnitude of the blunders that have been made. M. Herisson, the Minister of Public Works, declares that not only he cannot reduce the sum required for these works in 1883, but that he shall be compelled to spend on the works already commenced the sums voted for the new works. The

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new railways which are to be constructed, in order to complete the scheme of M. de Freycinet, represent an aggregate length of 13,700 miles, of which 9,300 miles have been declared of public utility, and 3,470 are in course of construction. But it has been discovered that the original estimate of M. de Freycinet, which was 160,000,000 sterling, is entirely inadequate to the cost of the works in question, which are now estimated at 360,000,000*l.* This is half the sum spent on the entire railway system of this country! However rich, and however powerful, a country may be, it is to court disaster to plunge headlong into such engagements. It is curious to observe that the scheme thus adopted by the French Government assumes almost exactly the proportions attained by the railway mania of 1845 in this country. The 360,000,000*l.* for which the French Government are now to some extent responsible comprises, indeed, works of all kinds (including school houses) besides the 13,700*l.* miles of railway of a secondary character. The railway projects of 1845 in this country covered 20,687 miles of line, requiring a capital of 350,000,000*l.* Out of this, Bills for 3,753 miles, involving a cost of 130,000,000*l.*, received the Royal assent (see *Edinburgh Review* for October last). Thus, if we infer that the weight assumed too hastily for France is three times what the country can bear, we are not without some justification in our own experience.

The railway committee, on November 24, decided unanimously against the State working and administering all the railways of France. It is a matter of deep interest for all concerned in building, or in public works in general, to watch the conduct of our great neighbour under these trying circumstances. But the true value of the experience thus to be attained at the cost of others lies in the light which it throws on the condition of similar projects in England. From all parts of the country, by public and by private announcements, we receive indications of the awakening and direction of public attention to canals. The great Manchester Ship Canal is only one of those schemes which are already in a more or less advanced condition of preparation. For that, the Parliamentary notices will be deposited, we are told, by the time these lines are in the hands of our readers. Then the Corporation of Preston have resolved on improving the navigation of the Ribble, so as to bring sea-going ships up to the wharfs at Preston. The manufacturers of Stoke-upon-Trent are projecting new canal communication, both with the Mersey and the Thames, as well as with the Humber. The purchasers of the Wilts and Berks Canal have obtained from the Board of Trade running powers, at a low maximum rate of charge, over the Kennet and Avon Canal. The Great Western Railway Company are about to have the damages which they have inflicted on the traders of Newport, by the stoppage of the Monmouthshire Canal, assessed by an arbitrator appointed by the Board of Trade. At the present moment every one,—we could cite many instances,—seems to be waiting for a lead,—waiting, probably, to see how the Manchester ship canal comes before Parliament; but, as far as experience is a guide, it only requires one decided step to be taken by one powerful company to awaken a response from end to end of England. At such a moment it is, therefore, very necessary to raise the voice of warning. In 1845 we knew but little either what railways would ultimately cost, or what would be the result of their development. We have now fifty years' experience as to both these conditions. It is time, and we, in common with the railway reporters of the Board of Trade, have often lamented the fact that we are not put by the Parliamentury returns in so favourable a position as are the publicists of almost every other civilised country, for ascertaining with precision the cost of every description of traffic and the value of new schemes. That want stares us in the face, in the anticipation of a renewed activity in the construction of public works. It is a want of which the schemer, the speculator, and the company-monger of the worst sort will not fail to take full advantage; while, on the other hand, it is a want that handicaps the honest and sober advocate of a sound scheme. It is to be hoped that the labours of Mr. Slagg's committee (which has been hitherto obstructed by the proposal to put Mr. Bradlaugh upon it) will throw some light on this subject. The report of the Committee on Railways (rates and fares), or, at all events, the evidence published with that report, gives much valuable information. What we wish to impress upon our readers is that there are signs of the revival of an interest in certain public works, which may be turned either to national welfare or to national disaster. Although all that ought to be known is not known, yet enough is known,—if people look in the right quarter for the knowledge,—to guide the investor in his choice. Let us beware lest we encounter a second 1845; and let us watch with interest the manner in which the French extricate themselves from a liability for 360,000,000*l.*, which it will certainly demand time to meet.

NEWMARKET PALACE, *TEMP.* JAMES I.

BUILDING CHARGES.

The following extracts from the accounts of the Lord Treasurer's Remembrancer, preserved in the Public Record Office, show the cost of materials used in works and building, with the money disbursed for workmen, at Newmarket Palace, from 1609 to 1625. The first for the year 1609 is as follows:—"Alsoe allowed to the said Accompt' for money by him yssued paide & defrayed for worke and Emp'cons & Provi'cons within the tyme of the Accompte donne and bestowed in and aboute his Ma^{ts} house at Newmarkett, viz., Masons ymploied in cutting, fitting, and setting fower Chymney pannells in the new pryvy lodgings and laying the Borders of the same: Carpenters ymploied in fitting and setting up of planks for Dressor boordes in the privy kitchen and Larder, Setting up a pti'con with quarter boordes in the privy Chamber at the stayres head by the Chamber of p'sence, taking downe and setting up a paire of staires in the said roome; boording up part of a wall between the Larder and the roome where the provi'cons are laid; fastning of quarters to the walls for hangings in the new privy lodgings; making three new Doores of Oken boordes one between the p'sence Chamber and Princes lodgings, and th' between the Lord Fenton's Chamber and his Dyning-roome, and the third for the Prince's wardrobe; making of tables tressells formes and Cupboordes and doing sondry oth' needefull woorke aboute the said house. Bricklayers and Tylers ymploied in paving wth bricks a gutter betweene the King's house and the house next adioyning; making a vantle of bricks from the said gutter throughe the Bottlehouse and greate entrie to convey the Rainewater into the old vantle; paving with paving tyles the floores at the staires foote going up to the pallett chamber; paving of div'se broken places in the hall; making of Raunge; mending the broken harthes and Furnace; setting the panne in the Scullery; tyling div'se broken places over the Privie lodgings & over the olde lodgings about the house; Plaisterers ymploied in lathing and laying with plaister of parris & lyme and haire the outside and inside walles ceelings and p'ticons of the newe lodgings, the stoare-house, the pantry, the buttery, the wyne-seller, and the groomes of the privy chamber their lodging. Thatchers ymploied in covering wth strawe the Back-side of the olde house over the staires which were brought up at thende of the lodgings and over the privy kitchin and scullery. Plombers ymployed in laying wth sheete lead the greate Cornish on the forefront of the newe lodgings, playning and fitting of quart^{rs} for footeplates there and helping to boorde up the pti'con in the p'sence. Sawyers ymploied in cutting of timber into div'se and sondry scantlings; and Labourers attending the said woorkmen & doeing sondry other necessary busynesses there; for p'formance of all wh^{ch} woorkes diverse quantities of Em'pcons & Provi'cons have been made and bought, the p'ticulars whereof, with their quantities, nombers, and price, as also the chardge of carriage, wage of artificers, woorkemen, labourers, & others ymploied in these services doe hereafter more p'ticularly ensue, viz."

Then follow the different items, the materials used, with the cost of each, from which it appears that four chimney panels of stone cost 16s. each; 29 ft. 6 in. of border-stone cost 8d. a foot; timber cost 8d. a foot; deals cost 5*l.* 14s. 4d. the 100; ash poles, 6d. each; lime, 8d. the load; sand and gravel, 6d. ditto; bricks, 13s. 4d. per 1,000; laths, 30s. the load, &c. The workmen's wages per day were as follow:—Masons, 18d.; carpenters from 10d. to 18d.; bricklayers, from 14d. to 17d.; plasterers, from 14d. to 22d.; joiners, 18d.; plumbers, 18d.; labourers, from 9d. to 12d.; sawyers, 2s. 6d. the couple. Two clerks of works had 1s. a day each. Piece-workers were paid a lump sum for a certain job,—all materials being found by the king. Richard Griffin, for laying 303¼ square yards of bulrush mats in the king's new privy lodgings and the noblemen's lodgings, finding mat-nails, pack-thread, &c., was paid at the rate of 8d. per yard. The total amount expended on the Royal Palace at Newmarket, in this account, was 457*l.* 6s. 4¼d.

In the following year 59*l.* 4s. 4d. was expended on the works and buildings at the king's palace at Newmarket. The articles included timber, lime, gravel, sand, hair, solder, bindingrods, reeds, straw, candles, ropes, nails, ironwork, glass, and glazing, to the value of 27*l.* 5s. 4d. Among the workmen employed were carpenters, bricklayers, thatchers, plumbers, joiners, sawyers, and labourers. Thomas Pointer, clerk of the works, was employed for forty days at 4s. per day (including horse-hire). John Pigott received 4*l.* for framing, raising, and boarding a floor in Mr. Bohennon's lodgings in the privy buttery, 16 ft. long and 15 ft. wide, with a new pair of stairs leading up the same, taking down the old roof and raising a new one with a "dormer" window; taking down a partition wall between the privy buttery and pantry, and laying fittings, "he only finding workmanship." Altering a smoky chimney cost 22s. For laths, lime, and hair used in the walls and ceilings of Mr. Bohennon's lodgings, 39s. 4½d. was charged. John Wyatt, the painter, was paid 27s. 1d. for repairing, stopping, and laying in white-lead, colour in oil, twenty-two lights and double casements, &c., in the presence chamber, where also some new timber cornices cost 9s., while the same apartment was embellished with four score and nine yards of bulrush mats at an expense of 49s. 6d.

In the accounts of money laid out on the Palace at Newmarket for the ensuing year, which amounted to 162*l.* 2s. 8d., the sum expended on materials came to 76*l.* 4s. 2d.; land carriage, 9*l.* 5s. 9½d.; wages, 66*l.* 1s. 2½d.; riding charges for the clerk of works and surveyor, 10*l.* 8s.; and 3s. 6d. given in reward to the keeper of the clay-pit for "permittinge fetchinge of xxj lodes at 2d. the lode." These sums were chiefly spent in defraying the cost of taking down two partitions between the prince's bed-chamber and the presence-chamber, "for his highness more easy passage from there into thother," and in mending the ranges in the kitchen, tiling over the king's presence-chamber and divers other lodgings about the house, and soldering and mending cracks in divers gutters. The cost of the materials employed, artisans' and labourers' wages are then given in detail, somewhat similar to, and at about the same rates, as in the preceding accounts.

In the financial year of 1612-1613, 85*l.* 8s. was spent "in and about his Ma^{ts} House of Newmarket" in covering vaults, boarding up partitions, setting up shelves, making sliding windows, tables, trestles and forms, screwing and strengthening the floors that were sunk; tiling divers lodgings, setting up pans, and "layeing of Footpaces," and doing many other needful works there with the materials, quantities, prices, carriage, artificers, &c. The items are much the same as before. Lord Montgomery's lodgings were carpeted like the rooms of the king and the prince [? Henry] with bulrush matting.

For the year 1613-1614, 46*l.* 9s. 11d. was expended upon 10 ft. of oak timber at 8d. the foot; 1,400 of ½ in. boards at 10s. the hundred; and other timber of different thickness; lime, laths, tile-pins, hair, ironwork, nails, glass and glazing were also supplied. A well-rope for the stables cost 2s. 6d., and a bucket for the well 2s. Three loads of gravel and sand were bought at 6d. the load. The carpenters, bricklayers, and tylers were paid at the rate of 1s. 4d. per day, and labourers 1s.

The amount of money expended on the royal palace at Newmarket in the following year was no less than 4,660*l.* 11s. 9½d. This heavy expenditure was chiefly incurred for building with stone and brick a pile of new lodgings for the king, with a great chamber, presence-chamber, &c., and rooms both under and over the same for noblemen and gentlemen of the bed-chamber, as also for other works done there during seventeen calendar months, commencing May 1st, 1614, and ending September 30th, 1615. This account is very long and interesting, and covers two membranes. The cost of

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materials and the workmanship was about equally divided. Building ground in Newmarket was cheap in those days. John Ramsey received 5*l.* 10s. "in full payment of the absolute purchase and sale of a parcel of ground containing in length 30 ft., and in breadth 19 ft., whereon part of his majesty's new building is extended, and was taken in to make the said building to range straight." * The walls of the new buildings were three bricks in thickness from the foundation to the ground-floor, and from that elevation upwards they were two bricks in thickness. The garden was enclosed with a new brick wall, and 780 square yards of new bulrush matting were laid in the king's bed-chamber, the prince's lodging, the privy lodgings, the chambers occupied by the Earl of Montgomery, Lord Haddington, and Lord Hayes, and certain lower rooms of the new buildings, which, at 9d. per square yard, cost 39*l.* 17s. 6d.

The works and buildings at the palace for the ensuing year were also considerable, when the cost came to 2,606*l.* 13s. 2d. The new premises consisted of a new brewhouse, "a greate new stable for the great horses," a kennel for the king's privy hounds, with lodgings over them; besides sundry works and repairs about the house and tennis-court; "setting up of div'se postes in the stable close for managing of great horses to runne at the ring," &c.†

Workmen's wages had increased. Masons now received 2s., 22d., 20d., and 18d. each a day; carpenters 2s. 2d., 2s., 22d., 20d., 18d., and 1s.; bricklayers, 2s. 2d., 2s., 22d., 20d., 18d., and 16d.; plumbers from 22d. to 18d.; plasterers, 22d. to 7d.; mat-layers, 22d.; sawyers, 3s. 4d. the couple; joiners, 18d.; lathmakers, 18d.; and labourers, from 1s. 4d. to 10d. Most of the stone used was brought from Northampton; 12*l.* 2s. 8½d. was spent on new bulrush mats for the king's gallery, the withdrawing-chamber, the Lord Chamberlain's bed-chamber, and the apartments of the Earl of Pembroke, Sir George Villiers, Lord Hayes, and the Secretary of State in attendance; the king finding in some cases nails and packthread, and in others "nayles onely." Richard Fann, for looking to and setting the clock, received a present of 8s., while he was rewarded with 2s. 8d. for cleansing the well and digging it deeper. The new stables and the kennel cost 1,704*l.* 19s. 5½d.

In 1616-1617, 2,446*l.* 3s. 0½d. was laid out on the king's establishment at Newmarket in building "a faire lardge newe stable for the great horses, a new doghouse with lodgings over it, a brewe-house, riding-house and store-house, as alsoe levelling the tenis-court with bricks, and laying the same with paveing tyles upon the brycks; thatching the king's hey barne; laying the gutters between the brew-house and store-house; making perti'cons, doores, tressels, and formes; joysting and boordinge of floores, with dooeing sondry other workes and repairs about the said house," &c.‡

During the ensuing year only 467*l.* 15s. 4½d. was spent on this palace chiefly on account of a stable, with lodgings over it, for Sir Thomas Compton; alterations and extensions to the king's great stable; "making great tables, cupboards, tressels, formes, and screens for feasting the Germany prince and Sweden ambassador"; likewise "for bringing up the fence-wall by the tennis-court, and another low fense wall into the churchyard over against the great gates with brick and stone, and in doing sundry other works upon and about the said house," &c.

The accounts for the following year are not extant, but in those for 1619-20, which amount to 2,719*l.* 15s. 6½d., we learn that some old buildings and sheds towards the street were pulled down and the ground cleared for the erection of additional lodgings of brick and stone, a wooden gallery, and offices for the prince. There were also a farrier's office and coachhouses built. The woodyard was enclosed with a stone wall. Lodgings and store-houses were erected for the clerk of works. For framing and raising "a roome on the back side of the kinges privy kitchen for the Marquis of Buckingham, with washing, boarding, lathing, and tileing the same, quartering a partition there"; and setting up racks, mangers, and stalls, and other miscellaneous work, including decorations to the ceiling of Buckingham's new lodgings, considerable expenses were incurred. As usual, new mats were provided for the king's chambers, while in other subordinate parts of the palace the old ones were mended and pieced.

In the year 1620-21 the royal works and buildings at Newmarket cost 975*l.* 2s. 6d. This amount is made up of a variety of miscellaneous items, too numerous and diffuse to mention in detail. A new well was sunk five fathoms deep to serve the king's and prince's kitchen, for which the labourer was paid at the rate of 5s. the fathom. New bulrush mats were supplied for all the principal apartments and stairs of the palace.

The accounts for the ensuing year are of a somewhat similar description, when 238*l.* 2s. 8½d. was laid out on works and buildings in and about the palace.

In 1622-1623 the sum of 253*l.* 2s. 6d. was expended in mending the wainscot, shutting windows and casements in the king and prince's privy lodgings, planking in the prince's great horse-stable, repairing the rack in the king's great horse-stable, a wainscot casement at the end of the tennis-court and the bins in the king's pantry; setting up shelves in the Groom of the Stole's lodging; setting up ledges on the walls of the great horse-stable, with strong pins to hang saddles; setting up a shed to boil fish for the prince, setting up shelves in the lodgings of the prince's secretary, boarding part of a decayed floor in the wardrobe, making a high stool with steps to ascend the top of it for the prince to run at the ring, making a new hearth and range in the king and prince's privy kitchen, mending the hearths and setting the pans in the boiling-house for fish, mending the chimneys in the great and presence-chambers, running up the lower lights in the dog-house, mending the walls in the prince's gallery, new lathing and laying the walls of the stable in the timber-yard with lime and chopped hay, new matting a room for the Marquis of Buckingham and a chamber for the master of the prince's robes, and piecing and mending the broken mats in the king's privy lodgings and the lodgings of the Marquis of Hamilton, the Earl of Montgomery, and the Marquis of Buckingham. Among other expenses, John Straver and Humphrey Warcup received a present of 22d. for carrying letters from Newmarket to London, and 6s. to a labourer for his attendance during five days at the water-side to see the bricks and tiles safely laid up and loaded at Freckenham.

The works and building at the palace at Newmarket for the following year, only cost 187*l.* 9s. 10½d., and included boarding and mending the stalls broken in the "hunting horse stable and in the Duke of Buckingham's stable"; shoring up the old house on the west side of the Court "dangerously shaken with wynds," raising the poles in the dog yard on boards "in bredthe rounde aboute"; bringing up and finishing the stack of chimneys that served the prince's bed-chamber and other buildings, and mending them "for avoydinge the smoake"; taking up the paving-tiles at both ends of the tennis-court and "new paveinge one end agayne." A bucket for the stable well cost 2s. 6d., a well-rope, 2s. 6d., and a leather for the pump, 1s.

The account for the year 1624-5 (which is the last whole year of James I.'s reign in this series)* for works and buildings at the Palace of Newmarket represents a disbursement of 148*l.* 5s. 6½d. It thus appears that 20,383*l.* 13s. 2d. was laid out on this palace during the reign of James I. from the year 1609 to 1625, being an average of about 1,274*l.* per annum.†

J. P. H.

DEFECTS IN FURNISHED HOUSES.

A CASE was tried before a judge and jury at Westminster within the last few weeks, in which a landlord sued for rent, and a tenant denied that it was due, as he was obliged to leave the house since it was infested by bugs. The result was a verdict for the landlord, but we gather from the report of the case that the jury did not consider that the house in question was, if we may say so, immoderately infested by bugs. It is well, having regard to this case, that the actual state of the law in regard to defects in furnished houses should be understood. A good many years ago, it was decided that when a house is let furnished, there is an implied condition in the agreement that the house is fit for occupation on the day on which the tenancy begins. That case arose out of a house being infested by bugs, and though it has frequently been discussed in recent years, the main principle as applied to furnished houses and lodgings, as distinguished from unfurnished houses, has never been disputed. But it should be borne in mind that it does not refer to any houses except furnished ones, and therefore a tenant who takes an unfurnished house and finds it unfit for habitation on account of sanitary defects has no remedy against the landlord unless he or his agent has represented that it was in a fit condition for habitation. Whether this state of the law does not conduce to bad drainage and defects, is more than doubtful, but it cannot now be changed except by some legislative enactment. In the year 1876, the "famous bug case," as it is styled, was succeeded by one which may not inappropriately be called the famous drainage case, in which the same principle was still further strengthened, since the judgment of the presiding judge concluded with these words,—"It is an implied condition in all hirings, *i.e.* of a furnished house, that the house shall be in good and tenantable condition, reasonably fit for human habitation and for comfortable habitation, and from the very day on which the tenant is to enter down to the very day on which the tenancy is to cease, otherwise the tenant has not what he has contracted for." These are words which might well be hung text-like over every house-agent's desk, and it would be well if these persons would always impress them on their clients. The actual case in which this judgment was delivered does not need minute consideration; it is sufficient to state, as exemplifying the reckless way in which persons make assertions, that the agent stated by letter that the owner of the house "believes the drainage to be in perfect order, as she is very particular herself on this point, and there has been no infectious illness of any kind in the house." As soon as the tenant arrived, a disagreeable smell was perceived, and on examination it was found that there was a cesspool full of filth in the butler's pantry within 2 in. of the floor!

It is obvious that a house in such a state was not reasonably fit for human habitation; therefore, that the principle which we have already mentioned applied. Some amusement appears to have been caused in court during the latest case of reference to a single and solitary bug, and though this may seem trifling, it is clear that, in a rather comic form, it exemplifies a principle. To prevent a house being habitable it is not enough that some slight inconvenience should be caused to the tenant; his enjoyment and comfort must be materially interfered with. Some persons may have crotchets as to ventilation, but because a house is not supplied with some particular system it does not follow that the house is not, in general opinion, fit for habitation, though in the view of this particular person it may be unfit. It is often said that the word "reasonable" or "reasonably" is too vague, but, in fact, it guards against individual caprice, and it answers to an expression which

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* In 1617 a further purchase of land, consisting of three roods, was made for extensions to the palace, as appears by the following copy of agreement, &c.:—

"Right trustie and right welbeloved Cousin and Councellor, We grete you well; and will and comaund you that vnder or privy Seale being in yor custidie, you cause or ires to be made foorth in forme following. James, by the grace of God, &c. To the Trer. and Vnder-Trer. of or Exchequr greeting. Whereas Sr John Cotton, Kt, and some of the officers of or works, have made composicon wth Reginold Gawen, of Newmarkett, for a small parcell of land, contayning three roods or thereabouts, lying on the backside of a house in Newmarkett (comonly knowne by the name of the Star), in or County of Cambridge, on wch peece of ground are lately erected a Brewhouse, and a Storehouse for or vse and service. We doe hereby will and comaund you out of the Treasurie remayning in the Receipt of or Exchequr to cause paymt to be made vnto the said Reginold Gawen or his Assignes, of the Some of threescore pounds in satisfaccon for the said peice of ground, wthout accompt, Imprest or other charge to be sett vpon him or them for the same, or any p't thereof. And these, &c. Given, &c. And these or ires shalbe yor sufficient warraunt in that behalfe. Given vnder or Signett at or pallace of Westmr, the sixt day of January, in the fourteenth yeare of or Raigne, France and Ireland and of Scotland the fifteth. R. KIRKHAM.

Endorsed. To or right trustie, and right welbeloved Cousin and Councellor, Edwarde Earle of Worcester, Keeper of or privey Seale."

† A sum of 8s. is charged for extinguishing a fire that broke out in the timber-yard, which at one time threatened to destroy the palace and appurtenances.

‡ Francis Carter, chief clerk of the works, was allowed 40s., which he gave to Sir William Carway for changing 40*l.* in silver into gold "for the easier carriage of it down, and in consideration it was paid ten days sooner than it was due to the king." He was also allowed 73s. 1d. for the charges of himself and three others "for safeguard of the same iiijc li to Newmarket" (Account No. 55).

* Compare some fragmentary accounts in the British Museum from 1609 to 1614, sub. tit. Newmarket (MS. Add. 12,498). Heavy expenses attended the maintenance of the royal stables at Charing-cross, York, St. Alban's, Hampton Court, Tutbury, Theobalds, Royston, Enfield, &c.

† L. T. R. Works and Buildings, Nos. 46-62. MS. Public Record Office.

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would state, in so many words, that a house or a thing is to be in a certain condition, the test of which is the opinion of a fair number of ordinary persons. "Reasonably fit" means, in fact, that it is fit in the opinion of average persons. When, however, it comes to be considered that sanitary principles are now much more understood, it must be obvious that the average opinion will now expect a furnished house to be in better condition sanitarily than would have been required some years ago. Let any one remember how few houses, not many years ago, had absolutely no system of drainage-ventilation connected with them, and how, in the opinion not only of sanitary reformers, but of most intelligent householders, some such system is now considered essential to a healthy house; and then, if the principle we have mentioned be also borne in mind, it is obvious that its recollection should make all owners of furnished houses most particular as to the sanitary state of their residences. Because no disagreeable smells are at once perceived, it does not follow that a house is in a wholesome state, and we should be much inclined to say that if a tenant took a house which had no drainage-ventilation, a special jury in London would be much inclined to say that it was not reasonably fit for habitation. Therefore, not only for the sake of the general health of the community, but for the sake of their own pockets, every owner of a house, whether in town or country, should see that it is in the best sanitary condition, otherwise when it comes to be let furnished he may find himself tenantless, rentless, and embarked in litigation. We can only regret that the principle we have been touching on in these remarks does not apply to unfurnished houses, and so prevent not a little bad building.

"ON SUNDRY WORKING DRAWINGS." *

When I was asked to read a paper to this Association I did not like to refuse, and yet I felt that I really had but little to say beyond what I have already said at one time or another in these rooms, either with regard to the general principles or the practice of the art of architecture. It is true that a very tempting list of subjects suitable for architectural essays was kindly submitted to me by your officers, from which I might have selected a theme whereon to discourse; but I thought that the task of working up the necessary materials for such a lecture might fairly be left to some of the rising younger men in the profession, who have both more time and ambition for such a purpose than I now have. It struck me, however, that there must be, or at least ought to be, stored in the folios and memory of one who has been so long in architectural practice as I have been, drawings and incidents which, though doomed to ultimate and speedy oblivion, might be temporarily revived for the advantage of his younger brethren upon such an occasion as this. I chose, therefore, the title of "Sundry Working Drawings" simply as a convenient peg whereon to hang, as it were, some gossip which might suffice to occupy one of the evenings of your session. If this should prove, as I cannot but fear it will, to be of questionable taste, as partaking somewhat too much of an egotistical nature, I still venture to hope that, though it may lay me open to censure on that account, it may not be altogether a waste of your time and attention to listen to it. Should I not have been entirely mistaken as to this idea, it is possible that my effort may serve as a hint to other architects, whose stores and reminiscences are of greater value than mine, and lead them to follow my example. Then, if such could be induced to look over the contents of their shelves, and to dip into the pages of their diaries, and extract thence, for the benefit of their juniors, some of the details and particulars of their professional experience of greater value for instruction than mine can pretend to have, I shall feel more than rewarded for the little trouble that the preparation of this paper has cost me.

"Working drawings" being the nominal subject that I have now to deal with, I shall commence by making some few remarks upon their features and characteristics. Working drawings may be subdivided into what may be termed, for the sake of distinction, general working drawings and detail working drawings. The former of these are usually drawn to the scale of one-eighth of an inch to a foot, except in cases in which the buildings are very extensive, when the scale of one-sixteenth of an inch to a foot is frequently used. Neither one nor the other of these scales, however, is, in my opinion, the best adapted to set off to advantage a design, the detail of which is of a character at all elaborate. Then the scale of one quarter of an inch to a foot is altogether too large for general working drawings, and it makes the drawings quite too cumbersome in size. In my opinion the scale of three-sixteenths of an inch to a foot is the one which gives the best effect for such general drawings as it may be thought worth while to take some exceptional pains with, although it is true that it is somewhat troublesome, and is objected to by builders on account of its being unusual. For detail working drawings the scale of one-half inch to a foot is the one that is the most suitable for brickwork and stonework, and that of an inch to a foot for woodwork generally; but for roofs, and suchlike designs in wood of large size, the half-inch scale will suffice. Mouldings and the like should, however, be always drawn out full-size; as it is not safe to allow workmen to enlarge them for themselves from drawings to smaller scales, there being considerable risk of the delicacy and essential features becoming more or less spoiled during the process.

The term "working drawings" distinguishes those which are intended to direct the actual execution of the work from either probationary drawings, for which less accuracy and more artistic effect is necessary, or from drawings of executed work, such as may have to be done by students for exercise or in competition for medals and prizes. The minute and painstaking character expected in the latter cannot be maintained in ordinary actual practice. For working drawings, therefore, the primary essential is clearness rather than technical excellence or beauty of draughtsmanship. For this reason the representation of shadows is to be avoided in them, and I need hardly say that backlining, once so fashionable, and which is but an affectation of proper shadowing, is quite inadmissible. Colouring to working drawing should be used simply for the purpose of distinguishing the different materials, and the same colours should always be used for the same materials. The printing and writing should be distinctly legible, though, of course, it is desirable that it should at the same time be somewhat characteristic.

Economy in the preparation of working drawings is a most important point for consideration, both as regards the labour and cost. For though an architect is only supposed, according to the regulations for professional custom of the Institute of Architects, to be obliged to supply one set of drawings and one set of tracings, these fall far short of the usual demands in practice; nor is it often, according to my experience, politic, if possible, to seek or obtain additional remuneration for further copies, although fairly chargeable. My own custom in this respect is to keep my working drawings in pencil, so that I may be able at any time to make any alterations required therein. From these pencil drawings I have tracings made, in strong black ink, upon white tracing-paper, whence other copies may be taken and multiplied by means of photo-lithography. I am thus enabled, at a comparatively small expense, to supply as many sets of the working drawings as may be called for by employers, surveyors, builders, or societies. By the same means also, especially in the case of old buildings destroyed, restored, or altered, the folios of the Institute and this Association may and should be enriched.

It is upon the character of his working drawings, rather than upon that of his preliminary sketches, valuable as an able and artistic treatment of those undoubtedly is, that the ultimate reputation of an architect depends. It is those only that actually affect the work itself. Upon the clearness and accuracy of the working drawings alone do the employer's interests and immunity from disputes and extra charges depend, so that they require, and should receive, all the care and attention that can be bestowed upon them. Doubtless, therefore, you have often determined that, come what will, these at least should have your own personal work, and that they should represent you, as it were, and all that is in you, and that their study and completion should precede the execution of the contract. But, alas! man proposes, but fate and circumstances too often dispose otherwise, and you frequently find to your disappointment and regret that, after complete and elaborate sets of both general and detail working drawings have been prepared, it has proved that it has only been to be set aside in consequence of some change of purpose, with or without reason, on the part of your employers, and then that the whole work has to be done over again. You thus get to learn by experience that circumstances compel some compromise between the perfection of working drawings that you would yourself desire, and such comparative imperfection as may just suffice to secure the work being properly carried out. This, it need hardly be said, will not reach that standard of excellence which is so often attained by the student competitors for the medals and prizes of the Institute and this Association. Sometimes, instead of letting the preparation of the detail working drawings follow that of the general ones, so as to be simply explanatory thereof, I reverse the process, making my designs at once, after mere preliminary sketches, to the scale of ½ in. to a foot. This plan reduces the working-out of the smaller-scale general drawings completely to a mere mechanical operation, so that it can be done without any personal supervision on my part, and yet with certainty that the character intended for the detail will be preserved throughout. By this means my own time and attention is able to be concentrated upon those parts of the work which alone demand thought and design, the rest being left to be done entirely by others. I was able by this means, in the case of the competition for the Law Courts, to dispense with any increase of my staff, and not to disarrange at all my ordinary practice, whereas I remember to have heard almost all my competitors complain of having suffered severely in both those respects.

It is time now to descend from generalities and to speak of particulars, and I think that the most convenient way of arranging the matters I propose to bring before you will be in what may be termed brief, isolated, autobiographical passages, placed in chronological order, which will admit of occasional divergence as subjects appear to suggest themselves. My excuse for these must be that in reality an architect's life is represented in his works, and his works constitute all that in his life is worth any record at all.

Most of my early professional experience was obtained in the diocese of Llandaff, in connexion with its diocesan work. In the year 1851, the period of my apprenticeship to Professor Donaldson having expired, I spent three months in a rapid sketching tour upon the Continent, in companionship with the late Mr. Thomas *Hill*. Immediately after my return I was fortunate enough to receive a commission to build an hotel at Southerndown, a small watering-place on the coast of South Wales, near Bridgend, in Glamorganshire. After my first visit to that neighbourhood to inspect the site, I stopped on my way homewards to see the cathedral at Llandaff, which was just then emerging from the condition of ruin and spoliation in which it had lain, in picturesque confusion, ever since Mr. Wood's unfortunate effort to convert it into the semblance of one of his favourite assembly-rooms of his own town of Bath had happily been but partially carried out. I was then courteously shown over the works in progress by Mr. John Prichard, the diocesan architect, under whose immediate charge they were. Shortly afterwards I received an invitation from that gentleman to join him in partnership, an offer which I accepted, and this led to my going down to reside with him at Llandaff. The cathedral of that little city (which is in fact only a suburban village in the neighbourhood of the town of Cardiff), with its lovely and refined Early English proportions and detail, thus became my constant study and source of inspiration. Its beautiful western front in particular, the exterior and interior of which form two distinct compositions in perfect harmony the one with the other, roofless and festooned with ivy when I first knew it, seemed, as it still seems, to me to be a model for graceful proportion and refined treatment of mouldings. I quite revelled in its loveliness, thinking it to be one of the choicest examples of that style which England has made specially its own, and of which it may be fairly more proud than of any of the others which it shares in common with other countries of Christendom. The carved foliage of the interior of the cathedral was to me a continual source of delight. It is most

* From a paper by Mr. J. P. Seddon, read before the Architectural Association on the 24th ult., as elsewhere mentioned.

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sparingly used, as if it were jewel-work; and indeed it is as precious as if it were so. It is of the finest type of Early English foliage, the flow of the lines of which have remarkable grace and freedom; the stems are clear and vigorous, and the trefoil-shaped leaves are excellent in outline and surface modelling. I sent up a collection of casts taken from them to the Architectural Museum, and there is nothing to my mind among their treasures to surpass or even to equal them. This carved foliage of Llandaff is, in my opinion, the perfection of that particular class of work which is seen in its very earliest stage, budding out as it were of the simple Norman cushionwork of the capitals of St. David's Cathedral, and which is to be found revelling in its richest and wildest profusion in that of Wells, but nowhere with such developed fulness and power, and yet with refinement and constraint, as at Llandaff. Very noticeable also are the simple but noble piers of the main arches, with their alternately wide chamfers and groups of triple shafts. The effect of these piers is not improved by the access of richness that is seen in those which have been imported into the church of Llanidloes, in Montgomeryshire, which has just been restored by Mr. Street. They were removed from the now destroyed but once marvellous Abbey of Curn Hir, in the same county, the number of arches in the main arcades of which are said to have reached the unprecedented number of twenty in succession. In these piers the tripled group of shafts occur on each face of their octagonal piers, and their capitals are all united in one rich band of foliage of the character of which we are speaking, but of inferior excellence to that of Llandaff.

The ordinary diocesan work, in which I became at once fully occupied, consisted largely of church restorations, and to my share fell principally those works which were situated in the archdeaconry of Monmouth, under the able and vigorous direction of its energetic archdeacon, whose habit it was to map out his district, and to appoint a visitation to various churches, the dilapidated condition of which required immediate attention, and to take me with him on those occasions. Upon our reaching one of these, possibly some few minutes later than it had been intended, he would first ask me to note its deplorable state, which I could not but admit was tolerably obvious. He would then inquire of me what could be done with it, premising, however, that there was no money to be found. To this problem I would reply that its solution and the course to be pursued were far less clear. Nothing daunted, he would then explain to the assembled vicar and churchwardens that he had brought me there simply in my capacity of diocesan architect; which meant that they might set their minds at ease, for the present at any rate, on the subject of fees; but that, as I happened to be there, I might as well take the plans and particulars of the church, so that, in case I should be sent for upon some future occasion, I might be prepared. He would then allot me about half an hour, proffering me his own assistance, when wanted, as a tape-holder. Under such pressure I soon learned to systematise proceedings, first sketching in succession the plans, elevations, sections and details, and then noting down the necessary dimensions; having done this, we proceeded to perform the same task at the next church upon our list. On my return home I plotted out these several sketches, and though, of course, when actual work was contemplated at any of these places, it became necessary, perhaps, to make another and more careful survey, much time had been saved, and the opportunity given for preliminary consultations.

There are now so many different theories on the subject of restoration that I cannot hope to have satisfied all. Mine, then, was to replace matters as nearly as possible as I found them; and I have considered it a compliment when I have been told, as I was by the late Sir John Harding, in connexion with the restoration of Rockfield Church, in Monmouthshire, that had he not been informed he should not have known that anything had been done to it. I was but recently told, however, by a zealous member of the Society for the Protection of Ancient Buildings, that I am only one of the more destructive members of my craft in consequence of the confusion thus wrought for future archæologists. There are, in truth, so many and grave questions that continually arise in dealing with old buildings, and so many ways in which each of these may be viewed, that an architect's position in relation to such matters is a difficult one. He has to decide what should be done, and that with the certainty that, whatever his decision may be, it will please few and be disputed by some. His only consolation is, that if his censors be asked how they would have acted under the circumstances, they would either have done nothing, which he was not in a position to do, or that each would have done something different to the rest; so that, therefore, their criticisms neutralise one another. In self-defence I can certainly aver that these village churches then stood, as it were, on their last legs, and that the newly-arisen zeal of the Church would not brook their total loss. After all, an architect is but the servant of the public, and though he may be able to (and, if so, should) influence the opinion of his employers, he is bound to defer to that in the end.*

CORNISH CHURCHES.

ST. PAUL'S ECCLESIOLOGICAL SOCIETY.

AT the meeting of St. Paul's Ecclesiological Society, on the 22nd ult., the Rev. H. C. Shuttleworth, M.A., Minor Canon of St. Paul's, read an extremely interesting paper (full of quaint legends and amusing stories), entitled "Stray Notes on some of the Churches of Cornwall." A supplementary paper on the same subject was also read by Mr. J. D. Sedding, architect. We print the substance of both papers.

Canon Shuttleworth observed that generally speaking, the churches of Cornwall were not rich in architectural beauty. The county had always been poor and sparsely populated, and the fierce Atlantic gales, impregnated with salt, swept over the hills and up the narrow valleys with a force which demanded solidity and strength on the part of the buildings, rather than elaborate ornament. The native stone, moreover, was mainly slate and granite, neither of which lent itself very readily to decorative treatment. It was somewhat strange that the beautiful Serpentine stone of the Lizard district had not been more largely used for ornamental work inside the churches of the county. Some kinds of the native granite, also, if sufficient skill and expense were forthcoming, could be worked up into very handsome decoration. The Cornish churches were all of the same character; with few exceptions they were uniformly low, rather flat in the pitch of the roof, and without buttresses, thus giving an effect of long plain lines. Chancels were not the general rule; the larger churches had a nave and one aisle, equal in length, with perhaps a transept, and always a porch on the south side. Almost all of the Cornish churches were rebuilt in the fifteenth century, when a great wave of church building seemed to have passed over the county; and almost all of them, therefore, had the same general features, of which those of the Church of Egloshayle might be taken as examples. The west portion of the nave was evidently the original church, and the north wall contained much of the old work, including two beautiful Early English lancet windows of two lights. The remainder of the nave, the south aisle, with its long array of windows, and the tower, were of the date of the re-building, and were therefore Perpendicular in style. The transept would seem to have been left unfinished, and was probably treated by another and a later hand, for it proclaimed itself debased. Egloshayle Church,—the dedication was lost, but the name signified "the church by the river or estuary,"—was remarkable as possessing a very fine old stone pulpit, probably the gift of a certain munificent vicar named Loveybond, who built the noble tower at his own cost, and the bridge from which the neighbouring town had its name. In this it was unlike its neighbours, but like them in the long row of granite pillars and arches between nave and aisle, the granite mullions of the many large windows, and the magnificent tower-arch looking up the long vista of the nave. This was the usual type of Cornish churches of the smaller kind; the larger had two aisles along the whole length of the nave, of which Bodmin and St. Kew,—the latter church having a structural chancel,—might serve as examples. In common with most others, Egloshayle Church had a wagon or cradle roof to nave and aisle, with bosses curiously and richly carved. The roof of the nave, however, was found to be so rotten when the church was restored a few years ago, that an open wooden roof was substituted. The old wagon-roof remains, however, in the south aisle. Indeed, the Cornish churches must at one time have possessed rare store of finely-carved wood-work. The bench-ends of the old seats in this church were covered with singularly-bold carving, in what an experienced London worker in old oak declared were the finest pieces of wood that had passed through his hands. There were also abundant remains of old screen-work, some of it very rich and good. But, alas! much of this kind of work, here and elsewhere in the county, had disappeared under the despoiling hand of the churchwarden of old. It was no uncommon thing to find farm-buildings repaired, and even pigsties patched, with fragments of old oak carving, upon which, in centuries gone by, some cunning workman had lavished his consecrated skill, for the glory of God. Most Cornish churches possessed towers, of a plain and massive character. The tower of Egloshayle Church was very lofty, from the fact that it stands in a valley, or "bottom," as Cornishmen said. Churches built upon the bleak hills had their towers necessarily low, and of great strength and thickness. On the north coast of the county, upon which the Atlantic gales broke with all their force, a line of church towers, like a row of grey weather-beaten watchers, stood along the loftiest and most seaward range of hills, looking over the ocean on one side and the outspread western county on the other. They still served the purpose for which, probably, they were erected there,—that of acting as landmarks and beacons to passing ships. Spires were rare in Cornwall, and when they did occur, it was always near the coast. A few of the churches of the county had no towers of their own, but only a detached bell-tower on the nearest hill. Mylor, a church near Falmouth, was an example in point, and, like every other church which possessed this feature, it stood in the bottom of a valley. A very few of the Cornish towers were rich in design and ornament: that of Truro, for example, and the far-famed tower of Probus, not far off it. This tower was very like that of Magdalen College, Oxford, and of almost equal beauty. Its style was the purest and most perfect Late Perpendicular, though it was built in the reign of Elizabeth. It was 125 ft. high, of granite, carved in every part. Such were some of the most marked general characteristic features of the Cornish churches, most of them resulting from the climate, the position of the county, and the character of the local stone and wood. If, so far, nothing very unusual had been touched upon, it was right to say that Cornwall did possess some few ecclesiastical buildings and remains which were highly unusual, and even unique; for example, only in Cornwall, so far as the lecturer knew, could be found authentic remains of the very earliest period of church architecture in England. The western county was evangelised in the fifth, sixth, and seventh centuries after Christ by Irish missionaries. They landed on the northern coast, chose their vantage-ground, and there built themselves a cell and an oratory hard by. The tiny oratory became a church, in which the remains of the missionary were usually buried. One, at least, of these ancient oratories still existed, though, unhappily, in ruins,—the Church of St. Piran, at Perranzabuloe, about eight miles from Truro. This church was buried for ten centuries under the shifting sand, and had only lately been exposed to view,—and to destruction, for the hand of man had been more unsparing than the sand, and the little building had been despoiled and mutilated, until it became a disappointment and a sorrow to see it. Piran was consecrated by St. Patrick,—so ran the tradition,—at the end of the fourth century, the saint having crossed the Irish Channel on a millstone, and landed near St. Ives. At some unknown date St. Piran's Church was submerged by the shifting sand, and lost to human sight. Another church was built, as near as possible to St. Piran's grave, and care was taken to choose the site upon a spot where a stream of running water formed an insurmountable barrier to the advancing sand. This second church was rebuilt during the great era of church-building in Cornwall (the fifteenth century), and the tradition of the buried sanctuary had never been lost. The guardian stream, however, was diverted by

* To be continued. See p. 727, &c., present number, for some of the drawings, with particulars, used to illustrate the paper.

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some mining works, and Borlase, writing in the last century, said then that the church was in no small danger from the insatiable sand. In 1803 it was dismantled, partly taken down, and a new church built two miles away. Thirty-two years later the sand shifted once again, and the old oratory, buried for 1,000 years, came to light again. It lies due east and west, and it is 29 ft. long by 16 ft. 6 in. broad. The entrance was on the south side, through a small arched doorway of the rudest construction, with a curious moulding above, of a character probably older than either Norman or Saxon work. Three heads, roughly carved in stone, found above the moulding, were now in the Truro Museum, but they were said to be much later in date than the rest of the building. The floor was below the level of the ground outside, and was reached by three steps. A window flanked the south door; over the altar was a rude east window. The stones used in the construction were slate and granite; no lime had been used, but sand and native china clay. The floor was of concrete. The stone altar-slab was still in its place, and beneath it it were found three skeletons. The lecturer said he was ashamed to say that the British Philistine had chipped, hacked, and stolen from this time-honoured relic. The most remarkable of the remains were now in the Truro Museum. With St. Piran's Church might be compared the Chapel of St. Enedoc, in the parish of St. Minver. "St. Enedoc" was probably a corruption of St. Guinedoc, and, oddly enough, the popular name of "Sinkineddy" had preserved the true etymology. Like St. Piran's, this little church was built in the sand-hills, about 1430, when it took the place of an ancient oratory, traces of which appeared in 1822 through the shifting of the sands. The lecturer remembered St. Enedoc in its unrestored condition, when the sand was higher than the roof of the chapel, but now it had been well restored, and the shifting of the sand prevented by the planting of grass and reeds. It had a Norman font, also the base of a fine carved oak screen of Third Pointed work. Besides these ancient oratories, Cornwall possessed unique ecclesiastical remains in the wealth of wayside crosses, which stood in all manner of places,—in churchyards, by the roadside, at the meeting of many ways, on lonely and untrodden moors and hills. Many were doubtless still in their original sites, where they were raised to fix the boundaries of church property, to guide the wayfarer to church or religious house, or to mark the scene of some memorable event, some sanguinary slaughter, or of some missionary's preaching of the gospel of love and peace. They were older, for the most part, than Athelstan's conquest of Cornwall in 936. Almost all were of granite, but they varied *ad infinitum* in size and shape. One type was that of the Greek cross,—four short limbs of equal length, sometimes carved on a circular disc, sometimes with the spaces between the arms pierced with holes. Near the Land's End, the crosses were raised on steps, and often sculptured with a rude figure of the crucified. In the east of Cornwall they were usually very high, enriched with scroll-work and mouldings on the shaft. Resuming his remarks on the churches of the county, the lecturer observed that St. Germans Church was of high interest, as the ancient seat of the Cornish bishopric from the time when it was established under Athelstan. The church is situated in the park of the Earl of St. Germans, Port Eliot, and has the unusual feature of two western towers, overgrown with ivy and fern. There is a nave and a south aisle, and the church had formerly a chancel, which fell, with part of the nave, in 1792, when the north aisle was taken down. Between the towers is a deep central doorway of Late Norman type, richly ornamented. The north tower is Norman in the two lower stages, but the upper stage, which is octagonal, and rather recalls the lantern of Ely, is Early English. The south tower is Norman below and Perpendicular above, and the church has further Norman remains in the font and two piers of the nave. The remainder of the nave is Early Perpendicular, and has a very fine east window of five lights. Between this and the east window of the south aisle is a striking feature which is called the bishop's throne, but which, in all likelihood, was merely a niche for a saint's image. This church has much interesting old carving, in particular, a *miserere* stall representing a man carrying a hare on a stick over his shoulders, with dogs in couples,—said to be oldest piece of carving in the West. Passing from St. Germans to Bodmin,—from the old cathedral to that which had claimed to be the new one,—the lecturer remarked that Bodmin Church was the largest in Cornwall. Notwithstanding this, and that Bodmin was supposed to be the county town, it was matter of congratulation that Truro had been fixed upon as the seat of the new see, for a more dead-alive place than Bodmin could nowhere be found, as might be inferred from the old Cornish saying,—"Into Bodmin and out of the world." Bodmin Church, dedicated to St. Petrock, was thought by some to be monastic and parochial, but Sir John Maclean maintained, with good show of reason, that the priory church was distinct. Among other churches referred to by the lecturer were St. Niot's, near Liskeard, with its interesting series of old windows; Temple Church, extra-parochial, formerly a chapel of the Templars, and latterly known as the "Gretna Green of England"; St. Columb, a large and beautiful Early Decorated structure; Mawgan, with its fine Perpendicular tower and early brasses; and Forrabury, with its remains of Saxon work.

Mr. Sedding, in his paper, said,—Cornish churches are what outsiders would call "mean" edifices. They are of small proportions, and low, and very much like one another, and they would be generally considered to be deficient in architectural interest, both on account of similarity of type and detail. There are many points of similarity between the churches of Devon and Cornwall, and as Devonshire churches partake of many of the characteristics of Somersetshire churches we may say that so far as the *genus* is concerned, the work of the three counties is allied. But if they had to be classified in order of architectural merit, they would have to stand thus: Cornwall good, Devon better, Somerset best. Devon echoes Somerset; Cornwall echoes Devon. Cradle-roofs abound in all three counties. In Cornwall there is no other type of roof. In Devonshire the generality are of that type. In Somerset there are a great number of that type, but a great variety of other types also. So, there is the same peculiarity of aisles continued to full extent of the chancel, the aisles having pitched roofs of the same description as the nave, but somewhat smaller. This accounts for the absence of clearstory windows: I know of only Callington, Lostwithiel, Fowey, and North Petherwin. Again, in Devon and Cornwall there is an absence of any architectural distinction or break at the chancel. I know of only three cases with chancel arches, at Tavistock, Bodmin, and North-hill (and the latter was removed about fifty years ago for safety's sake, but responds of the corresponding arch in the north arch are still visible). In each case the responds to arches die up near the roof, while the arches themselves are scarcely visible, as they almost merge in the roofs. I have said that the architecture of the three western counties is of the same genus, but it would be wrong to suppose that the work of each county had not its own peculiarities and distinctive characteristics. Any one familiar with them soon finds these differences out, and is able to mark how strongly local types and local tricks of method prevail. Cornwall is a remote place, and remoteness in the Middle Ages implied inaccessibility. It was not only remote, but it was little known and visited, for it is strange to note how few large Mediæval houses of any pretensions exist in the county. This remoteness and isolation were, of course, favourable to the growth of individuality of character. The builders had no one to please but themselves, and as neither the coach nor the railway was running then, there was little chance of their traditional types being interfered with, or of their seeing work in other parts of England which would put them out of conceit with their own. The earlier periods of Mediæval architecture are but sparsely illustrated. The remains of Norman work are not numerous. There are two bays of a Norman arcade at Lelant; there are also portions of Norman arcades at St. Germans, North Petherwin, and St. Breward; and other Norman remains at Manaccan, St. Cleer, Tintagel, Mylor, and Landwednack. Early English work is rare. St. Anthony's, near Falmouth, is said to be the best example. I have met with several cases, such as St. Levan, Newlyn East, and St. Wendron, where one or more of the transepts of a thirteenth-century church have been left standing, whilst the rest of the structure was destroyed by builders of a later date. The Decorated work which remains is of a high character, as at South Hill, Sheviocke, St. Ives, near Liskeard, North Hill, St. Thomas's Chapel at Bodmin, St. Columb, St. Austell, and Lostwithiel. The stone employed in work of early date is Polyphant or Cataclose stone. The prevailing type of the architecture of Cornwall is of various stages of the fifteenth century. One of the most interesting phases of Cornish work is that which was done in the early part of the sixteenth century. This period is represented at the Church of St. Mary Magdalen, Launceston, and at St. Mary's, Truro, which are remarkable for their elaborate external panelling,—that at the former is done in granite, and that at the latter in Pentuan stone. The tower at Probus, which is, without exception, the finest in Cornwall, is also of this date (1530). Its rival for eminence is Fowey, 100 ft. high. Probus is 125 ft. high, and infinitely more elaborate, and it is interesting to note how closely it resembles a Somersetshire type. In the churches of Perpendicular date granite is, almost without exception, employed for window tracery; and in the later work, where dignity of effect was considered, and funds and stone plentiful, the structures were faced with wrought stone entirely, as at Probus Tower, North Hill (south aisle), and the Launceston and Truro churches, which are covered over with sculptured devices. To the sixteenth century is also to be ascribed the noble series of stained-glass windows at St. Niot's, which dates from 1528. To the sixteenth century is due also most of the fine woodwork in the county, as the seats at Altarnum, St. Levan, Morwenstow, and in the Buryan, Sancreed, and other screens. The peculiarity of Cornish wood-work is in the profuseness of its surface ornament. There is nothing like it out of the county, anywhere, to my knowledge, except the superb screen at Swymbridge, North Devon. Ordinarily the panels of even the most ornate screens in other counties will have traceried heads, but plain panels. Here the panels are all covered with sculptured devices,—sometimes of foliage alone, of great varieties of type,—growing mostly out of quaint little pots; or foliage mixed with birds or beasts, tortured griffins, and all manner of queer imaginative creatures and religious emblems, and here and there figures of men or angels,—and not only respectable men and men of high degree and the patrons of the church, but in some cases the village clown, the squire's tame bear, and the "passen's" pig. And many is the caricature of Tom, Dick, or Harry, and many the piece of friendly fun or naughty spite that appears in these carvings, which testify to the deft handiwork and keen humour and quaint imaginations of the Cornish craftsmen of by-gone days. The history of the grotesque in Cornish art ought certainly to be written. I have often tried to analyse for myself the sources of the peculiar delight one gets from an old Cornish church, but as often as I have tried I have given it up. One cannot put that sort of thing into words. There is, as I have said, very little to admire in the rough exterior of the churches of the county, or in their unvaried outlines, or their unpretending features, and little variety of plan and type; and the unsympathetic stranger, coming upon them with his mind stored with taller memories, would think them mean and rude and deficient in interest. Yet to me they are always full of a peculiar, inexpressible charm. Somehow they seem more identified with the local surroundings than is the case with the church architecture in other parts of England,—possibly because the surroundings are themselves usually of so striking a character, and because their builders actually, in many cases, merged the churches into the hill sides by building them "into the country," as the Cornish folk say. But these simple structures seem somehow to be part of the simple Nature of the moor and down which surround them; they have what painters call "quality" or tone in them; they are essentially human, and eloquent of the character of the men who reared them, and they are full of the silent poetry of an art that was religious and human, and that dedicated its best to the service of the great God.

A brief discussion ensued, in which the Chairman (the Rev. Dr. Sparrow Simpson) and Messrs. Somers Clarke, S. W. Kershaw, the Rev. Mr. Acland, and Major Heales took part, the thanks of the meeting being heartily accorded to Canon Shuttleworth and Mr. Sedding for their papers.

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DAMP WALLS.

IN a recent issue of the *Badische Gewerbe-Zeitung* appears an article on this subject, the importance of which induces us to reproduce it in our columns, with such additions and remarks as seem to us desirable. The writer, Professor Meidinger, observes that, if in an old house wall-paper turns mouldy and peels off, the cause is dampness in the walls. The walls of an old house may turn damp from various causes:—

1. The rain sickers through a defective roof into the wall, or it penetrates a badly-pointed wall.

2. In the cold season vapour produced from special causes is deposited on cold walls.

3. The wall contains aphronitre (nitrate of lime. Chloride of calcium, which occurs less frequently, displays the same behaviour; quarry-stones which remain wet contain probably one of these salts). The wetting of walls in consequence of the presence of hygroscopic salts is caused only rarely by the formation of saltpetre; most frequently sulphates of sodium, and especially of magnesia, show themselves, which are contained either in the mortar or in the bricks. Mortar of dolomitic limestone, which has been burned with fuel containing sulphur, especially has caused very frequently to the formation of wet places. Even the presence of sulphuric acid in a damp atmosphere, in districts where much coal is consumed, has given rise to the formation of sulphate of magnesia in quarry-stones, and consequent damp walls, as was proved some time ago in London on façades of limestone containing magnesia (Portland stone).

4. The underground water reaches so high that it rises in the wall of the basement.

5. The house is built on a slope, so that the rain-water running down enters the wall of the basement.

Firstly. The cause of the dampness named first may be removed by repairing the roof, or by repointing the wall. A coating with oil paint of the outer face of the wall may also be recommended in certain cases. If the outer walls consist of timber and bricks, which cannot be joined closely, the method adopted, especially in mountainous districts, is very serviceable; that is to say, of covering in the walls of the weather-side with boards or shingles, and for greater durability painting the latter in oil. On the Lower Rhine, slate, as used for roofs, is also employed. A cover with metallic slates is likewise to be recommended, and quite recently pressed plates have been used which have the character of shingles. All perfectly water-tight coatings and coverings on vertical surfaces of course keep off driving rains, and prevent the accumulation of dust and the growth of moss and lichen; but they form, at the same time, an impermeable layer, arresting ventilation through the walls, on which account they may prove injurious to health, under certain conditions, in overcrowded houses not provided with artificial ventilation. The duration of such coatings and coverings likewise is not very great, for oil varnish becomes gradually humid, liable to form emulsions with water, and, when in that state, persistently retains damp, which penetrates also into the interior of the wall. It is evident that walls already damp cannot be dried by such means; that, on the contrary, their drying is prevented. On the other hand, the shingle walls in use in Switzerland, or the protective walls of Solingen plates employed in the country along the Weser, and the plates used on the Rauhe Alb in Würtemberg, besides the slate coverings, are quite to the purpose.

Secondly. The precipitation of damp and water on cold walls is observed principally in kitchens and in large rooms filled on occasions by large assemblages. In the former case, the deposition of damp arises from the steam generated in cooking; in the latter, it is caused by the breath of the people collected together. If the walls are painted with oil colour, drops of water are formed which collect on the walls, and in some cases even wet the floor. If the walls are coated with size-colour, the water penetrates and makes them darker; as soon as the generation of steam is arrested for a time, they become perfectly dry again. If the walls are papered, the paper-hangings become wet and dark, to dry, however, again very soon and completely. The paper does not turn mouldy, but the paste will probably be destroyed in course of time, and the paper itself discoloured. Under such conditions, the outer walls are chiefly exposed to the precipitation of water, especially if they are built of quarry-stones, which are good conductors of heat. Brick walls are less exposed to such a deposition, and walls of tufa and wood not at all. If it is intended to protect an outer wall exposed to such precipitations, the simplest way is to board it. The boards, of a thickness of 0·4 in., are nailed to flat beading ¾ in. to 1·1 in. thick, and secured with holdfasts to the wall, the intervening space being filled with straw. Thus a very bad conductor of heat is placed nearest the wall, upon which water will not be deposited. The warming of the room is also greatly facilitated by this means; for this reason, such a covering may be recommended in many cases, but especially for north or east walls, and more particularly for bedrooms. The boards are either covered with shirting, upon which the paper may be hung, or they are nailed with reeds (much used in place of laths in Germany) and plastered with gypsum, after which the wall may be treated in any manner desired. The cost of such a boarding is in Germany about 1s. per square yard, the shirting 7d., the reed and gypsum coating 1s. 5d.

Thirdly. Aphronitre is most frequently the cause of permanently wet walls, or such as become always wet in damp weather. It is observed principally in the lower stories. Its origin is due to organic substances containing nitrogen, especially exhalations of man and animals, which lodge in the walls and form nitric acid during their decomposition; the latter, in combining with lime, forms nitrate of lime. Its appearance is therefore most frequently met with in water-closets, in stables, and in the country very often on walls near accumulations of liquid manure. Nitrate of lime is a soluble salt (it is hygroscopic); that is, it absorbs water from the atmosphere, more or less according to the humidity of the air. In dry weather part of the water absorbed during damp weather passes back into the atmosphere. If a wall contains little saltpetre, it becomes light in colour and dries in dry weather; during damp weather, on the contrary, it turns dark and wet. Should the wall contain much saltpetre, the wall is permanently wet, as in stables. Paperhangings on a wall containing saltpetre appear dark during damp weather, and may easily be pulled off. The paste, kept damp for some time, gradually decomposes, and thus loses its adhesive property, the paper hangs loosely even in dry weather, and is held in its place only at the permanently dry spots. The adhesive ingredients of colours are likewise destroyed, the colours fall off as dust, mould is formed, and the whole appearance is totally deteriorated. The aphronitre possesses the property of spreading to a certain distance from the spot where it originates over the porous wall, through stone and mortar. It thus penetrates the whole thickness of the wall, and arrives, although generally found only on one side, at the other surface of the wall. Quite apart from its ugly appearance, a damp wall possesses other disagreeable properties. The adhesive ingredients of paper and colour develop an unpleasant odour during their decomposition; the same is observed in mouldy paperhangings, and in the timber in contact with damp walls. Effects injurious to health have consequently been often attributed to damp walls, although it would be difficult to prove such an assertion. Various means have been proposed for preventing damp in walls from aphronitre, or at least obviating the disagreeable consequences attendant upon its formation. We select some of the principal means suggested.

(*a.*) The evil cannot be remedied by simply removing the mortar coating, as far as it shows damp, even between the stones, and subsequent fresh plastering. After the mortar has become thoroughly hardened and dry, the wet places appear again after a little time during damp weather, although not quite so large as before. The saltpetre still in and between the stones gradually penetrates part of the new plaster, until it shows itself on the outside. There is no doubt that, even after removing this second plastering and putting on a third, the latter would show wet places, although of smaller dimensions. It might be possible to gradually extract the whole saltpetre from the wall, just as it is possible to remove oil spots from wood by repeated applications of wet pipe-clay. This method of drying a damp wall,—although it would effect a radical cure, as long as no fresh formation of saltpetre takes place, and although it would be most advisable from a sanitary point of view,—will not find much favour, on account of its inconvenience, tediousness, and expense. In the rare cases where actual formation of saltpetre is the cause of the dampness in walls, in stables, and closets, a coating of dolomite cement, to which some phosphate of magnesia has been added, has proved a very efficient means for preventing the further formation of saltpetre. As the formation of ammonia always precedes that of nitric acid, the ammonia combines rapidly with the magnesia contained in the mortar to insoluble phosphate of ammonia-magnesia, and the carbonic acid of the decomposing urine contained in the ammonia with the lime to carbonate of lime. As it is, the not inconsiderable quantity of phosphoric acid contained in urine by itself causes the formation of the insoluble magnesia combination.

(*b.*) It is stated by practical builders that half cement mortar, that is, ordinary lime mortar mixed with the same quantity of Portland cement, is the best means for drying the walls of water-closets; no penetration of damp has been observed several years after the new coating has been applied. In Germany, instead of ordinary Portland cement, Erdmenger's Portland cement of dolomite is considered the most suitable for the purpose.

(*c.*) For some time past it has been tried to prevent the penetration of the saltpetre still remaining in the stoves into the fresh plaster by coating the stones and the joints between them with an isolating layer impenetrable by water. Asphalte, either by itself or mixed with linseed oil, has been used; pitch, common rosin, and tar have likewise been recommended, the latter, however, less, on account of its liquid state and its powerful smell. The mass must be melted, and applied hot with a brush. It is imperative that the surface of the stones be completely covered, and the joints between them perfectly closed up; the saltpetre will percolate through the smallest crack, and thus produce wet places on the wall. Before applying the isolating layer, the room must be artificially and very highly heated for several days, to make sure that the exposed stones and joints have been perfectly dried. The asphalte or its mixture with linseed oil must penetrate to a certain extent into the stones to ensure a perfect adhesion; this is not possible if the stones are damp. Small places may also be warmed and dried by holding a charcoal pan close to them. Timber which may be in the damp wall must be treated in the same way; in this case it would be advisable to remove the stonework round the piece of timber as far as it shows damp, to dry the latter well, and then coat it on all sides with asphalte. Upon this isolating layer, which should be from 0·2 in. to 0·4 in. thick without interruption, after hardening, ordinary plaster or gypsum is applied. In carrying out the above, the plaster should be removed, not simply where wet places show themselves, but from 1 ft. to 2 ft. round them, the isolating mass being applied to the same extent, so as to prevent the saltpetre from penetrating sideways and causing damp spots round the edge of the new plaster. It is not to be expected that the latter should combine closely with the isolating mass; it receives its support sideways from the old plaster still sound. This would be no objection where only small patches of plaster had to be renewed; but large wall spaces would sound hollow, and probably might become detached unless a close junction of the plaster with the stones were effected by driving in here and there holdfasts coated with asphalte, before the plaster is put on. A putty of asphalte and mastic, also, was successfully employed at the Allgemeine Hospital of Vienna.

(*d.*) A few years ago tinfoil was recommended as an isolating material. It was put on the wall with paste, after every vestige of the old paper had been removed, the fresh wall-paper being then put on the tinfoil. Although the latter is very cheap (the cost of pure tinfoil in Germany is only 3s. 7d. per kilogramme, or 1s. 9d. per lb., with which quantity a space of about 12 square yards may be covered), and the process is very simple. It was soon found that it cannot be put on a damp wall, on account of the paste decomposing. It was next tried to secure the tinfoil with tacks, but the latter soon began to rust; tin tacks might perhaps be more suitable. No case has been recorded in which tinfoil has been pasted upon a wall previously well dried either by natural means or artificial heat. If the wet places are not too large, it might be

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advisable to paste the tinfoil first on the paper, and, after drying, to put the paper on the wall, care being taken to use paste only for the part of the paper free from tinfoil. The paper would thus lie hollow against the wet place on the wall, where the tinfoil acts as a protector against damp. Lead-foil, in place of tinfoil, is not to be recommended, as lead is attacked by damp saltpetre.

(*e.*) Asphalte paper has sometimes been nailed on damp walls; but in such cases a covering of shirting is necessary for receiving the wall-paper. The cost in Germany is about 10d. per square yard. The protection, however, is not permanent, for the asphalte paper lasts only a few years.

(*f.*) There is no record as to the effect of painting damp-walls, but it is well known that such a coating after some time blisters and finally peels off. It would be worth while to examine more closely into the question whether this always takes place, or only under certain conditions. It is thought that several coatings of paint put on a wall well dried by artificial means would penetrate the same, and unite so closely with the plaster as to prevent a peeling off taking place. Three coats of paint would in this case cost about 9d. per square yard. The paper would have to be put on before the last coat of paint is thoroughly dry, as otherwise the paper would not stick.

(*g.*) If wet places in walls assume large dimensions, it is recommended to face the wall with a brick (or tufa stone) wall or boards. The first is expensive and takes up room; joints with the old wall must be made with asphalted bricks to prevent a transmission of saltpetre. The second remedy is that to be adopted in most cases. The process is similar to that applied in boarding walls outside; filling in with straw, however, is omitted. For greater protection, the boards, as well as the beading fastened against the wall, are coated with silicate paint. Such a coating on both sides of the boards costs about 2¼d. a square yard. The whole expense for fixing such a boarding, including the covering with shirting, but excluding the wall paper, is at most 2s. per square yard. It appears unnecessary to the author to provide for ventilation between the boarding and the wall by leaving openings at top and bottom, as it is not intended to dry the wall. A consequence of induced ventilation would be simply to cause the covered wall to absorb more or less moisture according to the state of the atmosphere, just as if the boarding had not been put, while with sluggish circulation the wall gets damp and dries more slowly, it being impossible to cut off the access of air entirely. By others, the necessity of thorough ventilation between wall and boarding is insisted on, it being pointed out that rapid circulation must tend to decrease dampness and at the same time prevent the otherwise inevitable formation of mould or fungus in the boards.

(*h.*) Quite recently, wood hangings have been introduced in Germany, serving as isolating layer between ordinary wall-paper and damp walls. These hangings are made in the form of webs or wickerwork of strips of wood or shavings of North Swedish or Finnish pine, 0·04 in. thick, and 1·17 in. to 1·56 in. wide, which are said to resist the effects of damp for a number of years. They are manufactured in lengths of 22 to 33 yards, of a width of 2 ft. 6 in. to 5 ft., and sold at 1s. 4d. per square yard. The wood hangings are fastened to the wall with galvanised nails, the nail-heads being covered with pieces of shavings slipped in, at a cost of about 6d. per square yard. A covering of shirting is also in this case applied before putting on the wall-paper. This wickerwork may be directly used for panelling; the panels are produced by beading, and by leaving the whole in that state, or applying coatings of varnish, or painting the several stripes with various oil colours. Patterns may in this manner be made at a cost of 6d. per square yard; one coating of varnish, at 2½d.; of oil-paint, at 6d. to 1s.

Fourthly. When underground water is the cause of dampness in walls, aphronitre, as a rule, always co-operates. Water alone does not rise so high, as we know from the behaviour of cellars, the sole of which very often is only just above the level of underground water, and the walls of which are nevertheless quite dry. The same means of prevention as above mentioned may be employed; they are, however, only palliatives, which do not dry a damp wall. A radical cure may be effected only either by a perfect isolation of the wall from the source of damp,—which may be done in existing walls by draining at intervals, and isolating from the ground below by the insertion of sheets of asphalte felt,—or by completely eradicating the damp from the wall. This may be done by stamping in between the damp wall, which must be previously stripped of its plaster, and a provisional planking, a layer, about 2 in. in thickness, of fresh quicklime powder. For outside walls the planking may be dispensed with; all that need be done is to dig a trench along the foundation, and fill it with lime. The damp may also be got rid of by heating the rooms with coal-baskets, and by drawing the heated air from the interior by means of a suction-pump connected with a box provided with india-rubber packing, which is pressed against the other side of the wall.

Fifthly. When a building is erected on a slope, and the higher wall becomes saturated with percolating rain-water, a cure can only be effected by cutting a deep trench, and thus draining off the water. If substances containing nitrogen and conducing to the formation of saltpetre have been introduced into the wall through rain, the latter will continue to be damp, and the only palliatives against their injurious effects on the inside faces of walls are those already pointed out.

Since the above was written, the *Badische Gewerbe-Zeitung* has published a few additional remarks by Dr. Meidinger. It is stated that in several cases of dampness in walls a coating of oil-paint, upon which subsequently tinfoil has been pasted, has been found efficient. The two substances combine very closely, and permit of the hanging of paper afterwards. The paint must, however, be put on only in dry weather, or after artificial drying of the wall, and the wet places have entirely disappeared. With regard to boarding of damp walls, it is added that it should not be neglected to asphalte the beading to which the boards are nailed, to protect them against the absorption of water and consequent destruction. Moreover, the boards must not be too far away from the wall, on account of mice. The introduction of air-holes is also to be recommended, experience having shown that in their absence the wood becomes fusty. It has already been pointed out that it is advisable to coat the boards with silicate paint, to prevent rotting. This little extra expense should not be spared, for it is by no means yet proved whether air-holes alone will preserve the boarding; moreover, the introduction of openings for ventilation may be inconvenient. In any case, the naked boards must not touch the wet wall, as otherwise saltpetre would enter them and make them damp also. It would, perhaps, be advisable to remove the plaster wherever damp shows itself, before nailing down the boards. The wall would then absorb less moisture from the air, and would lose it quickly again in dry weather; under these conditions, the space between boards and wall would contain damp air for a shorter time, the presence of which is injurious in any case.

Finally, with respect to the introduction of an isolating layer between stones and mortar, we learn from a prospectus lately issued that a special putty, called Weissang joining putty, has been introduced in Germany which appears to answer the purpose well. The mass, of the nature of asphalte, but without smell, is boiled with an equal weight of linseed oil, and put on as hot as possible. It is stated that about 2 lb. of the mixture cover 1 square yard of wall space. The mass is sold retail in Germany at 1·80 mark per kilogramme (11d. per lb.). As the price of linseed oil there is about 6d. per lb., to coat 1 square yard would cost 1s. 5d. The mixture is applied in a peculiar manner. The wall is stripped of its plaster, the joints being picked out deeply. The latter are then freshly set with mortar. After drying, the hot mixture is put on, and the wall at once thinly rough-plastered. When the latter has dried, plastering is proceeded with as usual. Under these conditions, a close connexion of the plaster with the isolating mass is effected. The latter is recommended also for the protection of gable-walls on the weather side against the penetration of damp; as a substitute for reeds (laths) in plastering on wood; for painting timbers and ironwork in new buildings; for preventing the growth of fungus on wainscoting and other wooden linings; finally, for coating hoardings, garden-rails, barriers, posts, tree and vine stakes.

BARNSLEY AND ITS TRADE.

"Black Barnsley," as it has been often called, has of late years known such improvements that, if the uncomplimentary adjective be allowed, it must be qualified in the quotation, "Black, but comely." It is an ancient town, with fine surroundings, if the dark belt of collieries be pierced through, and its church, modernised and partly rebuilt as it has been, still carries the memory back to the days of the Fourth Henry. It is interesting to compare Barnsley now with what it was forty years ago. Forty years ago it held a court baron; a town-hall was being erected near the earliest church; the principal manufacture was linen, in which thousands of looms in and about the town were employed, whilst steel-wire, steam-engines, and other articles were amongst the productions of the town. In addition to the old church, there were St. George's, built by "grants from Parliamentary Commissioners," and six places of worship for various shades of nonconformity. The population at that time was 10,330 in the latest census return,—that of 1831. There was no railway; there were the Royal Mail, the Express, the Courier, the Amity, and other coaches; a car to Doncaster; Deacon & Co. were the chief of the carriers; and there was the conveyance by water of the Barnsley Canal Co. Nine bleachers were included in the lists of the trades, thirty-one linen manufacturers, and only five coal-masters and merchants, whilst there were also two iron-masters and merchants.

In the years that have passed there has been a large development of trade, of population, and of signs of progress. The population has been much more than doubled, the coal trade has known an enormous development, the introduction of more than one railway line into the town has given it an impetus, and whilst there have been terrible catastrophes in the district, and whilst some of the trades of the town have not known a corresponding development to that of fuel, there are very many and great signs of the material progress of the district, and at present many also of the material prosperity of the chief town also. A fine park was twenty-one years ago given to "bleak" Barnsley; the places of worship have been increased in number and increased also in attractiveness; the fine hall of the miners is in itself an ornament to the town, and, remembering those who have erected it, and its surroundings, it must be acknowledged to be in every way a mark of the appreciation that the working miners have of art, and an enduring tribute to the memory of some of their early leaders in the trade unions. The old and once narrow streets of the town have not been materially improved, but they have the advantage of having newer and nobler ones appended, whilst there has been a very general improvement of the architecture of many of the places of business in the old streets. And the signs of progress are far from being exhausted, for there are indications that a new era of improvement has begun, and that as the coal trade gives wealth to the town it will be in degree applied to its own beatification. For though some of the older trades remain, and one at least has known some extension in the forty years, it must be acknowledged that coal is king in Barnsley. Instead of three or four collieries there are now fifty-six at work in the Barnsley district, and though in the summer time the want of a demand for household coal makes itself felt from time to time, the wages and the yearly earnings of the miners will bear comparison with those of some districts that are perhaps better known in parts of the country. The visitor to Barnsley by the old route sees from the junction all the indications of a prevalence of the industry of King Coal. There are mines of great extent here and there; there are miners' cottages planted on many a slope; and through the streets and village and town at times the miners troop. Miles of sidings abut on the railways stocked with wagons of coal, and the names of some of the collieries are well known, if not their locality, to the coal-consumers of the metropolis. For a number of years that great industry has been deeply depressed, and that depression was reflected fully on Barnsley. Production of coal in many of the coal-yielding districts had been increased until the demand was more than met, and there was a consequential lying idle of some of the collieries

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and a serious reduction from time to time in the wages of the workmen. From this state of affairs the coal trade seems now to be slowly and steadily emerging. Demand is better, wages tend upwards, and the facilities of production are much more fully utilised,—though not perhaps to the entire extent possible. As they are so utilised more, the cost of production is increased because the cheapest-worked collieries are those that are wrought in the days of depression, and every addition to the demand draws in others that are not so cheaply worked. And this process has been going on for some months with the result that the price of coal has tended upwards, and with that price the tendency has been first to the fuller employment of the miner, and then to the increase of his wages. This is the cause of the benefit that Barnsley is receiving now, for higher wages mean to it a large circulation of money, and usually better returns for the tradesmen. We seem to have now entered into an era of better times for the coal trade, and in that era, to adopt the maxim of Scotland's great port, "Let Barnsley flourish," if in that prosperity it makes itself still more comely and removes some of the eyesores that still linger from the old days.

THE AMERICAN MOUND BUILDERS.

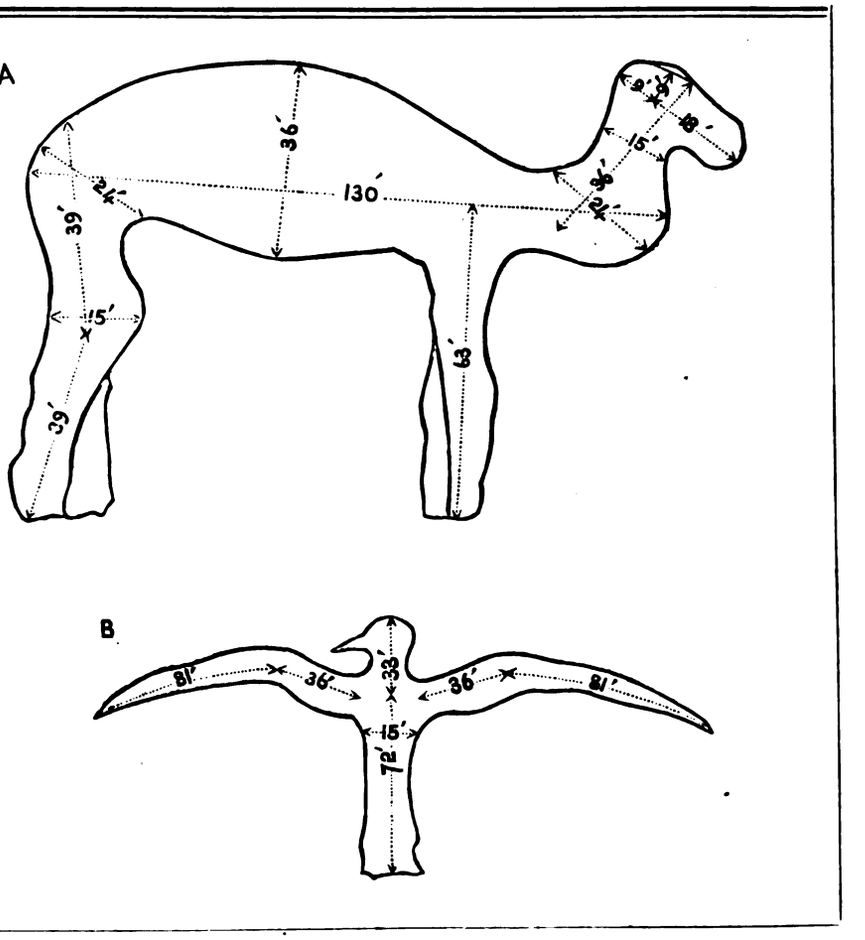
I HAVE, for some months, been making a careful investigation of the works of the American mound-builders along the whole course of their occupation. I was able to trace all those that have been published, notwithstanding that some have been much reduced by the plough. Many, however, and those the most interesting, I found nearly intact, from their being in remote districts and woods where they have never been under culture. Where towns and cities have been built, of course, not a few have been removed, as at St. Louis, Cincinnati, Marietta, &c., but these cities have still extensive works in their vicinities, which act as data to what have been lost. I have found many very curious mounds which are not described in the Smithsonian or other works, and they appear to me of great interest as affording some clue to the intent and objects that the constructors had in view.

From the lowness of the Mississippi and Wisconsin rivers, which have for some years past made the roads communicating with the adjacent localities impassable at this season, I have been able to complete the survey begun several years since by the late Mr. Strong, Civil Engineer to the U.S. Government, who was unfortunately drowned during his survey, which has, I am informed, never been completed, so far as archæological remains are concerned. From a large number of remarkable forms I have examined, I send you an extract from my note-book, giving, in one case, a well-defined mound of a form unlike any I have met with, published or unpublished; and in another, one of a continuous range of mounds of uniform appearance and clearly-expressed purpose.

A.—The first, which approaches the form of a camel more than of any other animal, though the length of the body is a variation from the perfect proportion otherwise uniformly executed by the constructors, singularly enough lies on the same terrace of the Mississippi levels as the well-known "Elephant Mound," which I also examined. One is to the north, the other to the south, of the Wisconsin river. The heads of both are in the same direction, *i.e*, with the course of the stream, southwards; and the ravine by which the upper levels of the country are approached from this spot is, and has from the first occupation by Europeans, been called "Camel Cooley," cooley being a local term for a ravine or gorge.

B.—The range of mounds (of one of which I inclose an outline) lies on a but-little-known track of the mound-builders between Lake Superior and the Wisconsin river. It consists of twelve enormous bird mounds, locally called eagles; they have a uniform position and definite purpose, as a deviation from their course would have involved death in such seasons of floods as have prevailed in the last few years, and which must have been more prevalent in former times. They are well defined even to the birds' beaks, which all lie in the same direction.

At the northern end of this range of mounds there is a remarkable notification of the twelve forms leading thence towards the Wisconsin river, which is unmistakable in meaning, and



which gives a clue to many other forms of mounds, and even to some characters in the Palenque pictorial alphabet: the details might occupy more space than you could give to this communication.

On the question of the "elephant mound," I may observe, in passing, that elephant figures occur in the Yucatan pictorial writings, and elephant forms, of perfect shape, are found in the museums, carved on the calumets or mound-builders' pipes, which I have seen; while there have been, almost monthly, during my visits to various States, discoveries of elephants' tusks and bones in a high state of preservation, though exposed in swamps to surface water and other destroying effects, tending to show that the elephant existed here during the mound-builders' occupation of this territory. The height of the mounds averages from 2 ft. to 3 ft. at the highest parts, and rises rather abruptly from the surface.

In the Government Geological Surveys of the United States I find the camel and elephant remains are found with the horse, of which I have also found several mounds; and in Bryant & Guy's "History of the United States," these remains, the elephant in particular, are described as found with evidences of human occupation.

This seems to show that though all were extinct on the coming of Europeans, these animals or their descendants might have existed with the mound-builders, as several varieties of each of the animals are described. The llama belonging to the camel species still exists in the South.

J. S. PHENÉ.

Houghton, Michigan, Lake Superior, U.S.A.

NOTES ON THE ISLE OF MAN.

A CONSIDERABLE amount of constructive activity is at present to be seen in the Isle of Man, and large sums of money are being spent upon the erection of additional harbour works, under the general superintendence of Mr. Walker, C.E., the resident engineer to the Harbour Commissioners. Touching, first of all, on this class of work, we find that at Ramsey, the chief town in the north of the island, which has long been in want of better landing accommodation and shelter for shipping, a sum of 31,000*l*. will be spent. At Peel, where the harbour has for some time been inadequate for the wants of the herring fleet when they are fishing from this place, 13,000*l*. is being expended on the inner works and 11,300*l*. on the outer works. At Port St. Mary, which is the chief port of the south part of the island, a breakwater is now being erected, for which 15,000*l*. has been voted by the insular Legislature. Should these works be successfully constructed, they will undoubtedly contribute to the material prosperity of the Isle of Man, as well as give employment during the winter season to many of the fishermen who, owing to the ill-success which attended them during last and the preceding seasons, have somewhat curtailed their fishing ventures. On the other hand, the breakwater which was erected at great pecuniary cost at Port Erin, and to the extreme detriment of the fine coast-scenery, has been a deplorable failure, and upon its repair more money has now to be spent. Nothing, in fact, could show more clearly how impossible it is to produce a frequented port by simply making harbour-works, if there is no natural influx of shipping. Sir John Coode's work at Port Erin may be said to have caused an absolute loss of 72,000*l*. to the Manx people.

Turning to what may be termed more strictly buildings, we find Peel Church in course of reconstruction and a keen contest being waged as to whether or not it shall be turned into a cathedral for the diocese of Sodor and Man. It is not for us to express opinions upon ecclesiastical questions, but we confess we should much prefer to see the parish churches of the Isle of Man made more architecturally beautiful than money expended on a cathedral establishment. A new church, for example, which was recently erected at Port Erin has neither tower nor spire, and so far from being an addition to the scenery is, if anything, a blot on the landscape. It is to be hoped that the new church at Port St. Mary, of which Messrs. Barry & Son, of Liverpool, are the architects, will serve as a model for future religious edifices in this island where architecture is at a low ebb. It would be difficult indeed to find anything more hideous than the houses which are erected for the accommodation of visitors; they are in the most debased style of suburban and watering-place architecture without individuality or beauty. At Port Erin, one of the most picturesque spots in the Isle of Man, with one of the most charming bays and views of coast scenery to be found near the coasts of England, lodging-houses are beginning to be erected which are positive eyesores. In the same way at Douglas many of the houses are of the most monotonous and spiritless character, quite unworthy of the really fine promenade which partially surrounds

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the bay. A new infirmary for King William's College should not be passed over without mention; it is being erected some hundreds of yards away from the school buildings, the governing body of which is thus carrying out a principle which should be acted on by the authorities of every large school, namely, to keep the buildings for the sick wholly separate from those for the healthy boys.

It is noticeable further how the small one-storied thatched cottages in this island are giving way to substantial two-storied buildings with good-sized windows. Nothing can be more satisfactory than to see houses of so improved a kind become general among the fishermen and peasants, and nothing can be a surer sign of material prosperity; but if architectural beauty were more sought after and esteemed in connexion with the larger houses in the Isle of Man, its position architecturally considered would be better than it is.

THE SOCIETY OF BRITISH ARTISTS.

THE present winter exhibition at Suffolk-street is rather a good one. In Mr. Howard Helmick, whom we have before noted as a rising painter of *genre*, the Society has acquired a valuable member, and his talents are well represented in the present exhibition. "The Legal Adviser" (22) is his best specimen in regard to the display of character in the figures, only two in number,—a widow and the lawyer, who is making himself as agreeable as he can to her; the smaller work, "The Poor Scholar" (277), is less interesting as regards the figure, but more complete as a whole, the accessories being numerous and well studied; in the former picture there is an effect of bareness on the canvas which gives the idea of an unfinished work. Mr. J. R. Reid, who seems also to have become a member, sends a large oil-sketch, rather than picture, called "The Plagues of the Village," which will be well worth working out into a picture. Mr. Arthur H. Marsh sends a single figure of a young woman carrying an immense bundle of nets on her back, under the title of "The Lass that Loves a Sailor" (267). Mr. Reid's "Reflections" (482), another broad and free sketch, in this case of a coast scene, should be looked at. Among the landscapes, "A Surrey Lane" (235) by Mr. T. J. Watson, is in a much finer and broader style than the majority of those exhibited. Mr. E. Ellis is very spirited in the movement and swing of his rough seas, of which there are various examples, mostly on a tolerably large scale, but they are mannered in colour, and it is not a very agreeable mannerism. Mr. Dendy Sadler, the painter of monks, exhibits a really clever and well-finished picture, "Habet!" (182), representing an interior with two ecclesiastical chess-players at the crisis of the game. Mr. Wyke Bayliss's "At the Cathedral Door" (352) is a nice architectural interior, savouring, however, a little more of the work of the architectural draughtsman or colourist than of the artist in the wider sense. There are various other works in figure-painting and landscape reaching a fair average of merit, and which will interest the "average" visitor; and there are some really pretty terra-cotta models on the centre table, by Mr. W. Merrett, Mr. Raemackers, Miss Barlow, and others. There is, of course, nearly the usual proportion of works which had better not have been painted at all, or, if painted, not exhibited. What can, however, be said is that the best paintings in the collection reach a higher standard than ordinarily.

SEWERAGE WORKS.

SHIRLEY AND FREEMANTLE SEWERAGE.

THE Local Board have adopted the recommendation of Mr. J. C. Melliss, C.E., of London, for the diposal of the sewage of their district, and have instructed him and Mr. Pim, C.E., of Southampton, to proceed with the necessary works.

The Proposed New Line to the City.—In a Bill to be brought forward next session for extending the powers of the Regent's Canal and City Railway Company, a clause is inserted empowering the Great Northern Railway Company to hold stock in and subscribe towards the undertaking, and to guarantee the payment of dividend or interest upon such capital.—*City Press.*

THE MOSQUE OF OMAR.

THE latest contribution to the literature dealing with the enigma of the origin of the celebrated Kubbet es Sachra, or Mosque of Omar, at Jerusalem, has just appeared in Germany, from the pen of Professor J. N. Sepp, who has long been favourably known for his researches among the monumental edifices of Palestine. The title of his new work, "The Rock Cupola, a Church to St. Sophia by Justinian," indicates at once how widely the author, in his views as to the origin of the Mosque of Omar, departs from the prevailing tradition, which ascribes the edifice to the old Arabian or Saracen conquerors of the Holy Land. So confident is Professor Sepp in the correctness of his new theory that on the title-page of his work he even goes so far as to publish a strange challenge to all who do not accept his view, by an "offer of a prize" of 3,000 piastres to any one who will prove the contrary. The arguments he adduces in favour of his theory seem, at any rate, to have practically convinced some of the best architectural critics of Germany, like Herr W. Lübke. The latter writer remarks that the English travellers, Messrs. Catherwood and Arundale, were the first European travellers to enter the celebrated mosque. This they did in 1833, at the imminent risk of their lives. They subsequently published their drawings of the edifice. The next European who entered the building was another English traveller, Mr. Fergusson, who contended that under the cupola of the Sachra Mosque was the real tomb of Christ. A more important contribution, however, to our knowledge of the mosque is thought to have been made by Count Melchior de Vogüé in his splendid work on the Temple of Jerusalem, published in 1864. The most valuable result established by his beautiful drawings was the confirmation of the Byzantine character of all the main architectonic forms in the edifice. Nevertheless, the belief in the Mahometan origin of the mosque continued to hold its ground, and it was supposed either that portions of a Christian church might have been incorporated into the building, or that possibly a Byzantine architect had been employed in carrying out the work. It was not to be denied that the ground-plan and construction of this monument of architecture diverged completely from the usual type of old Arabian mosques; while, on the other hand, there are characteristic analogies to it to be found in the numerous leading Byzantine buildings. Comparatively recently Professor F. Adler had been permitted to examine the cupola, and the result of his investigations was to convince him of its old Arabian origin. It is against this view that the work of Professor Sepp is directed, the latter writer contending that the structure is of Christian origin, and that it was, in fact, founded by the Emperor Justinian, who is chiefly noted for having erected the Cathedral of St. Sophia at Constantinople.

The weight of the arguments Professor Sepp adduces in support of his opinion cannot, in Herr Lübke's opinion, be denied. He points out that we shall search in vain through the whole series of mosques of undisputed Arabian origin for a central cupola like that at Jerusalem. The oldest Mahometan temples all agree in having a central court surrounded by galleries. How little the ground-plan of the rock-dome was adapted for a mosque is shown by the subsequent addition of the Kibla, which, as is well known, shows the direction in which the prayers of worshippers have to be addressed. Professor Sepp, therefore, has very good ground for asserting that the Sachra Mosque appears about as unsuitable as can well be imagined for the worship of Islam. Herr Lübke remarks, however, that, "on the other hand, even for Christian services, the building is very ill suited indeed, because it does not possess the altar apsis, so indispensable for Christian worship. With the exception of the 'Baptisteries,' we cannot point out any Christian temple without that feature." Professor Sepp then traces the origin of the Arabs and the state of civilisation amongst them at the period of their great conquests. He shows how highly improbable it is that such a race of barbarous nomads should be able to create and execute so grand and perfect a work of art as the celebrated mosque at Jerusalem. The weight of these arguments is only increased when we consider that in architecture the Arabs, as a race, were far less distinguished as bold constructors than as splendid decorators. It is true that there were Turkish architects at a later period who distinguished themselves by the great central cupolas of their works, but it is notorious that it was the model of the St. Sophia Church which inspired them in these unusual achievements. In complete contrast to the Arabs, the Byzantines were celebrated from the first as the great constructors of the Christian world. In a whole series of important domes they had carried out the central idea of a Christian temple. It is known that this tendency prevailed from the time of the Emperor Constantine. Sta. Costanza, near Rome, and still more, the octagonal Antiochia and the Church of the Holy Sepulchre at Jerusalem, are the first important illustrations of this direction of Christian architecture. But it was the Emperor Justinian who, in a series of monumental edifices, brought this style to completion.

It is sufficient to mention as examples, the Church of St. Sergius and Bacchus, St. Vitale at Ravenna, and St. Sophia at Constantinople. That the Omar Mosque may belong to this series, appears in itself quite probable. The probability is strengthened if we consider the character of the architectural forms in the Rock dome, for when we accurately examine the details of De Vogüé's drawings there can remain no doubt that all the fundamental elements of the buildings, except what is immediately recognisable as the later Arab additions and restorations, bear the character of the age of Justinian. Only the twelve slender Corinthian columns of the inner circle may possibly have been borrowed from some other ancient monument. However, we require more accurate and detailed drawings in order to settle this question. On the other hand, the sixteen columns of the octangular gallery, as their capitals with the cross on the abacus, and the Byzantine warrior show, belong to the Justinian epoch. Still more decisive is the observation made by Dr. Bernard Sepp, the author's son, in his examination of the inner arcades. He tells us that the pointed arches prove to be a later Saracen addition, since behind their marble tablets there are still the original Byzantine round arches. If this fact is confirmed there is no longer any reason, so far as the architectural forms are concerned, to doubt the Byzantine and, indeed, Justinian origin of the building. Of course, the entire upper part of the structure the ornamental gallery, and wooden cupola, in the place of which originally there was undoubtedly one of stone, are Mahometan restorations, and date from some time after the great earthquake of the year 1016. The later restorations and additions were carried out under Saladin after the re-conquest of the Holy City in 1189, while the splendid glass paintings with the faïence incrustations were executed under Soliman II., in 1528. If, then, with Professor Sepp we ascribe to Justinian the origin of the dome as well as the contemporaneous architecture of the Golden Port, then in place of the incomprehensible anomaly arising when we attribute the work to the Saracens, we have a result harmonising in the best possible way with the other facts of the history of art, as we must place the cupola among the other great central edifices of Byzantine origin. In connexion with this, the Mosque El Aksa, which is generally supposed to be the St. Maria Church of Justinian, must be set down as an originally Arabic mosque, erected by Abdel Melek with Byzantine building materials. It should be remembered that in the foregoing account we are making known only the views of Professor Sepp and his German critic.

A SEWAGE FARM IN THE LEA VALLEY.

THE following are some particulars of the sewerage works which have recently been carried out in the special drainage district of Much Hadham and Hadham Cross, a town situated on the river Ash, a tributary of the Lea. Previously to the execution of the works, the place was in the usual unsatisfactory condition which obtains where cesspools form the only means of disposing of the sewage. A number of the wells were found upon analysis to be contaminated. The district is of a somewhat rural character, and it was considered one where the surface-water generally was sufficiently pure to flow at once into the natural water-courses. The separate system of sewerage was therefore determined upon. The nature of the place made it somewhat difficult

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to gravitate the sewage on to land sufficiently raised above the level of flood-waters, and so avoid the error, only too prevalent in the Lea Valley, of discharging sewage on to land too low to be effectively under-drained; but it was found after careful investigation that a suitable site could be acquired some mile down the line of the Ash. The sewage is taken to this land by a 12-in. outfall-sewer, having a gradient of 1 in 660, which contours the side-long ground to the west of the valley for the purpose of obtaining convenient depths. The manholes on the outfall-sewer are furnished with sluices, so that the flow can be headed-up and a velocity obtained in excess of that due to the gradient. The tributary sewers are 9 in. in diameter, with the exception of a short length having a rapid fall, which is 6 in. The gradients are so arranged as to give the greater falls where they are most required, at the upper ends, and average about 1 in 100, except in the case of the principal town sewer, where there is a considerable flow of sewage, which has a gradient of 1 in 300. These sewers also are provided with sluices in the manholes to aid the flushing arrangements. The total length of the sewers is about two miles and a half, and they are constructed throughout of stoneware pipes, jointed with yarn and Portland cement. Particular care was exercised to secure water-tight sewers, and an idea may be gained of the success of these efforts when it is known that, although at the completion of the works not a drop of water got into them (notwithstanding the fact that a considerable section was laid below the level of the subsoil waters), yet before a dozen house-connexions had been made a stream of sewage passed down the whole length of the outfall-main on to the land. Ample ventilation is afforded by manholes and lamp-holes at frequent intervals, which are carried up to the surface and covered with strong iron gratings. These covers are well finished off, having four rings of granite pitching bedded round them, falling slightly away from the centre, so that the danger which so often exists to horses and carriage-springs is entirely obviated. The flushing arrangements are very complete for a district without a water supply. One of the flushing tanks (the largest) is placed at the extreme head of the system, and its contents can be suddenly discharged through a 9-inch outlet pipe. Water is collected chiefly from land drains and the road surfaces, but the large tank already referred to is supplemented with an Abyssinian well and pump, so that even in the dryest seasons water can be obtained at the point where it is most needed; and as the network of sewers is arranged so that nearly the whole can be flushed, if necessary, from this one tank, the system is practically independent of the storage of rainfall for flushing purposes. It has been found by experiments that even without the use of the sluices in the manholes one discharge produces a flow of considerable velocity through the entire length, which is maintained to the extreme point of outfall. No settling-tanks are provided to retain the sewage until putrefaction sets in,—a frequent cause of nuisance,—but a small straining-tank in duplicate receives the flow and intercepts rags, corks, &c. It is needless to say that under the above conditions the sewage reaches the outfall in a fresh state, and becomes assimilated by the soil and vegetation long before decomposition takes place. The sewage farm recently purchased by the Sanitary Authority consists of some four acres of land on the west bank of the Ash. The soil is a light gravel lying above the chalk. Water-tight pipe conduits are constructed along and across the farm, and are furnished with an efficient system of sluice-chambers to enable the sewage to be directed to any required spot. Part of the area has been trenched 2 ft. deep, and the remainder was deeply cross-ploughed. The whole of the sewage is passed over the surface and through the soil. The works have only been completed some six months, and the farm is already in full work. A good roadway has been made along the line of the upper boundary, affording ample facilities for cartage, &c. The system of sewerage is found to work well, and it is to be hoped that as much care has been taken in carrying out the connexions. The total cost of the structural works was under 2,500*l*. Messrs. Smith & Austin were the engineers who designed and carried out the works, and Mr. Barnard Lailey performed the somewhat onerous duties of resident engineer. We hear that at Wormley also, lower down the valley of the Lea, land has been acquired, and that works of sewerage are about to be carried out by the same engineers.

PROPOSED NEW ART GALLERIES, GLASGOW.

A MEETING was held in the Council Chamber, Glasgow, on the 22nd ult., convened by the Lord Provost, with the view of submitting to a number of leading and influential citizens a proposal to provide a suite of buildings to be devoted to the Art Gallery, Industrial Museum, Public Reference Library, and School of Art purposes.

The Lord Provost explained at considerable length the very inadequate provision which at present existed for the purposes mentioned. The Public Library was, he pointed out, accommodated in a portion of a warehouse, temporarily altered to suit library work; while the only museum was the small building in Kelvingrove Park, which, although it might perhaps suit the purpose of a district museum, could never be considered as fitted to meet the requirements of a central and principal industrial museum for a large city like Glasgow. On the other hand, the rooms devoted to art purposes in the Corporation Galleries were totally inadequate as regarded size, and were also very badly suited in construction, and for years the Corporation had been desirous of carrying out some scheme whereby a properly well-lighted building might be secured for art-gallery purposes. At present the school of art was accommodated in the Corporation Galleries, and so unsuitable were the rooms that Glasgow students in national competitions were placed at a most unfair disadvantage when competing with students, even of small provincial towns, where thoroughly equipped schools were provided. The scheme he had to submit proposed to embrace in one block of buildings adequate accommodation for the four purposes he had referred to. If adopted, the scheme involved the purchase of a large square of vacant ground in Sauchiehall-street, immediately to the west of the Corporation Galleries. Were that piece of ground acquired, it was expected there would be ample building accommodation on the south, west, and east sides for a range of art-galleries. On the north side a range of school of art rooms could be placed, and the central part might be filled in with a large industrial museum, having a glass and iron roof. As regarded elevation, it was suggested that the present block of Corporation Art Buildings in Sauchiehall-street be remodelled, and that the site of Dalhousie-street, which separated the present buildings from the block proposed, might be utilised to form a good central entrance for bath blocks of buildings, thus giving a continuous elevation of 560 ft. in length to Sauchiehall-street. To give effect to this pile of buildings, it was proposed to carry the main line of buildings considerably back from the ordinary building line, thus giving a frontage of free street space of about 90 ft. His purpose in convening the meeting had been to endeavour to obtain the support of those interested to assist him in carrying out such a scheme, as he was desirous that the ground should be purchased by public subscription, and presented as a free site to the Corporation.

Several other gentlemen addressed the meeting, and a general expression of approval was given regarding the scheme. A committee was afterwards appointed to take further steps to carry out the proposal.

Sir Philip Cunliffe Owen, the director of South Kensington Museum, has been consulted as to the advisability of carrying out the proposal, and a letter was read from him at the meeting warmly recommending the scheme for adoption.

The Shirhind Canal.—The *Times* Calcutta correspondent telegraphs particulars of the opening, by the Viceroy of India, of the Shirhind Irrigation Canal, one of the greatest works of the kind ever constructed. It will be of immense benefit to the Punjab, as it will irrigate an area of three-quarters of a million acres, or 1,200 square miles. The canal itself is over 500 miles long, and of subsidiary channels there are 2,000 miles more. It has taken forty years to construct and has cost 407 lakhs of rupees.

THE EDUCATION OF ENGINEERS.

THE Society of Engineers, desirous of assisting to maintain the *status* of the profession, have taken a practical step of some importance in the direction of affording additional facilities for professional education. We have received a syllabus of the three series of lectures for which the Society has made arrangements, and which are advertised on our front page. Each of the courses deals with an eminently practical and important subject, and each has been entrusted to an able exponent. The fees payable by those who attend the lectures are exceedingly moderate in amount, and we sincerely trust that the Society's efforts will be rewarded by large attendances in each course. The lectures are open to members of the architectural profession, and each of the courses now advertised,—viz., "Strains on Ironwork," by Mr. Henry Adams; "Land Surveying and Levelling," by Mr. A. T. Walmisley; and "Water Supply and Drainage," by Mr. R. W. Peregrine Birch,—deals with a subject with which every architect ought to be more or less acquainted. The Council of the Society feel persuaded that these lectures will greatly add to the usefulness of the Society, especially in educating the young engineer in technical knowledge, and they express a hope that their members of all classes will place before their pupils and assistants the beneficial advantages to be derived therefrom.

The initiation of these courses of lectures is invested with additional significance when taken in conjunction with a movement which has been set on foot with the view of, sooner or later, establishing an examination which would have to be passed by all who are desirous of becoming members of the body. At the present time, any one, however incompetent, may dub himself a "civil engineer" or "mechanical engineer," just as any one may call himself an "architect" or a "surveyor." Of course it is possible, by the exercise of due care, to discriminate between compent practitioners and pretenders in each and all of these professions; but, unfortunately for themselves, a large proportion of the public are unable to exercise this discrimination unassisted by some such criterion of competency as is afforded by ability to pass the examinations recently established by the Royal Institute of British Architects and the Surveyors' Institution, for architects and surveyors respectively. If it be necessary, for the safety of life and limb, to say nothing of property, that the architect should prove himself to possess a sound knowledge of construction before being allowed to practise, and if those who employ him have a right to demand of him some proof of his competence, it is obviously no less essential that the members of the engineering profession,—whose ramifications are so wide, and upon the stability and strength of whose works the lives, health, and means of millions of people are dependent,—should show themselves to be worthy and competent followers of their great calling. It is true that, engineering enterprises being very often on a vast scale, involving the expenditure of millions of money, the promoters may generally be relied upon to confide their interests to men of proved attainments and distinction in the engineering profession; but these great works have to be carried out under the personal supervision of younger men acting as resident engineers, who ought to be (as they mostly are) men of skill and resource in dealing with any emergency that may arise.

Much more might be said in favour of the institution of an examination for civil and mechanical engineers, but before such an examination can be established, there are many points to be considered. Those who are stirring in the present movement point to the Institution of Civil Engineers as the examining body. It has been suggested, however, that as the proposed examination is intended for mechanical as well as civil engineers, better results would follow from the appointment of a board of examiners jointly appointed by the Institution of Civil Engineers and the Institution of Mechanical Engineers,—the senior representative bodies of the two branches of the engineering profession. In the event of an Engineering Examination being established under such auspices, the question would arise,—it has, indeed, been anticipated,—Shall the Institution of Civil Engineers remain an educating body when it becomes an examining body? Those who favour the present movement are disposed to answer this question in the negative, and they

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suggest that the large number of students now under by the ægis of the Institution should be transferred to one of the junior engineering societies, which should become essentially an educational body, carrying on its work under very much the same method of organisation, as we understand it, as prevails in the Architectural Association. In this way, it is urged, the newly-organised junior society would, in conjunction with existing educational agencies, afford a constant stream of candidates for the proposed examination. The projectors may be over-sanguine, but there is, nevertheless, much in the project that is worthy of consideration.

CHANCEL DECORATIONS AT ST. PAUL'S CHURCH, WALWORTH.

The chancel of St. Paul's Church, Lorrimore-square, Walworth, which until recently was well known as one of the most advanced ritualistic churches in the metropolis, has, during the last three months, been undergoing a very elaborate process of re-decoration, notwithstanding that the high ritual for which the church was formerly distinguished has to some extent been abandoned. The decorations having been completed, the chancel was re-opened last week with special services. The east wall of the chancel has been decorated in gold and varied colours, and Scriptural figures introduced. The subjects represented are full-length figures of the four evangelists, with busts of the four great prophets, Isaiah, Jeremiah, Ezekiel, and Daniel; whilst underneath, on either side of the altar table, are emblems of the Passion. The two returning north and south walls have also been decorated and painted, the artistic work consisting of pomegranate foliage. The panels of the chancel ceiling have likewise been included in the decorations. Those portions of the panels immediately over the sacrarium have been painted in turquoise blue, with gold stars, and the remaining panels in oak. A massive new reredos has also been placed over the altar. The subject of the reredos is the Adoring Angels, in marble mosaics, enclosed in a framework of alabaster. Carved oak clergy and choir stalls have likewise been introduced, replacing the old painted stalls. The front of the organ has also been re-decorated, and the stained-glass east window has been lengthened.

Messrs. Heaton, Butler, & Bayne, of Garrick-street, Covent-garden, have executed the decorations, and furnished the reredos, the clergy and choir stalls having been furnished by Messrs. Earp, of Kennington-road. The whole of the works have been carried out under the supervision of Mr. Arthur Blomfield, architect, at the cost of the Rev. Evylin Alexander, the vicar.

NEW BUILDINGS FOR MESSRS. CROSSE & BLACKWELL.

On the site in Belvedere-road, Lambeth, formerly occupied by the premises of Messrs. Holland & Hannen, an extensive new block of buildings is now in course of erection for Messrs. Crosse & Blackwell. The buildings will cover a ground area of 25,000 ft., the depth from Belvedere-road to the river being 200 ft. The premises will have a frontage to the Thames, 125 ft. long, the river elevation being 70 ft. in height to the cornice, the roof, which will contain a lantern light, being carried to a further height of 20 ft. The elevation will be in red brick, from the Adderley Park Company's Works, Saltley, near Birmingham, with red terra-cotta strings, window arches, and cornice, furnished by Messrs. Doulton & Sons. The building will contain six lofty floors, and a basement carried to a depth of 10 ft. below the ordinary high-water mark, and having a Wilkinson's concrete floor. The Belvedere-road frontage will also be in red brick and terra-cotta, and will be four stories in height.

The entrance in Belvedere-road, 14 ft. in width, leads into a large open courtyard, 90 ft. in length by 40 ft. in width, around which are the several buildings, divided into six blocks. On the south-east side of the entrance, on the ground floor, is the boiler-house, an apartment 45 ft. square, whilst at the opposite angle are the stables, the remaining portion of the floor consisting of six spacious warehouses. The several upper floors likewise contain large warehouses, besides manufacturing, preparing, and packing premises, together with ranges of offices. The several floors will contain an aggregate floor space of about 60,000 ft., or nearly an acre and a half in extent, exclusive of the basement, which will contain cellarage and storage space.

Messrs. Roumieu & Aitchison, of Lancaster-place, are the architects, and Mr. F. S. King, of Billiter-avenue, the contractor. Mr. Weston is clerk of the works.

THE REGENT'S CANAL AND CITY RAILWAY.

PURCHASE OF LAND.

The Regent's Canal, City, and Docks Railway Company, which obtained an Act of Parliament last session, after a protracted and expensive contest in the Parliamentary committee-rooms, are immediately about to commence the construction of the line, and are making the necessary purchases of land. The project includes the building of a station in the neighbourhood of Aldersgate-street, not far from the station of the Metropolitan Company, and for this station and the general purposes of their undertaking the company have just purchased the large area of land on the south-east boundary of the City in Golden-lane. The land, which has for some time past been vacant, and which contains 45,336 square feet, has been bought from the City authorities for the sum of 80,592*l.*, being at the rate of nearly 2*l.* per foot. It is stated that the purchase-money is intended to be applied to the erection of artisans' dwellings in Petticoat-square, eastward of Golden-lane.

BURGOS CATHEDRAL.

This structure, to which we have recently drawn attention, is one of the finest specimens of ecclesiastical architecture in Spain. It is now being restored, and being provided with stained-glass windows. For the purpose of the latter work, a competition was instituted in which the principal stained-glass works of Europe took part. The commission (which was composed of members of the Madrid Academy) awarded the prize to Zetler, of Munich. The main subject is the Assumption of the Virgin, which will be represented in the principal window.

The early history of this cathedral is involved in much obscurity; but a few trustworthy data are available. It is certain that the foundation-stone of the edifice was laid on July 20, 1221, by King Fernando III., together with his queen, Beatriz, and Bishop Mauricio, as is shown by an entry in an old calendar of the church, where it is stated, "Primus lapis ponitur in fundamento novi operis ecclesiae burgensis xx. di mensis Julii, era millessima ducentessima quinquagesima nona, die Sanctae Margaritae." The works were not brought to a final conclusion until the month of December, 1864, when, at the initiative of Archbishop De la Puente, the door known as Sarmental was renewed, and a fresh floor of white and blue Carrara marble laid down. According to a French writer, Paul Alary ("Voyage artistique"), the church "is a legacy four centuries old, to which each generation has added its share of artistic wonders. It is an inlaid stonework, a kind of gigantic filagree work, which inspires the beholder with enthusiasm and a kind of awe at its more than human execution."

The exterior of the cathedral is even more imposing than its interior. The illustration which we give in this week's *Builder* represents a front view, and produces a striking effect. The façade is flanked by two gigantic steeples richly and tastefully adorned, the whole forming a characteristic specimen of the art of the times. According to Dr. Martinez y Sanz, those steeples, at sunset, when the sun's rays strike the metal and wood work below, appear from a distance to be floating in the air. Behind the façade rises from the centre of the transept a powerful lantern, surrounded by a circlet of eight turrets of fine workmanship, respecting which the Emperor Charles V. is reported to have said that they ought to be preserved in a case as a precious jewel. The view is closed in by another mass of turrets and finials rising, respectively, over the chapels of the Coroneria, Pellejeria, and Condestable.

We learn from another entry in the same calendar that it was nine years after the commencement of the works, in 1230,—"*era millessima ducentessima sexagessima octava*,"—that divine service was held in the cathedral. A hundred years later, on June 4, 1336, royal letters patent, granted by King Alfonso XI., witness that the "masters are at work on this church." Another record, in *Libro redondo* (vol. lvii.), points to "Tuesday, September 18, 1442, as the day on which the first stone was laid for the towers which are now being renewed in the Church of Santa Maria of Burgos." Still another entry in the same *Libro redondo* (vol. lxxiii.) states that "the towers which rise over the Puerta Real were finished on September 4 of the year of our Lord 1458." Both are said to have been built on the plans and under the direction of the architect Juan de Colonia, and at the expense of Bishops Alonso de Cartagena and his immediate successor, Luis de Acuña.

The first story of the principal façade is not the original work; of the latter, which was constructed as far back as the thirteenth century, only a faint reminiscence remains, in the shape of a crude engraving in vol. xxvi. of *España Sagrada*, a work by Padre M. Florez. It is reported that, ruin threatening the façade, it was replaced by another, erected at the instance of Archbishop Rodriguez de Arellano by the architect Gonzalez de Lara. According to another record, it was discovered in 1749 that the towers showed signs of failing, owing, it is stated to the left tower being built on a slight elevation of the ground, instead of a solid foundation. The damage, however, cannot have been very serious, for it was repaired by two architects, Manuel Cueto and Domingo Ondátegui, at a total expense of 25,000 reales (about 250*l.*).

The transept of the cathedral has also undergone several vicissitudes. It was completed at about the end of the fifteenth century, at the expense of Bishop Acuña, and is described by a contemporary as an "*affabrè constructum*." According to Bishop Ampudia, it was "one of the most beautiful works of the universe." The transept was totally destroyed (by fire?) at the dawn of Tuesday, March 4th, 1539, after only fifty years of existence. A few hours after the catastrophe, however, the municipal corporation of Burgos, by a unanimous vote, resolved to rebuild the transept, "confident of the pious generosity of the inhabitants of Burgos." Having, within a few days, collected the sum of 450,000 maravedises (about 1,500*l.*), the work of rebuilding was proceeded with under the direction of the architects, Francisco de Colonia and his successor, Juan de Vallejo. A beginning was made in October of the same year, and the work was completed in December, 1567, twenty-eight years after its commencement. On August 16th, 1642, we learn further, about 7.30 p.m., a strong hurricane overthrew the turrets of the cupola or lantern. The inhabitants of Burgos again came generously to the rescue, together with the cathedral chapter and the bishop, "moneys being received for this purpose from the Indies from native Burgenses and others." The work of restoration was carried on under the direction of the architect Juan de Rivas, and finished on July 19th, 1644. Strangely enough, in the morning of the very next day, on July 20th, the Burgenses were roused from their slumbers by the pealing of bells, announcing that fire had broken out, and to their horror they found that the transept of their cathedral was in flames, which threatened at one time to envelop the whole building. However, by great exertion the fire was confined to the transept, and was got under without doing great damage.

If it is asked who were the architects of the cathedral, we meet with a long roll of names. The first one mentioned in the records of the municipal archives is Enrique, who also directed the works of Leon Cathedral; he died on July 10th, 1277. The second was Juan Perez, who died in 1296, and was buried in one of the cloisters of the cathedral, and is supposed to have been a brother of Pedro Perez, the painter of Toledo Cathedral, who died six years before, in 1290. The third architect of Burgos Cathedral was Pedro Sanchez, who directed the works in 1384. After that, Juan Sanchez de la Molina, Martin Fernandez, the three Colonias, Juan de Vallejo, Diego de Siloe, Nicolas de Vergara, Matienzo, Pieredonda, Gil, Regines, and others, laboured successively; as well as, during the fourteenth and fifteenth centuries, many Moors, such as Mahomad, Yunce, the "master" Hali, the master Mahomet de Aranda, the master Yunza de Carrian, the master carpenter Brahen, &c. Amongst sculptors may be mentioned Juan Sanchez de Fromesta, the masters Gil y Copin, Felipe de Vigardi, Juan de Lancre, Anton de Soto, Juan de Villareal, Pedro de Colindres, and many others.

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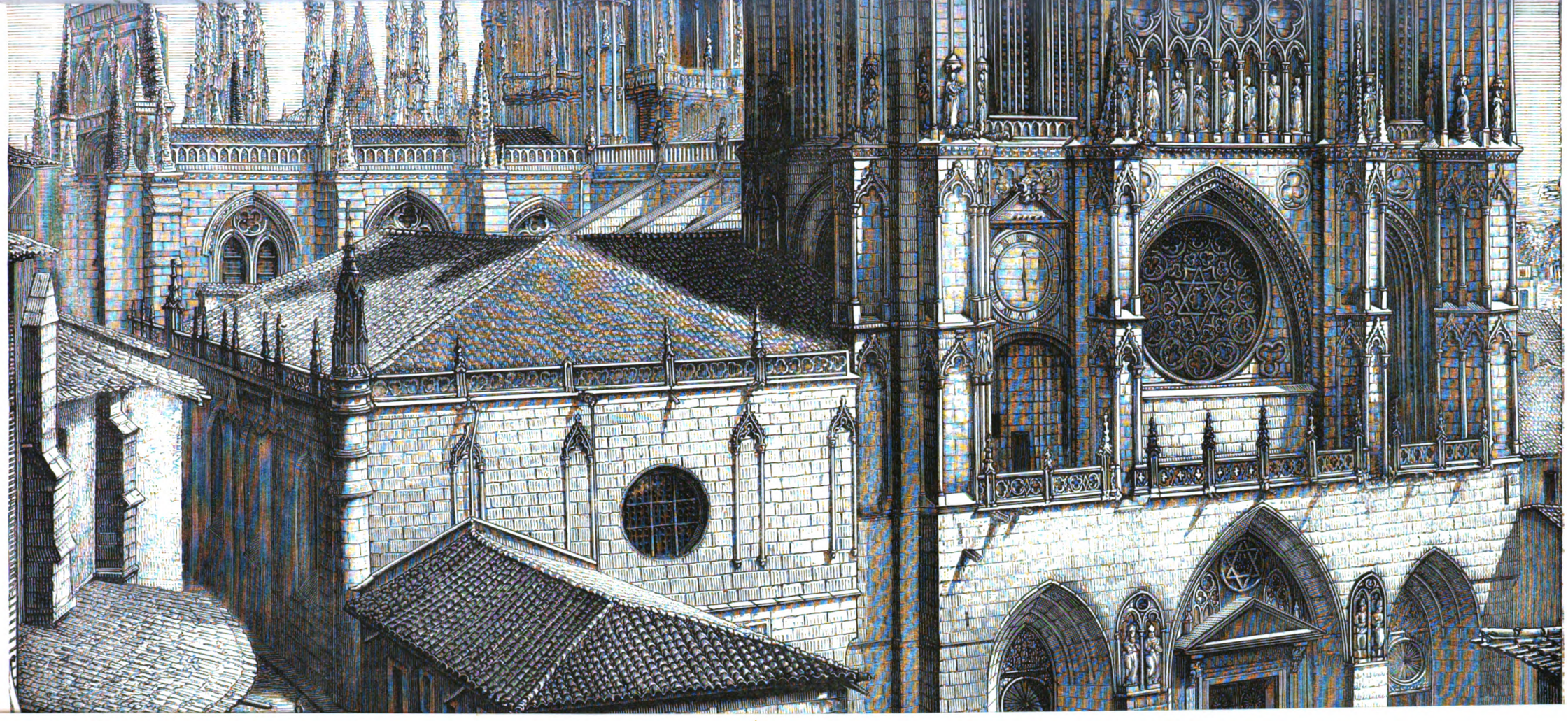

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THE NEW PARISH CHURCH OF S. PAUL, HAMMERSMITH.

JOHN P. SEDDON & HUGH ROUMIEU GOUGH, JOINT ARCHITECTS.

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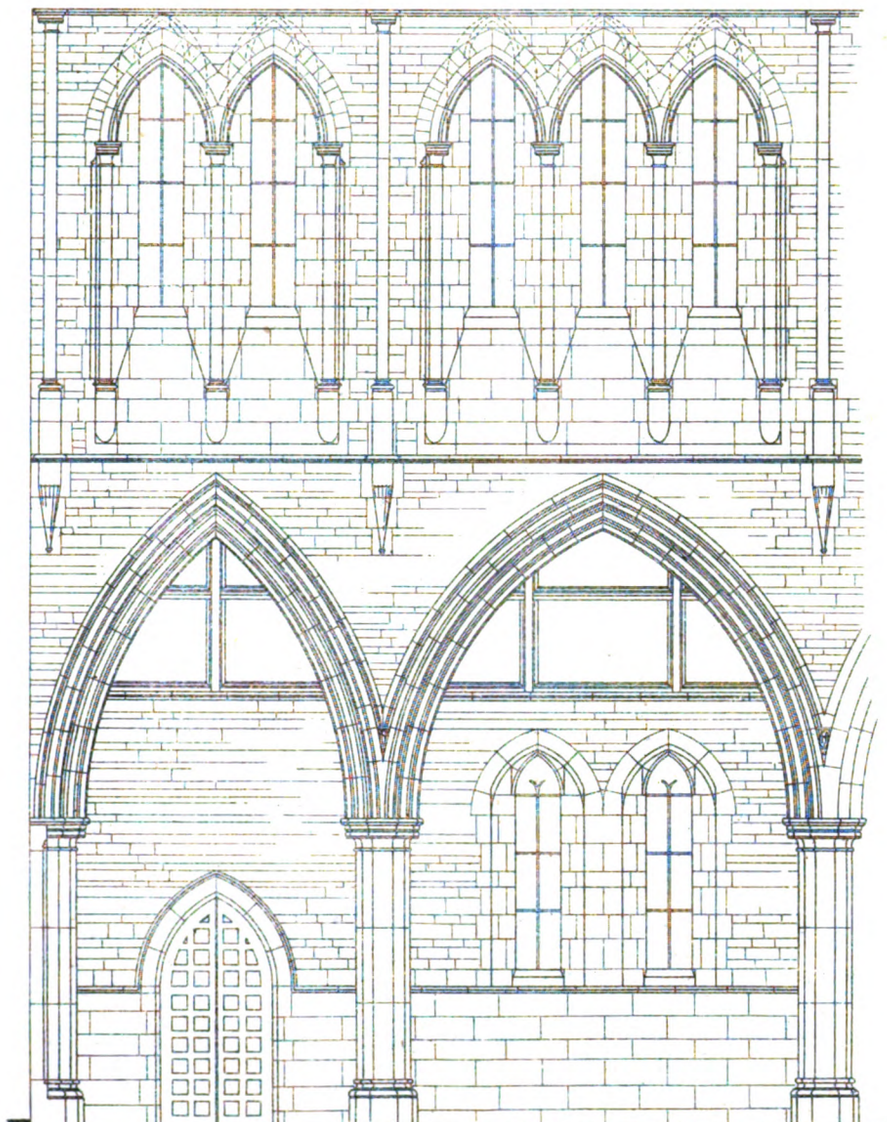
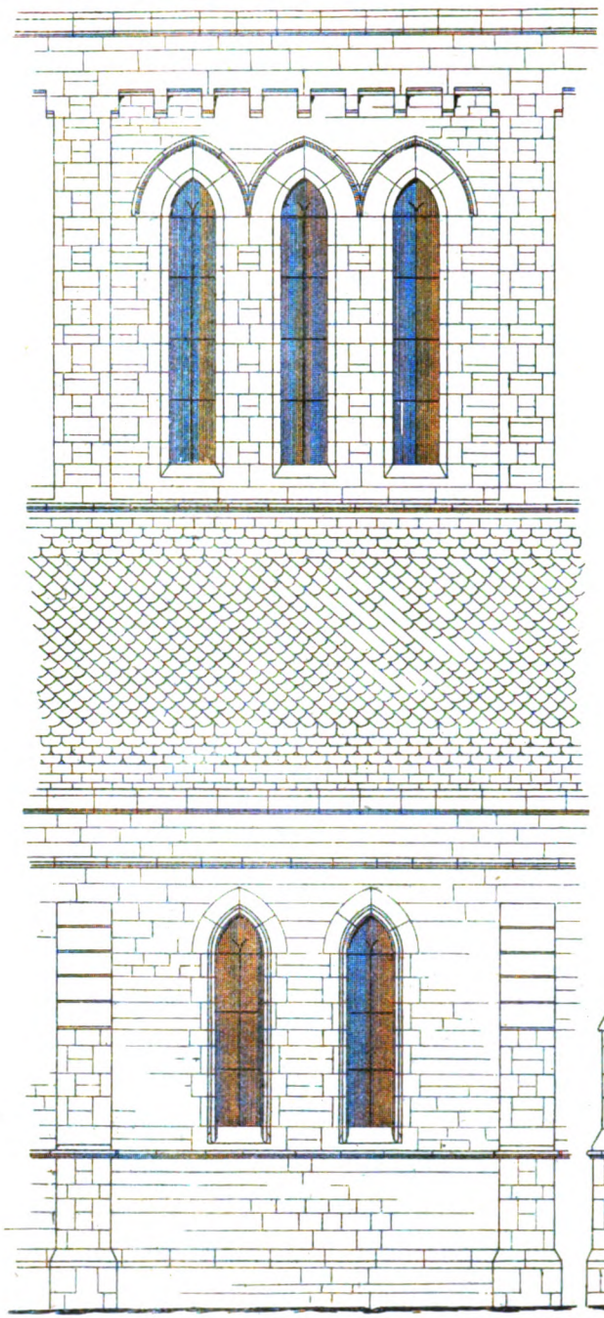
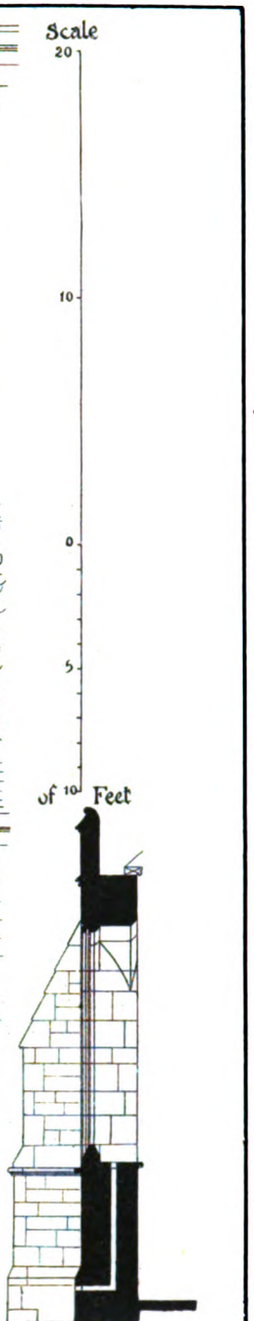
PARISH CHURCH OF S. PAUL - HAMMERSMITH

Interior and Exterior of Nave.







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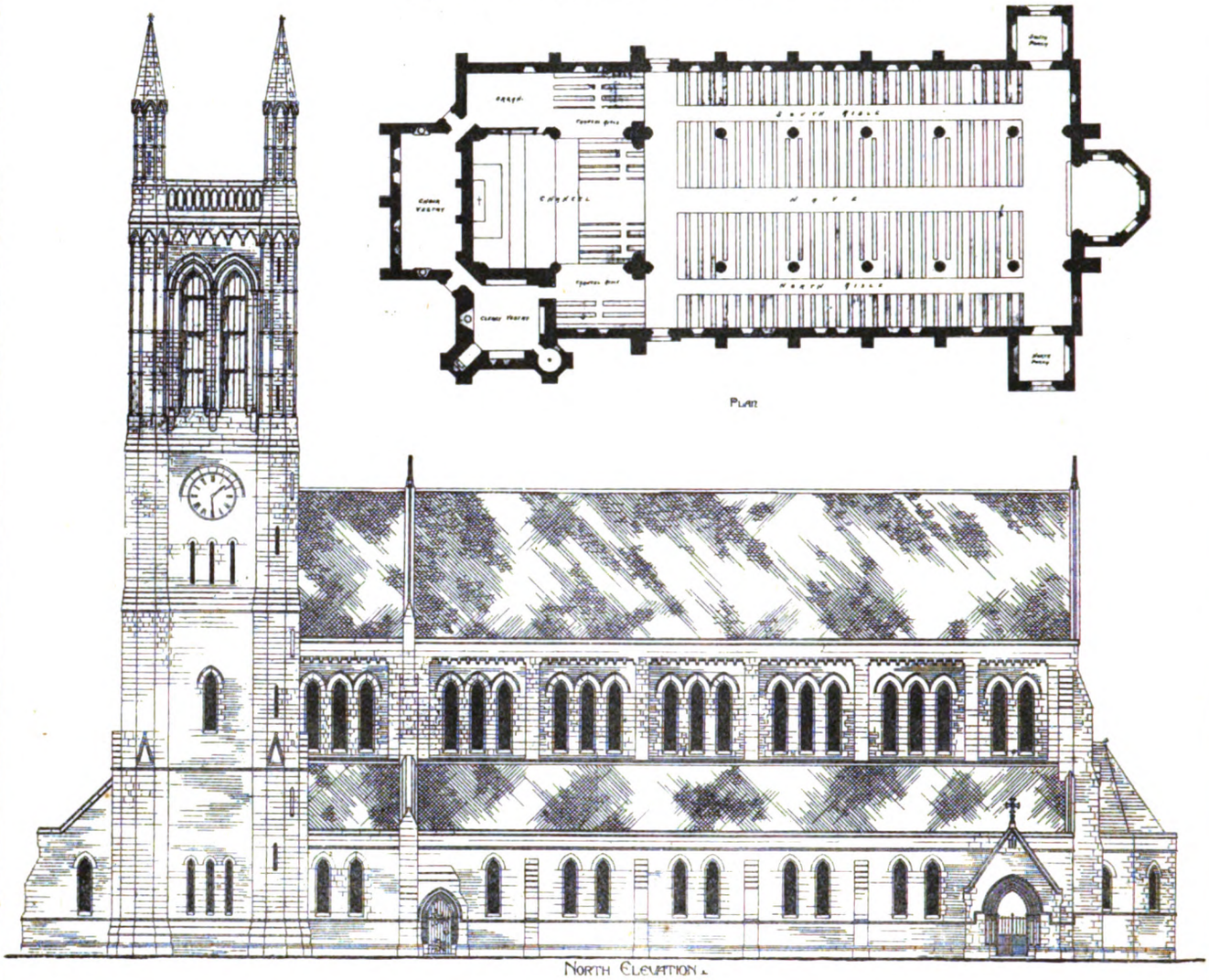
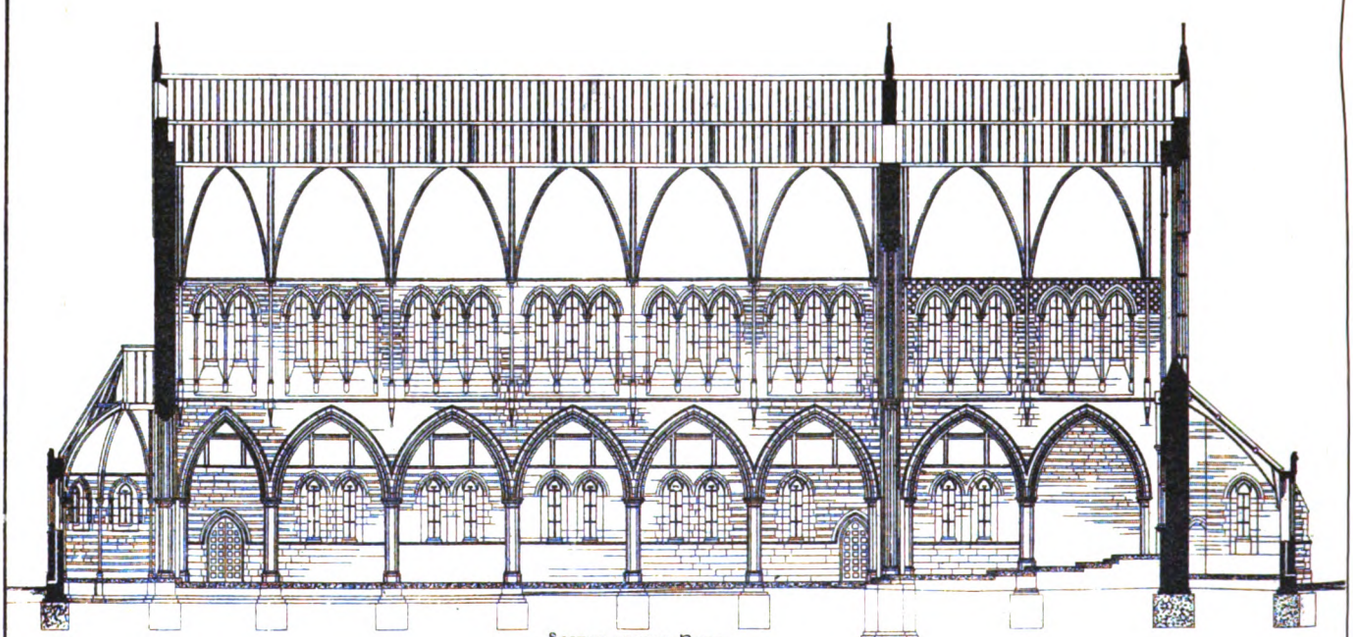
Plan



North Elevation.



Section looking North

Parish Church of S. Paul, Hammersmith

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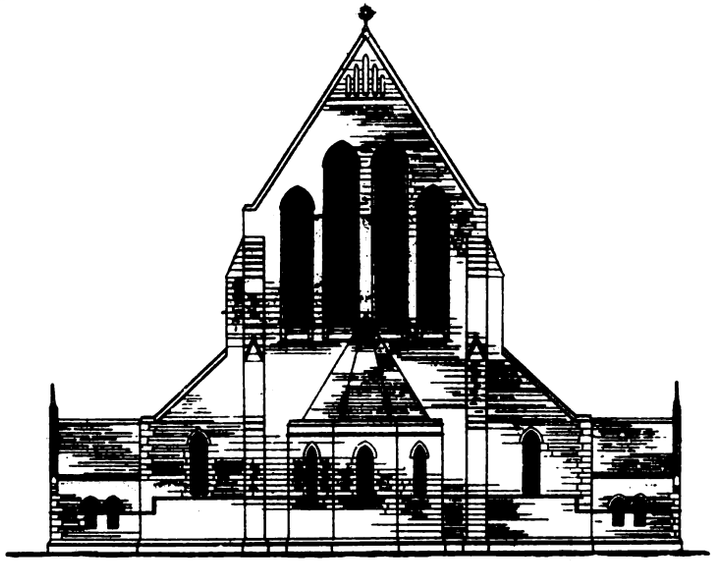
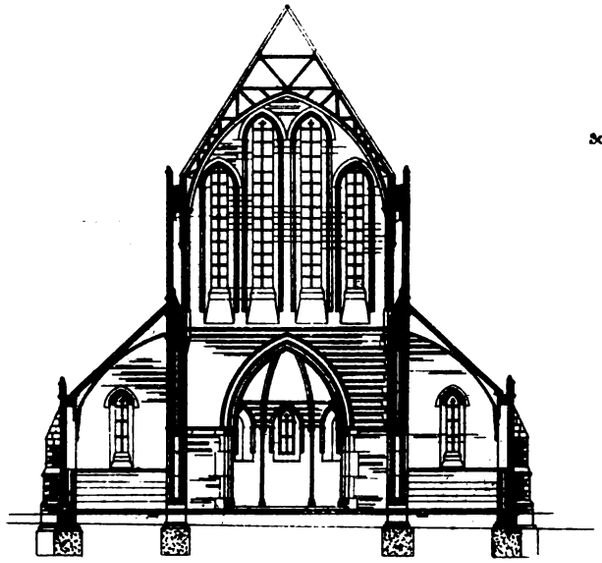
PARISH CHURCH OF S. PAUL - HAMMERSMITH

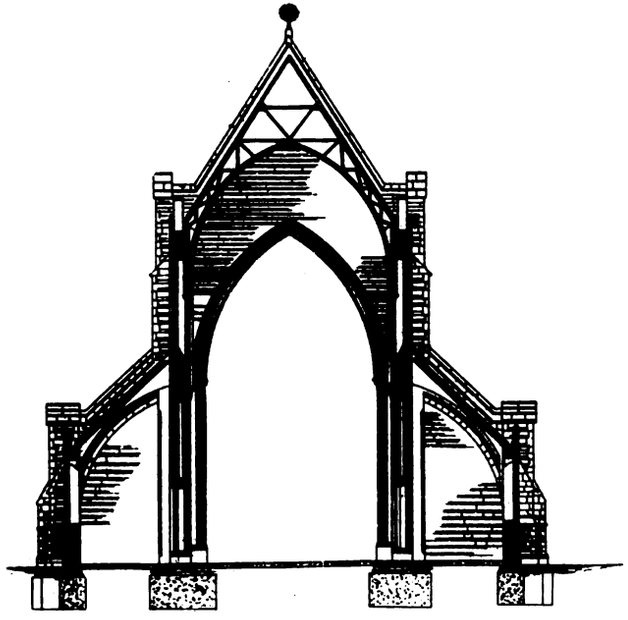
SCALE OF 1" 0 1' 0" 2' 0" 3' 0" 4' 0" 5' 0" FEET.



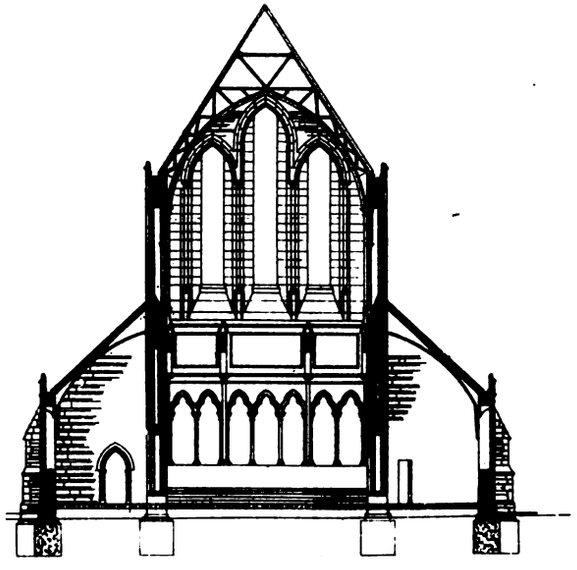
WEST ELEVATION.



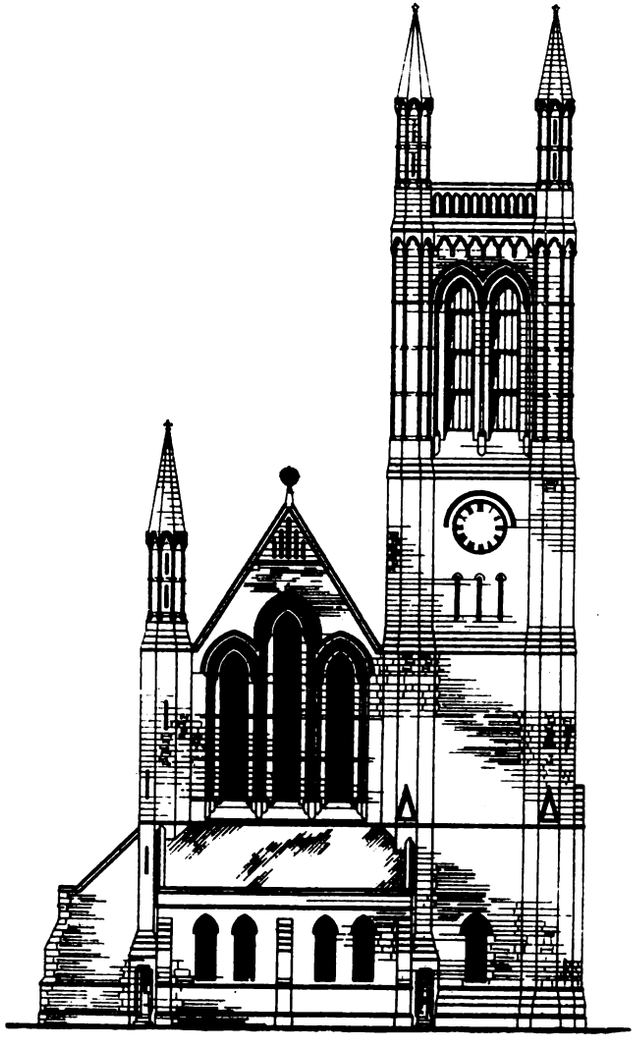
SECTION LOOKING WEST.



Section looking East



Section through Chancel



EAST ELEVATION.

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ST. PAUL'S CHURCH, HAMMERSMITH.

THIS church, which forms the subject of our lithographic illustration pages this week, is in course of erection under the direction of Messrs. J. P. Seddon and Hugh Roumieu Gough, as joint architects. From the paper read by Mr. Seddon before the Architectural Association on the 24th ult., we take the following descriptive particulars, the drawings being part of his illustrations,—

In order to obtain the lofty proportions particularly desired by my colleague and the committee, it was necessary that the building should be dignified but simple, and devoid of ornate detail, as the funds at our command were strictly limited. Such being the case, we have given great study to the question of the materials, and have reason to think that we have been somewhat exceptionally fortunate in that respect. The stone for the exterior wall masonry is of red Mansfield, laid in horizontal courses, with the facework hammer-dressed. This is being supplied from Mr. Robert Lindley's well-known quarries at a price which competes favourably with that of the far colder and less pleasant looking Kentish ragstone with which Londoners are, in our opinion, unfortunately too familiar. Then the stone for the facing of the walls internally is brown Ancaster, of a rich warm colour, but beautifully varied. This is, we think, the first time that this has been used in the metropolis, although in Mediæval times it was extensively used in the churches of Lincolnshire; and indeed the quarries, which also belong to Mr. Lindley, were worked by the Romans. As regards the stonework for the dressings we have been less fortunate; we had hoped to have had all the dressings executed in red Mansfield, but owing to the great cost of working, we have been compelled to content ourselves with Box-ground stone for the exterior and Corsham Down for the interior, the blue bed of which has been selected by us generally for the aisles, in order that they may harmonise with the marble of which I am about to speak. The whole of the columns and responds, with their bases and capitals, are of a Belgian marble, known on the Continent as "Belgian granite," and much used in old Flemish churches, as well as in those of parts of France. The quarries from which we are obtaining this material are situated at Soignies, near Brussels, and are so extensive to be practically inexhaustible. This marble can be obtained in blocks of almost any size, and the isolated columns in this church are of single stones 2 ft. 2 in. in diameter and about 10 ft. long. Its appearance is very similar to our Purbeck marble, though for richness and beauty of colour, in our opinion, this Belgian marble is superior. It has also the advantage of being exceedingly cheap, owing to the comparatively low rate of wages paid in Belgium. This is being used for the first time in England for this work. Mr. Gough, who has visited the quarries, will, I am sure, be happy to give you any information regarding this excellent material, with which, I may add, it is the intention to line the inside walls of the church up to the string-course below the sills of the aisle windows. The whole of this marble that I have mentioned, with the exception of the capitals and bases of the columns, will be polished. I would call attention to the construction of the roof as being novel in ecclesiastical architecture and different from any of those I have previously described. Iron for structural purposes has been hitherto rather the friend of the engineer than of the architect; indeed, to the latter, and I must own to myself, it has been almost held as an enemy. We should not have used it from choice in this instance, but the necessity for economy, and the desirability of avoiding all lateral thrust upon the lofty clear-story walls, and any visible ties which would have to cross under the vaulted ceiling, led us to its adoption. Mr. Gough's engineering knowledge, acquired many years ago whilst in the Government service, has, I think, well solved the difficulties of the problem, though in a different manner to that in which I have attempted to do so. Each of the latticed wrought-iron principals is, in fact, a girder, exerting no outward thrust whatever, except, of course, what may be due to wind pressure, which is felt in every roof, no matter what its construction may be. In this respect the report of Mr. Bidder, the engineer, so entirely confirms Mr. Gough's opinion as to disarm further criticism, since æsthetic considerations are, in this instance, outside the question. No portion of the ironwork of the roof will be left visible, as there will be a ceiling with groining ribs below it, which it is intended to treat with colonred decorations.

ARCHITECTURAL ASSOCIATION.

AT the ordinary fortnightly meeting of this Association on the 24th ult., Mr. Edward G. Hayes, President, in the chair, the following gentlemen were duly elected members, viz.:—Messrs. A. Kent, G. J. Oakeshott, A. R. Manby, T. B. Rutherford, F. W. Macey, A. B. Johnson, H. H. Hughes, H. W. Collins, T. R. Clemence, A. Gordon, S. Strudwick, A. Roberts, E. T. Boardman, S. H. Seager, J. W. Stonhold, E. E. Brooks, T. E. Watkins, H. H. Satchell, W. F. Cave, A. H. Hart, W. J. W. Ferguson, C. W. Wright, H. S. Perkins, W. W. Short, J. Short, P. Thompson, W. E. Potts, H. H. Mew, A. E. Hanscomb, H. Baker, T. Leadbetter, A. R. Wright, W. G. Nicol, A. H. Freeman, A. W. Bentham, E. W. Knight, C. S. Hornabrook, H. Hutchings, J. A. Whichcord, A. Clark, H. J. Westell, F. Williamson, C. H. Bedells, J. H. Goodman, H. L. Whiteley, F. A. Steer, J. E. Still, W. Sheen, jun., W. F. Kelsey, M. Fawcett, E. A. Barnard, A. S. Tayler, F. Massie, H. H. Flowers, F. M. Elgood, G. L. Stutfield, W. A. Moull, A. B. Atkinson, A. J. Ward, and W. Leck (sixty in all).

The Chairman then formally moved the adoption of the annual report of the Association, which contains the following passages:—

"The committee, in presenting the report of the past session, while being able to announce a continuance of the prosperity of the Association, and a rapid increase in the number of its members, feel that the attendance at the various classes during the past session has been scarcely in proportion to that increase; they desire, therefore, to direct the special notice of members to the great advantages to be derived from taking an active part in the working of one or more of the classes; these being, especially to the younger members, among the most useful of the many valuable opportunities and advantages afforded by this Association. The committee trust that during the coming session the classes will be fully appreciated and attended by greatly increased numbers.

Great improvement has, during the past session, been observed in the discussions following the papers read at the general meetings, and the committee hope that this improvement will be fully maintained, and still further developed throughout the coming session. . . . .

The library now contains about 1,200 volumes, and continues to be well attended. A new and revised catalogue has been prepared. . . . .

The courses of lectures in connexion with the Classes of Design and Construction, referred to in the report of last session, have been given by Messrs. Tarver and Blashill, and have been numerously attended. The thanks of the whole body of the Association are due to these gentlemen for their very valuable services. A special grant has been made to the library for the purchase of books for the use of those availing themselves of these lectures. The courses of lectures will be repeated during the coming session.

The new class formed for the study of planning and specification-writing has been well attended, and the syllabus for the session energetically carried out.

The Association Travelling Studentship has this year been won by Mr. W. A. Pite; Mr. F. H. Tulloch being awarded the second prize; and Mr. A. S. Haynes receiving Hon. Mention.

The following are amongst the honours taken by members of the Association during the past session:—

Royal Institute of British Architects.

Godwin Bursary	A. J. Gale.
Soane Medallion	A. B. Pite.
Second Medal	L. Stokes.
Hon. Mention	G. H. Sbackle.
Grissel Gold Medal	H. P. Drew.

Royal Academy.

Travelling Studentship and Gold Medal	J. H. Ince.
Silver Medal for Measured Drawings	T. C. Yates.

Contributions to the Prize Fund have been made by Messrs. Aston Webb and Ernest C. Lee."

The report was adopted without discussion.

Mr. J. Douglass Mathews, treasurer, moved the adoption of the balance-sheet, which showed that the total receipts for the session 1881-82 had been 724*l.* 6s. 4d. (including 112*l.* 14s. 4d. balance brought forward from the previous session). The amount received for members' subscriptions was 381*l.* 19s., while entrance-fees amounted to 112*l.* 7s. The total expenditure was 595*l.* 7s. 6d. (including 155*l.* for rent), leaving a balance of 128*l.* 18s. 10d. in the treasurer's hands.

The Chairman called attention to the last-issued number of the "Proceedings" of the Royal Institute of British Architects, which contained a great deal of useful matter for the guidance of all young architects who were preparing for the Architectural Examination. It was gratifying to note that the Institute had fully recognised the work which was being done by the Association, and had largely quoted from the "Brown Book."

Mr. Douglass Mathews said he was glad the President had called attention to the matter. Young architects who were seeking to make themselves proficient in their profession ought to be grateful for the facilities now afforded them, for instead of being left to flounder about in search of knowledge, as they would have had to do a few years ago, they had now a complete course of study laid down for them by those who were fully cognisant of their requirements, and it would be their own fault if they did not avail themselves of the facilities now within their reach.

Mr. A. Beresford Pite said he believed that in the Institute scheme of Examination 175 marks were allotted to Art and 425 marks to Construction. He wished to know whether the Association was to be understood as endorsing such a distribution of marks, and whether the proportion of marks was to be taken as indicative of the Association's view of the relative importance of these two subjects in an architect's education?

The Chairman ruled that the question raised by Mr. Pite could not be discussed on that occasion.

Mr. Stannus having given a kindly lecture to those members of the Association who thoughtlessly or selfishly keep in their possession beyond the specified time the books which they borrow from the library,—to the great detriment and injury of their fellow-members who need the books for purposes of study,—

Mr. John P. Seddon proceeded to read his paper on "Sundry Working Drawings," the first portion of which we print on another page. We also reproduce some of the drawings with which the paper was illustrated.

The Chairman, in opening the discussion, observed that Mr. Seddon had touched upon a great variety of subjects in his very interesting paper. He had expressed a misgiving lest he might be accused of egotism in bringing his works before them, but that was precisely the kind of egotism of which they in that room would be glad to see a little more, for nothing could be more useful to the younger members of the profession than for a gentleman of Mr. Seddon's experience and mastery of his art to take the trouble to show and explain to them so many drawings. He was very glad that Mr. Seddon had so strongly insisted upon the necessity of architects making their working drawings as clear as possible. Such drawings should be without a superfluous line, and free from shading, or some ludicrous results might follow if the drawings were put into the hands of unintelligent workmen. He remembered a case in point, in which a bricklayer was proceeding to execute in black brick some shading which was shown on a drawing.

Mr. R. E. Pownall moved a vote of thanks to Mr. Seddon for his paper, and for the admirable display of drawings by which it was illustrated. As to the question of the scale of working drawings, the one advocated by Mr. Seddon, viz., that of three-sixteenths of an inch to a foot, was, to some extent, a novelty, and although a very desirable scale in some respects, it was open to the great objection that it was not one that could be readily read off, with an ordinary foot-rule, and therefore the adoption of such a scale would add to the difficulties of the workman. With regard to the church at Redruth, he thought that granite hardly accorded well with Bath stone, and it would, in his opinion, have been better to have relied on the local material entirely, even at the sacrifice of some of the detail.

Mr. J. Osborne Smith seconded the motion, and observed that the drawings exhibited both the primary conditions essential in a working drawing, viz., clearness and accuracy. Indeed, these two qualities might be said to be all that was wanted in a working drawing. With regard to the new church at Hammersmith, he could

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not help feeling gratified that Mr. Seddon had at last condescended to the use of iron in the construction of the roof of that church. At the same time, he regretted that for a London church Mr. Seddon should have used Bath stone externally while marble was used internally. In his judgment, it would have been better to spend the money expended on marble for the interior in Portland or some other good hard stone for the exterior, using Bath stone internally. In our London atmosphere he thought the exterior of the church would be better preserved a hundred years hence if this course had been followed.

Mr. A. B. Pite, in supporting the motion, said that Mr. Seddon was not the first architect of experience and position who had been kind enough to give the Association the benefit of his knowledge. Two sessions ago Mr. William White read a paper,* in which he gave some of the experience he had gained in church building, and that paper, like Mr. Seddon's, was ungrudgingly illustrated by the author's drawings. In looking at Mr. Seddon's drawings one saw that their author was an architect who loved his work. Mr. Seddon had constantly and faithfully devoted his energies to working in one style, and the consequence was that, after many years of a somewhat extended practice, he had acquired a facility in that style which very nearly approached perfection. He thought that young architects might draw from Mr. Seddon's career a very valuable lesson, viz., that success would wait upon those who were diligent and constant in their adherence to one grand principle. Other architects might be named who had achieved eminence in the same way. He trusted that the members of the Architectural Association would take that lesson to heart, and if they did so they would be able, when they had reached the *acme* of their lives, to present to the then Architectural Association, for the edification of their juniors and pupils, such an excellent series of drawings as had been exhibited by Mr. Seddon on the present occasion.

Mr. S. G. Turner, after some remarks with reference to roof construction as illustrated by the drawings, said he had been astonished to hear Mr. Seddon say that he had never used a girder in his life, for it seemed to him (the speaker) that in these days rolled iron girders and joists were necessary, and even indispensable, to the architect. It seemed, however, that Nemesis had overtaken Mr. Seddon by compelling him to use iron for a church roof.

Mr. Hugh Roumieu Gough said that, with regard to the materials used in the Hammersmith Church, he might, as joint architect of the building with Mr. Seddon, say that they regretted very much that they were compelled to use Bath stone at all. It was the only church of any importance with which he had had anything to do in which he had allowed Bath stone to be used at all. As to the use of marble internally, he might say that for structural reasons they were compelled to use some hard stone, and this Belgian marble was nearly as cheap as Portland stone, for it only cost, polished, about 8s. 6d. per foot cube, taking it all round. For the clustered columns † carrying the nave arcade, Bath stone would not carry the weight of the superstructure. Externally it was their wish to have used Mansfield, but the difference of cost between that material and Bath stone amounted to between 4,000*l.* and 5,000*l.*, and the funds available would not allow of the use of the more costly material. The instructions of the committee were to build a church of Kentish rag and Bath stone,—a combination of materials which he abominated. With regard to the use of iron for the roof, it should be observed that all the ironwork of the principals was concealed by the wooden groining. He supposed the time would come when architects would use iron more boldly, and in positions where it could be seen. In the present instance it was fairly and legitimately used, for it was far more economical than wood, while it obviated the necessity of ties, and prevented thrust upon the walls. With regard to the brown Ancaster stone which had been mentioned by Mr. Seddon as being used in the interior of the church, he believed it was the first time that material had been used as a walling stone. This Brown bed lay deep in the quarries, and used to be known as the Corn Grit. It had until lately very little market in London, and very little even in Lincolnshire. It varied from a rich red to browns and yellows; no two blocks were precisely alike in colour, and its effect in mass was very rich. It was a very cheap walling stone, and he hoped to see it more extensively used.

The Chairman having put the motion, it was carried with much applause.

Mr. Seddon, in acknowledgment, thanked the members for the kindness with which they had received his paper, and entered into a brief explanation of the construction of some of the roofs, as to which questions had been asked.

The meeting then terminated.

* See *Builder*, vol. xl., p. 319.

† Our view shows the cylindrical shafts of stone as originally proposed.

EDINBURGH ARCHITECTURAL ASSOCIATION.

A meeting of this society was held on the 22nd ult., the president, Mr. David MacGibbon, in the chair.

Before proceeding to the business of the evening, the Chairman said the society was called upon to express its deep regret at the death of Mr. James Lorimer, who had been one of its most prominent members, and had aided in all circumstances with his good advice and his best wishes. He proposed that they should minute their sense of the loss the society had sustained. This was agreed to.

From minutes subsequently read, it appeared that arrangements for the proposed exhibition were being pushed forward, the date of opening having been fixed for the 22nd of December, as already stated in the *Builder*. Of the 100*l.* considered necessary as a guarantee fund, 95*l.* had been subscribed. The Chairman said everything looked very well indeed for the success of the exhibition.

Professor Baldwin Brown then proceeded to read a paper on the "Mosaics of Ravenna." The Professor, in the outset, pointed out the importance of the mosaics in question as the finest existing examples of the style of art commonly called Byzantine, and went on to describe the special characteristics of this art as compared with that of the periods which preceded and came after it. The art of the Catacombs, he remarked, was of a slight and playful character, making large use of classical forms of decoration, and dealing with specially Christian themes mainly through symbols. The art of the Byzantine period, when the Church became a recognised power in the world, was of a monumental character, presenting to the congregation the impressive forms of Christ and of the saints. The Middle Ages proper introduced more dramatic force and pathos into the representations, and took up subjects like the Crucifixion and the Last Judgment, unknown in the earlier periods. Passing to Ravenna itself, Professor Baldwin Brown sketched briefly the history of the city, and mentioned the three periods to which the best mosaics belonged, answering respectively to the times of Galla Placidia, of Theodoric the Goth, and of Justinian. Some of the principal mosaics were then described in chronological order, stress being laid upon the admirable arrangement shown in the works, and upon their decorative as well as their pictorial excellence. Photographs were exhibited showing the design of some of the more important mosaics, and their relation to their surroundings.

At the close, a cordial vote of thanks was accorded to Professor Baldwin Brown.

SOME UNRECOGNISED POINTS IN DRAINAGE.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

At a meeting of this Society, held at No. 1, Adam-street, Adelphi, on November 17th, the President, Dr. J. W. Tripe, in the chair, a paper was read by Mr. Rogers Field, M. Inst. C.E., on "Certain less recognised, but highly important, Points in the Drainage and Ventilation of Houses," of which the following is an abstract.

Three sanitary principles govern house drainage, these are:—

1. All refuse matter must be completely and rapidly removed from the house.

2. There must never be any passage of air from the drains or waste-pipes into the house.

3. There must be no connexion between the drains and the domestic water-supply.

These, although so simple, are very frequently neglected; the first goes absolutely to the root of sanitation, for were it strictly complied with there would be no leaky drains, no polluted subsoil, and no production of foul gases in the drains from decomposing organic matter. There cannot be a greater mistake than to assume, as is commonly done in investigating drainage, that if water runs away with freedom, this is all that is required; numerous cases are on record where the sewage from houses has apparently run away freely for years, but where the greater portion of it has really been leaking out of the drain into the ground under or close to the house.

In illustration of this point, the author quoted two cases in his own practice, one in which the connexion with the sewer was actually found to be blocked with shavings, which had been left in when the house was built three years before; the other, that of a school in which the drainage from the lavatories had leaked through disused drains under the floor of a large portion of the building, and where, although there was a mass of filth in some places 7 ft. deep, no leakage had been suspected.

If the drains are exposed and found clean, and jointed with cement, this is not sufficient; the tops of the joints may be good and the bottoms bad. The only safe method is to actually test the drains by plugging them at the lower end and filling them with water; very few house drains, indeed, stand this test.

Even if the drains are outside the house, it is a mistake to assume that it is unimportant whether they are sound, for not only may sewage leak out out of faulty joints and percolate under the house, but foul air may be drawn into the house.

It is important to realise how small an amount of deposit will create mischief by decomposing and generating foul gases; a mere irregularity of the joints, even when the drain has a good fall, is sufficient to cause this. There is no better test of the condition of the drains than the amount of smell emitted from a ventilating opening, for if the drains be properly laid and in thorough working order, practically no smell should exist.

Faulty forms of traps and water-closet apparatus were strongly condemned by the author, and diagrams descriptive of good and bad closets were exhibited.

The principle that there should never be any passage of air from the drains or waste-pipes into the house was then considered, and the means of isolating the house-drains from the public sewer, the necessity of keeping the drains outside the house, their ventilation as well as that of the soil-pipes, the position of the water-closets, the disconnexion of the sanitary fittings inside the house from the drains, were referred to. It was insisted that the danger should be guarded against of trusting too much to those parts of the drainage of a house which are visible as an index of the condition of other and important parts which are concealed, and an instance was mentioned of a house the drainage of which had been recently reconstructed, and where all the sanitary arrangements appeared, at first sight, to be perfect, but where a subsequent examination of the drains which were under the house showed that the joints were, in many places, defective, and at one point the pipes were not jointed at all, but a space left large enough to put a hand in, though it was stated that special care had been taken to make the drains watertight. Old drains, which had no outlet, connected with gullies, were found beneath the passages and rooms; the housemaid nearly died of typhoid fever, and beneath the room she occupied was found an old drain with a large amount of foul deposit. A long list of other defects was described, leading to the conclusion that the drainage, instead of being very good, was really so radically defective throughout that it was necessary to reconstruct the whole of it.

Another instance was given in which a lady and her cook were attacked with erysipelas and blood-poisoning shortly after occupying a house. Various alterations were made in the drainage in the absence of the family, but on their return the lady was again attacked with erysipelas, and shortly after other members of the household. Again alterations were made, and again the lady was attacked with erysipelas, and the housemaid with typhoid fever. An examination of the house by the author showed that an old stoneware drain in the scullery, into which the sink formerly discharged, before it was disconnected, had not been removed, and, though stopped with cement, the stopping was

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imperfect, thus allowing the air of the drain to enter the house.

The author next considered the various ways in which foul air from faulty drainage inside the house passes to different parts, and pointed out the opportunities which were given for the passage of air from one part of a house to another, depending chiefly upon windows and fires, the latter, of course, mainly acting by drawing air through passages, staircases, and doors. But other channels must also be borne in mind, and an interesting account was given of the passage of foul air along bell-wire tubes, the proximity of the bell-pull to the fireplace giving an increased opportunity for air to be drawn from a distance to this part of a room. Channels for gas-pipes and for hot-water pipes also not uncommonly give facility for the admission of foul air. In connexion with this part of the subject a remarkable instance was given of a particular bed in a school, the occupants of which were constantly the subjects of slight attacks of pneumonia, with tendency to typhoid. In this case the foul air was conducted from a lavatory where there was defective drainage, up a staircase, and impinging on the ceiling of the dormitory, was reflected on to the bed where the sickness occurred.

An interesting account was given of the cause of the Duchess of Connaught's recent illness. Defective drainage was found in the basement of the house, and after numerous experiments, the means by which the foul air entered the Duchess's bedroom were discovered. These showed that it was only when occupying certain positions in the room that she would be exposed to the influence of the foul air, while in bed she would escape. As a matter of fact, in twenty-four hours after sitting on a sofa in one of these exposed positions her Royal Highness's symptoms fully developed themselves.

The necessity of a thorough disconnexion between the drains and the domestic water-supply was then dwelt upon, and the mistakes most commonly made in this particular pointed out.

In the discussion which followed, the President, Dr. Buchanan, Dr. de Chaumont, Dr. Corfield, Mr. E. C. Robins, Dr. Bate, Mr. Jacob, Dr. Rogers, Dr. Poore, and Mr. Shirley Murphy took part.

THE CONSUMPTION OF SMOKE.

LIVERPOOL ENGINEERING SOCIETY.

AT a meeting of the above society, held on the 22nd inst. at the Royal Institution, Colquitt-street, Mr. H. Bramall, vice-president, in the chair, a paper was read by Mr. W. E. Mills, entitled "Notes on the Mallett System of Controlled Combustion." The author, in introducing his subject, stated that the question of dealing with the cloud of smoke hanging over our large cities, and the immense waste of heat which its presence testified to, had been attempted in many ways from time to time. All engineers were familiar with the different kinds of smoke-consumers and fuel-economisers which were before the public, but none of which altogether achieved the end aimed at, viz., the consumption of the smoke generated by the fuel in the furnace. Mr. Mallett, of Denver Colorado, U.S.A., who had studied the subject, saw that the difficulty with all the smoke-consumers was the impossibility of entirely burning all the atoms of carbon set free in the act of combustion. He conceived the idea that if by any means the fuel could be burned in such a manner as not to produce any smoke at all, and so preserve all the heat which would be otherwise wasted, a great step would be gained. He effected this in the following manner: a combustion-chamber is fitted behind the boiler-furnace, communicating with it by a perforated septum wall. The fire-bars were made hollow, and so arranged that cold air from the exterior could pass through them into the combustion-chamber. The open ends of these fire-bars could be closed by a slide, worked by a lever, which also actuated the apertures in the ashpit-doors. When coal was first put on the fire, the latter openings were closed. The gases given off from the fuel passed into the combustion-chamber through the apertures in the septum wall, and meeting there with the oxygen conveyed through the fire-bars, were entirely consumed. The inventor claims that by his method, no smoke being produced, all chimneys may be done away with, and a saving of about 45 per cent. in fuel effected. The necessary draught is provided by a fan, which draws the heated gases, the ultimate products of combustion, through a condenser, in which they are cooled down, and then discharged into the open air. The application of the system to stationary, marine, and locomotive boilers was next described, with the various scientific principles involved.

A discussion followed; and a vote of thanks was accorded to the author.

THE SMOKE NUISANCE.

THE question that most directly affects us who are acquainted with a particular grievance is that of the smoke nuisance. Most laudably it has been attempted by a committee of noblemen and gentlemen to devise means to get at the best and most practicable appliances that would be likely to mitigate the evil. The great movement inaugurated by the late Exhibition at South Kensington, and previously that by the Kyrle Society, must not be allowed to collapse. It has been demonstrated that a better state of things is possible, that coal may be burned, even in the open fire-grate, without producing smoke. Although the manner of doing it may not be so simple as to recommend it for general adoption, it has been sufficient to prove the fact. The manufacturers are sure to improve and ultimately perfect any appliance that is in the right direction, if they can rely upon receiving encouragement from the purchasing public, and those whose position in society authorises them to influence the owners of house properties.

Closely allied to the smoke-abatement question is the smoky chimney nuisance. With the former, grates must be used that produce a minimum of smoke; and with the latter the nuisance will partially disappear by using ventilating grates and Tobin's tubes. But my object in writing to you is not to attempt to say anything new to the readers of the *Builder*, for many, if not most, of them know already that chimney-pots and cowls are seldom really necessary. I can mention now, further, that these unsightly additions to the tops of the chimneys, as seen, say, in the neighbourhood of Park-lane, Brook-street, and the Bayswater-road, are not through the architect's recommendations, but through the decorator or jobbing builder,—introduced, perhaps, by one of the upper servants or the steward of the mansion. It does seem a pity that these dangerous and hideous appendages should be allowed to exist if they are not necessary. That they are not necessary, I make this bold and sweeping assertion; but, as I said before, the architects cannot help it. They are not consulted. Those only are consulted whose interest it is to get a little job to do, and they no doubt ignorantly introduce one of the many plausible advertisements of patent chimney-pots that will be "sure to be effective" (?). The gentleman having already found him to be a respectable and honest sort of a man as a shaker of his carpets or a cleaner of his windows, thinks he may as well get the pot and put it on as to get a stranger into his house. Hence the chimney-pots multiply.

In getting this evil checked and ultimately entirely put a stop to, it will be necessary to get at the proprietors of these large dwellings, and interest them in the question, and perhaps define a few simple rules by which they will be able to convince themselves whether it is not practicable to do without chimney-pots and cowls; for example, a grate suitable for one room is not necessarily suitable for all the rooms. Ascertain whether there is any tendency for a down-draught without a fire in the room; if so, see, by holding a lighted match to the keyhole or joint of the door or doors, to which direction the draught inclines,—if outward, which is generally the case, the chimney is being used as a descending-flue, to supply air to some adjoining hall or room, consequently a fresh supply of air (warmed preferred) in the hall or room next to the one with a down-draught will immediately change the currents, and cause that which before had been a descending-flue to be a good drawing chimney. Should there be no direct down-draught, and but a very sluggish up-draught, this evil may be got rid of by using a ventilating grate, slow-combustion grate, or "Tobin's tubes." One general remark. It would be a good system if every room of a new building were tested as to the inclination of the flues before a stove or grate were selected. This to be done first without fires, and then with fires on the hearths. ROBT. CRANE.

EMPLOYMENT OF A CRANE IN EARTH CONSTRUCTIONS.

IN the works connected with the raising of the level of the feeding basin of the Rhine, Marne, and Saar Canal at Gondrexange, in Lorraine, the contractors have made what, on the Continent, is spoken of as a novel application of the crane. The embankment surrounding the basin had to be raised by about 4 ft. 6 in. and the idea of availing themselves of machinery in carrying out the work was first suggested to Messrs. Weis & Bernatz, the contractors, by the fact that the wages for hand labour in that part of the country are relatively very high. They found that the quantity of clay which they had to convey from the boats to its place on the embankment would amount to not less than 100,000 cubic mètres, in addition to which they had 20,000 cubic mètres of stone to unship. They accordingly sought for a suitable crane, and obtained one from the works of Messrs. Booth Bros., of Rodley, near Leeds. They had the crane fixed on a bridge, placed upon two pontoons lying one behind the other, and by its help they were able to lift the clay and stone directly ont of the boats and deposit them at once on the spot where they were required. The distance over which it was necessary for the crane to reach in this process of unlading was unusually great. A suitable machine, however, was obtained at a cost of 400*l*. It has an arm with a reach of over 45 ft. The crane is made of American pitch pine, and it is capable of lifting over the maximum radius a weight of fully three tons. The pontoons on which the crane is fixed are able to bear a weight of thirty tons. The hinder pontoon is used as a counterpoise, and is loaded with ballast to such an extent that in the manipulation of the arm of the crane the deviations in depth never exceed 8 in. Another point is that the crane is capable of being turned round so as to reach over three-fourths of a circle, or 270°. The engine employed in driving the crane works with two cylinders, and by means of a break the load can be stopped and held fast at any height. The boiler is certified up to a pressure of six and a half atmospheres. From 3½ to 4 atmospheres' pressure suffices for the lifting of three tons. The clay employed on the work is brought by river in barges. These are each divided into four parts, each containing a large chest or box, capable of being lifted out. At the outer extremity of the arm of the crane is a chain, with four end chains terminating in a hook, and each hook fastens in an iron handle or catch in each of the chests. When the chest or box is lifted, the crane begins to revolve, so that the load in passing from the vessel to the shore moves in a spiral line. Some difficulty was met with at first in letting the clay out of the box. It was found impracticable to make the bottom of the box into a drop door, as the recoil in such an arrangement was found to act injuriously on the crane itself, owing to the too sudden difference of weight and pressure. This difficulty was overcome by an arrangement whereby one of the sides was gradually raised while the box was being raised and tipped on one side. The process of lifting out a box, emptying it, and putting it back in its place, does not occupy more than a couple of minutes. By help of the crane it was, therefore, found possible to unload sixty barges, each carrying ten tons of clay, per day. The difference of cost made by the use of the crane was enormous, as it was found that instead of fifty men at 3s. 6d. to 4s. a day, only five altogether, including stoker and engineman, were required to do the work, the outlay for coal being about 6s. a day.

Surveyors' Institution.—The next meeting will be held on Monday, December 4th. In view of important changes now in progress in the methods of producing the published maps of the Ordnance Survey, the time is considered opportune for the expression of the opinions of the members with reference to any practical defects or possible improvements in the maps in question. It is believed that any well-considered suggestions will be acceptable to the Director-General of the Survey, and the Council have, therefore, arranged for the reading of an introductory paper (to be followed by a discussion) at the above meeting upon the subject of "The Ordnance Maps, and Suggestions for their Improvement."

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OPENING OF THE NEW TOWN HALL AT LEYTON.

The rapid expansion of Leyton, which is increasing in population at a rate almost unprecedented, has rendered necessary the erection of a new public hall and offices for the transaction of the business of the district, and for some time past a new town-hall has been in course of erection. The building, having been completed, has been opened for business. It has been erected on a site near the railway station, said to be about the centre of the extensive district within the area of the local board. The building is three stories in height, and has two bold and handsome main frontages, with a tower upwards of 80 ft. in height, at the east angle, under which is the principal entrance into the building. The two principal frontages, —the one to the north-east, facing the Leyton-road, and the other facing the south,—are each about 70 ft. in length, the materials being white Suffolk brick, with a profusion of Portland stone for window dressings and general ornamentation. The entrance at the angular frontage, under the tower, is surmounted by a carved and moulded pediment in Portland stone, supported by piers with richly-carved capitals. The first floor of the south frontage has two lofty and ornamental two-light pediment windows, by which the principal apartment in the building,—the large hall or board-room,—is mainly lighted. A forecourt in front of the two elevations, about 12 ft. in depth, is enclosed by a dwarf wall, surmounted by ornamental railings.

The entrance to the building leads into a spacious hall or vestibule. The ground-floor contains the clerks' office, together with the offices of the assistant clerks; also a spacious committee-room, handsomely fitted and furnished; the surveyor's office, and those of his clerks; and the offices of the inspector of nuisances and the collectors. A wide stone staircase leads to the upper floors. The board-room on the first floor is 50 ft. in length, by 32 ft. in width, and is 25 ft. in height. It has an elegantly-decorated coved ceiling, divided into panels, the coved portion of the ceiling springing from a moulded cornice.

Mr. J. M. Knight, the surveyor for the Mile-end Vestry, is the architect of the building, and Mr. James Read, of Walthamstow, is the contractor. The cost of the building is 6,500*l*.

THE MANHOLE SCARE.

The outcry against the system of open ventilation of the public sewers into the centre of the carriage-ways lately raised, has had a powerful effect in alarming the minds of the general public, whose confidence in such matters is based on the opinions of experts. Its example has caused medical officers of health to be so bold in their statements concerning the evils arising from the gases escaping from the manholes, that the average member of the community half believes that the sewerage systems of our best towns, instead of being the means of carrying disease away from our homes, are actually the carriers of it to our very doors.

The Medical Officer of Health for the parish of Chiswick startled his Board a few weeks ago by stating that he knew of no other cause for a case of enteric fever in the parish than the exhalations from the manhole-ventilator in the street where it occurred. The Board promptly ordered an inquiry into the case, with a view to knowing whether their sewerage system, just completed at a cost of nearly 80,000*l*., was really a means of distributing disease and perhaps death. Dr. Corfield, Professor of Hygiene in University College, was called in, and has presented his report on the case. The manhole-ventilator alleged to be the cause was about 40 ft. from the house in which the case occurred. Inside the house he found that the scullery sink-stone was connected directly to the sewer, and that the only protection from the inrush of gas into the house from it, was a small bell-trap with a water-seal of at most ¼ in. When he removed the top of the trap, and held a lighted wax match over the mouth, the indraught was sufficiently powerful to cause the flame to flicker violently. He further found that the water service was intermittent, and that one cistern alone supplied the water-closet and the taps inside the house. He stated that, in his opinion, the disease was more probably caused by the sanitary defects inside the house than by the exhalations from the manhole. In this moderate opinion, experts will join. In such a case comment is needless. We will only venture to say that it raises in the mind an uneasy suspicion that medical men look upon the manholes as a cause to which they can refer every case presenting a difficulty of explanation, or in which they are too careless to make diligent search for the real cause.

Watchful.

FORESTS AND HAILSTORMS.

Sir,—An article under the above heading appeared in the *Globe*, on the 15th inst., in reference to the influence of forests in the prevention of hailstorms, and observations by Herr Riniker, the chief forester of Canton Aargau, Switzerland, are referred to in support of that theory. The subject is interesting, and perhaps the following remarks on the article and the question generally of the formation of hailstones may be acceptable for your columns. That forests induce an increase of rain is certain, and that they tend to the prevention of hailstorms is almost as much so; but on other points the remarks of Herr Riniker are, I believe, likely to mislead. He speaks of "hail-charged clouds" as if the hailstones were suspended in the clouds; and also of such clouds being very low. In an article in "Science for All," part 34, "On how Hailstones are forged in the Clouds," in reference to their occasional large size and crystalline form, the author (Dr. Mann) says, p. 296:—"A mass of ice, weighing 3 oz. or 4 oz. cannot be poised in the air like a snow-flake, whilst its prisms and pyramids are being fashioned by the slow and delicate process of molecular attraction and adjustment. The hailstones which are precipitated with the force of a projectile from the air must be the creation of an instant, notwithstanding the cunning regularity and methodical order of the lines." I believe that hailstones never fall from a low cloud, but may fall through one, and that the larger hailstones fall from a great height, being at first very small, but increasing in size as they fall by the accumulation of vapour from the atmosphere, and that they take their crystalline form whilst falling. The larger hailstones of these latitudes, *i.e.*, from 1 in. to 2 in. or 3 in. in diameter, have invariably a nucleus of white, opaque, compressed snow-like agglomeration, incased more or less in transparent ice. They are generally of a somewhat flattened spheroidal form, showing that these stones revolve during their fall; and at times crystals of ice are formed around the edge of their greater diameter. Their formation and fall I would account for as follows:—

As water is more than 800 times heavier than the air at sea level, and 3,000 times heavier than air at heights (five or six miles) at which clouds are known to form, it is obvious that no particles of water (vapour) could rise to such heights, or, in fact, to any height, and remain suspended unless by the aid of some buoyant power. This power I believe to be electricity, and there are good proofs of the connexion of electricity with evaporation. On this theory, in evaporation the minute particles of water rise with a charge of electricity in accordance with their own extent of surface and with the electric condition and temperature of the surface from which they rise, and are buoyed up by it to the level of their buoyancy in the atmosphere, until, from the effects of trees, mountains, or a damp and conducting condition of the atmosphere, the surcharge of electricity escapes, and, the buoyancy and mutual repulsion of the particles being thus reduced, they unite and fall as rain or sink to a lower level.

Clouds may thus form at different elevations, according to their electric condition, up to the greatest height at which vapour could float; the lower portion being liable to dissipation from causes as above named, but the more elevated clouds to which I allude are above reach from such causes, and, if away from mountains, could only be affected by thunderstorms or some such phenomena. Thus, we can readily imagine how, under certain meteorological conditions, and especially under those which present themselves in heavy thunderstorms, clouds might become piled up so as to discharge the electricity, by conduction, from vapour at heights far above that of ordinary rains. Under these circumstances, the precipitation would take place at a very low temperature, and in the consequent fall particles would attract particles, and this with increasing force as the aggregation goes on. The snow-like nucleus of the hailstones would thus be formed, and the liquid vapour collected in falling through the lower clouds being frozen by the cold of the nucleus descending from such a height would produce the covering of transparent ice in which hailstones are sometimes enclosed. The occasional formation of large crystals of ice on hailstones may perhaps be due to a partial suspension in their fall from whirlings of the wind, giving the crystals time to form from the deposit of liquid vapour under intense electric influence. The connexion of thunderstorms with hail, and the force with which the latter falls, needs no further explanation.

It is seldom that hail falls in Winter, especially in frosty seasons; and destructive storms, with hail of large size, generally occur in hot weather, after a calm, with more or less of drought, conditions under which it seems probable that the upper air, *i.e.*, as high as vapour could be floatable, would become heavily laden, and ready in case of a thunderstorm for the production of hail in the manner I have described. If this explanation be near the truth, it may readily be seen that forests, from their tendency to produce rain, must be preventive of hailstorms by keeping the lower air in a damp and conducting condition, and thus preventing any excessive accumulation of vapour in the atmosphere above them. The effect of forests as preventive of hailstorms, especially of coniferous trees, the pointed leaves of which attract electricity from surrounding vapour and increases the precipitation of moisture, was brought, by the late Dr. Rolleston, under the consideration of the Royal Geographical Society in a lecture at the evening meeting of May 12th, 1879.

Oxford. G. A. Rowell.

THE STONE QUESTION.

Sir,—It is still a marvellous thing that the stone used in London buildings perishes so quickly. I refer more especially to those buildings which have been erected during recent years, many of which I have observed already show serious symptoms of decay. This state of things is no doubt due to the want of care and experience in selection, and I am of opinion that if proper care were taken in selecting the stone our large buildings would be much more durable than they have hitherto been. Unfortunately this is an age of cheapness, and some people will use soft stone; it is a great mistake, however, to use such stone in the erection of London buildings, especially soft Portland stone. Properly selected Portland stone is the best stone that can be used for London work: of that we have proof when we look at some of the old buildings which have been erected of that stone; but its durability here depends on care in selection.

The brown stone, as I said some years ago, is the best stone that can be used; and I hope, for the benefit of the masons' trade of this country, that the stone will be selected with greater care in the future than in the past; if this is done, greater credit will redound to all engaged in masonry, and less disappointment will be experienced by those gentlemen who spend their lifetime in conceiving and carrying out designs for the approval and benefit of the public.

Frequently when I have been in some of the Bath stone quarries selecting some of the hard material, others have selected very soft; and as there is no doubt that the soft and the thin beds of Bath stone perish most quickly, there is every reason to expect that in a few years hence we shall have a great deal more decay than we have had in past years.

Just a word or two with reference to the red grit stone. I have taken great interest in examining this stone in the neighbourhood where it is obtained, viz., Dumfriesshire and Carlisle, there one can see a great deal of it already perished. I am not in a position to say that this stone is from the same quarries as that which is now sent to London; but I wish to warn stone-buyers against those agents who call upon one with a piece of stone about 1½ in. cube, and represent that this is a sample of the stone they have to dispose of. Very few men are capable of judging from these small pieces whether the stone is good or bad: the proper way is to go to the quarries and examine the strata and the quality of the stone generally;

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by so doing one may be able to select stone that will stand the weather.

Corsehill stone is a stone which has been used extensively in London, and if carefully selected from the best strata will stand the weather well. There are, however, some inferior stones in this quarry, but generally speaking I may say that it is a durable stone.

Yorkshire stone is frequently described in specifications without any quarry being named, yet the number of quarries in Yorkshire is too numerous to be mentioned here. This is a very important matter, for the difference between the hard and the soft York is just double the cost in working. Soft York, moreover, is of an inferior quality, and perishes with the frost, while the sun will even lift up the small laminated beds.

Caen stone has caused much disappointment to a great number of people. Many buildings erected of this stone are very nearly perished owing to atmospheric influences, the stone crumbling away like so much dry sand, and being blown away by the wind. I have noticed that it is chiefly the yellow and soft stone which decays thus, there being no silica to bind the particles together. One bed of this stone, which is of a grey colour, is as hard as Portland and very close in texture. This bed, I have noticed, stands remarkably well; in fact, equal to any stone we have in London. Where a building is erected entirely out of this, there is no doubt of its standing the weather well.

In conclusion, I may say that I have thrown out these few observations in order that those engaged in the buying and working of stone may take a little more interest in the important matter of selection, so that the masonry of this country may not be disgraced owing to the use of bad material in our buildings.

WILLIAM CROSS.

SCULPTURED STONES OF THE SAXON PERIOD.

CAMBRIDGE ANTIQUARIAN SOCIETY.

AT a meeting of this society, on the 20th ult., the Rev. R. Burn, M.A., President, in the chair, the secretary exhibited, on the part of the Rev. C. B. Drake, Rector of Teversham, drawings of some trefoil tracery, at the back and sides of the easternmost of the three sedilia in Teversham Church. It appeared to have been covered up in the so-called restoration of the church some twenty years ago; and had been brought to light again a few weeks since. The patterns on the walls were repeated thrice, but were not precisely identical. The work was that of the fifteenth century. Between the sedilia were slender shafts, ending in capitals. On the capitals could be felt mortise-holes, indicating the existence at some-time of small statues. The width between the sedilia was not the same throughout, the innermost one being 1 ft. 6 in. in width. The other two were 1 ft. 11½ in. wide. The easternmost one appeared to have been surmounted by a lofty finial, of which only a portion of the shaft remained. There were other features of interest in the church besides the sedilia.

The Rev. G. F. Browne then proceeded to give a lecture,—illustrated by a number of drawings and tracings,—upon sculptured stones and crosses of the Saxon period in the north of England (Bewcastle, Gosforth, Hexham, Ilkley. Lastingham, Leeds, Ruthwell, Whalley, &c.), The lecturer said (we quote from the report in the *Cambridge Chronicle*) he felt some difficulty from the fact that any one of the places named would supply him with sufficient material for one lecture. His object was, however, to bring home to the minds of Cambridge antiquaries, more than had been done hitherto, the considerable number and very great importance of this group of sculptured stones. The great stones of Scotland, those of the Isle of Man, and of Ireland, and those of Wales, had books to themselves recording their description and history. But the ancient stones of England had no book of their own, and yet, as far as he could make out from a comparative study of the subject, there was no group of stones which spoke to them in the way in which they could make these English stones speak. He would first take them to Bewcastle, in the wilds of Cumberland, the place where Dandie Dinmont was attacked by the robbers. In ancient times Bewcastle was a very important place, an outpost of the Roman wall, and when the frontier shifted from east and west to north and south, Bewcastle remained on the border-line, being, as it were, a sort of pivot. It was, no doubt, a very important station in Roman times. Here was a very magnificent column, 14 ft. 6 in. in height. On one side were three panels, with figures, and a fourth panel filled with runes. On the west side there was interlacing work, of which he showed a specimen from the wonderful cross of Myredach, in Ireland. On another side there was, besides these interlacing panels, a very long one of simple chequers, the only instance he knew of a large panel of chequers. Two hundred years ago the Runic inscription on the column was very obscure, but now it was as clear as possible. The inscription stated that the column was put up in the reign of a certain King Egfrith, in memory of a certain King Alchfrith. That represented the patron of Wilfrid, who first established him in ecclesiastical position, by giving him Ripon, and who died in 664. There was inscribed in the very boldest characters the words "Christ Jesus." There were also on the column letters giving the name of Alchfrith's queen, and the queen's sister and brother-in-law. Mr. Browne next noticed a cross, 17 ft. 6 in. high, at Ruthwell, in Dumfriesshire, which was, no doubt, an Anglian cross, put up when Dumfries was in the possession of the Anglians. At the time of the Reformation the General Assembly ordered that it be taken down as being idolatrous. It was knocked down, but, fortunately, preserved in the church. About 100 years ago it was turned out, and it decayed considerably, but was now taken care of, standing in the minister's garden. One figure on it was no doubt St. John with the Lamb. Two other figures could not be made out. Another figure was that of Our Lord in the attitude of blessing. There were several other figures surrounded by inscriptions in Roman characters; one was supposed to refer to a passage in the life of St. Anthony, when he and Paul the Hermit brake bread. On the other side of the cross were similar panels, and then most exquisite scrolls. On this cross there was no interlacing work at all, and that of course made them ask what could have been its origin, for almost all stones in the north had the same sort of interlacing work, which was found also on the Irish crosses. There could be no doubt that this cross represented the Roman view of ornament, and that the interlacing work represented the Keltic view. He had seen it stated that Roman books were sent over to England by Pope Gregory who, having no artists for illuminating, had to employ a Keltic scribe, a book thus illustrated being sent over to Augustine of Canterbury. But this was a great mistake. Of the two MSS. in Corpus Library, that which was no doubt of the Augustinian epoch had no interlacing work, while the one ornamented with interlacing work was of the seventh century. This cross was covered on the alternate sides with runes, which could still be read. It was quite possible for a casual visitor to look at it and not know that he was looking at a large inscription. The history of these runes was the most interesting in literary discovery. Mr. Browne gave the different readings of the Runic characters which had been made cut by Kemble and others. Kemble came to the conclusion that there was a very beautiful Anglo-Saxon poem engraved on this cross. About that time an Anglo-Saxon manuscript was discovered at Milan, which the Master of the Rolls had copied and printed. It came into Kemble's hands, and he suddenly found the lines which he had deciphered from the runes on the cross. Then he looked through the poem and saw that in it was every stanza which he had found on the cross. There was another most remarkable cross,—that of Gosforth,—with regard to which it was not too much to say that this year had seen a revelation of the language of these stones which no one had dreamed of before. Gosforth was not far from Wastdale. In the course of this year in examining some of the Scotch stones, he had come to the conclusion that it was quite possible that scenes from the *sagas* might be represented on some of these stones. Mr. Browne explained how the figures on several of these crosses had been discovered to be illustrative of Scandinavian legends. One figure represented Christ on the cross, and two curved lines from one side represented, one line the water and the other line the blood issuing from his side. Another figure represented Mary Magdalene, and it was very remarkable that the ointment-box she was represented as holding was in the true shape of an *alabastron* or a cucumber-shaped box, which was snapped across the middle when it was intended to use the ointment it contained. It was by some accident the Scandinavians had got hold of that detail so correctly. The dreadful serpent-like figure depicted up the middle of the cross was opening its mouth at the Trinity, emblematically represented immediately above. In reference to the Ilkley stones, Mr. Browne said they were of course well known to a great many; but he had never seen a real investigation of them. He did not think they would find anywhere more exquisite scrolls over crosses than were on those. The boldness of design and the symmetry of the scroll were beautiful beyond description. On one cross St. John was represented, with the beak and eyes of an eagle. On some crosses were figures of beasts holding up one paw in an attitude of obedience, the object of the design being to show the power which Christ had over those evil spirits represented in early times by these dragons. He thought these stones would repay more consideration than they had yet received. There were some very remarkable stones at Otley. At Collingham were portions of three beautiful crosses. Mr. Browne pointed out drawings of a Keltic cross, dug up at Tadcaster, on the stem of which were symmetrically inscribed a series of circles,—representing the consecrated wafers, with one larger circle representing the wafer used by the celebrant. Mr. Brown next noticed a Saxon tombstone at Thornhill, near Dewsbury, and a very remarkable cross 14 ft. 6 in. high, now preserved in the chancel of Leeds parish church. Professor Stevens, of Copenhagen, agreed with him in his interpretation of the curious design upon this cross, representing Völund carrying off a "Swan-maiden"; such a panel did not exist elsewhere in the whole world. Another panel from Leeds had interlacing work for its pattern. There were thirty interlacings, supposed to correspond with the days of the months. The four divisions of the pattern were supposed to represent the four seasons, while measurements made showed that a line produced diagonally through one upper corner of the oblong would strike the Pole Star, while one produced through the other upper corner would strike the Sun at Leeds at noon. Mr. Browne also gave interesting details about crosses at Hexham, Lastingham, Sinnington, and Kirkdale. In conclusion, he urged that something should be done to record the description of these stones in a book. They were being found in considerable numbers, and those at Gosforth furnished nothing less than a revelation. He thought the University might very well undertake such a task. Everything in the way of Greek or Roman art was represented in this University, and they had in this Society a great centre of enthusiasm. These crosses and stones showed them that their Saxon ancestors possessed a skill of execution and fertility of design which might make us very proud to call them our fathers.

In the course of the discussion which followed, the Rev. Dr. Luard said he thought the Society might, among other things, interfere to prevent an act of Vandalism which, according to the newspapers, was threatened at Sawston by the utilisation of a cross of Barnack stone standing in the middle of the village for the purposes of a lamp-post.

The Chairman assured Dr. Luard that the Society had already done so, and that the monument had been saved.

A vote of thanks was given to Mr. Browne for his lecture.

AN AMERICAN ARTIST'S MANSION BURNED.

AMERICAN papers of the 11th ult. give details of the destruction by fire, on the previous day, of the residence and out-buildings of Mr. Albert Bierstadt, artist, situated at Irvington, on the Hudson. The house was built by Mr. Bierstadt as a summer residence, and is known as "Malkasten," or "Painter's Box." The house was square and built of stone, with four stories and high ceilings. It was erected about seventeen years ago, and its cost and that of the land together was about $10,000. The loss is estimated at $60,000, and is pushed up to the figure by the immense number of sketches which Mr. Bierstadt had stored there, in large part, of California scenes. Mr. Bierstadt, it seems, had not lived in the house for the past seven years. The most recent occupant was Mr. Henry [illegible]man, jun.

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a broker of New York, residing in Brooklyn. Another account says that the building was erected at a cost of 100,000 dols. A studio, 75 ft. by 50 ft., with a ceiling 35 ft. high, was situated in the rear of the second story. All the rooms were spacious. The interior was finished in hard woods. Large Turkish rugs took the place of carpets. The furniture was costly. Nearly every room contained from three to ten valuable pictures of the famous artist. In the library were two pictures of Yosemite valley, valued at $10,000 each. The furniture itself was probably worth $10,000. The pictures and curiosities are estimated to have been worth nearly $100,000 more. These two accounts appear to show a discrepancy of $90,000 as to the cost of the building, and one of $50,000 as to the amount of loss sustained.

YORK ARCHITECTURAL ASSOCIATION.

The project of forming an Architectural Association in York has been successfully floated. The first general meeting was held on Thursday evening last week. Mr. Wm. Brown, architect, presided, when the rules were brought forward, and were, with a few slight alterations, finally adopted. The preliminary arrangements have been energetically carried out by Messrs. Braithwaite, Crunnack, Hepper, Smithson, Yeomans, Smith, Burleigh, Benson, and Tate, with Mr. B. P. Shires as hon. sec.

The first meeting will be held on Dec. 21st, in the lecture-room of the Association, Victoria Hall, Goodramgate, York, upon which occasion Mr. J. Perry will read a paper on "The Present Aspect of Architecture in England."

Elementary and advanced classes of design and construction are being formed, and it is to be hoped the committee's efforts will be rewarded with success, as the new association will supply a long-felt want in the district.

BUILDERS' BENEVOLENT INSTITUTION.

The fifty-eighth election of pensioners on the funds of this Institution took place on Thursday last at Willis's Rooms, Mr. Jno. T. Chappell, President, in the chair. There were six candidates,—five men and one woman, viz., Charles Wood, aged 60 (second application); Robert John Dutton, aged 72 (second application); Francis Drake, aged 67; William Mansell, aged 64; Edward Bagridge, aged 60; and Martha Attwood (widow of James Samson Attwood), aged 72. When the election was arranged for, there were vacancies for two men and one woman, but in consequence of the great success of the recent anniversary festival, the committee decided to elect an additional candidate. The poll was open from two p.m. to four p.m., and shortly after the latter hour the scrutineers (Messrs. Thomas Stirling and T. F. Rider) announced the results of the voting to be as follow:—Drake, 1,794; Dutton, 1,019; Wood, 804; Bagridge, 170; Mansell, 132; and Mrs. Attwood, 43. The chairman therefore declared the successful candidates to be Francis Drake, Robert John Dutton, Charles Wood, and Martha Attwood.

On the motion of Mr. T. G. Smith, seconded by Mr. Rider, a vote of thanks was given to the chairman, who was congratulated upon the fact that owing to the success of his exertions in connexion with the recent anniversary, the committee were in a position to elect an additional candidate. Votes of thanks were also given to the scrutineers and checkers of votes.

The Central Hall of the Houses of Parliament.—Mr. Schreiber, M.P., writes to say that in answer to his question as to what steps the First Commissioner of Works intended to take next session for completing the decoration of the Central Hall, Mr. Shaw-Lefevre was understood to say that he thought it improbable any steps would be taken in that direction. So far as he (Mr. Shaw-Lefevre) could make out, the existing decorations had not given satisfaction, and he did not think the House would wish them to be continued. Upon this Mr. Schreiber gave notice that early next session, unless prevented by the new rules, he should call attention to the continued exclusion of three out of the four national saints,—meaning, of course, St. Patrick, St. Andrew, and St. David,—from their places in the central hall, and move a resolution in favour of their admission.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

5,496. S. Slater, Oldham. Stoves. Nov. 18, 1882.

5,508. L. A. Groth, London. Producing architectural ornaments, &c. (Com. by C. G. Mineur, Stockholm). Nov. 20, 1882.

5,528. E. B. Brooke, Huddersfield. Removing superfluous body and glaze off enamelled bricks and tiles. Nov. 21, 1882.

5,581. E. Hughes, Liverpool. Wood block and other pavements. Nov. 23, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named:—

Nov. 21, 1882.

4,951. J. M. Hart, London. Automatic registering apparatus for closed doors, &c. Oct. 18, 1882.

Nov. 24, 1882.

3,511. W. Wright, Plymouth. Flush cisterns. July 24, 1882.

3,737. B. J. B. Mills, London. Ceramic composition. (Com. by F. Gillet, Paris.) Aug. 5, 1882.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending November 25, 1882.

1,432. W. Bartholomew, London. Flushing tanks. March 24, 1881. Price 6d.

A pipe rises through the bottom of the tank which has a trumpet-mouth. Over this is a bell, which acts as the short leg of the syphon. The pipe terminates in a trumpet-mouth dipping into a box, from which is the outlet to the drain. When the tank is filled a syphonic action is established.

1,749. C. Major, Bridgwater. Roofing tiles. April 12, 1882. Price 6d.

These tiles are constructed with serrated or step-like bodies.

1,785. T. Rowan, London. Ventilating apparatus. April 14, 1882. Price 6d.

This is an improvement on Patents Nos. 5,303 of 1880, 162 of 1881, 505 of 1881, and 5,351 of 1881, in dispensing with cowls for producing the current of air, and fitting a stove through which passes a series of pipes connected with the sewer or drain, &c., while their other ends open into the up-shaft or chimney. By the heat of this stove the current is produced.

1,792. A. W. L. Reddie, London. Ventilators. (Com. by A. Huber, Cologne.) April 14, 1882. Price 8d.

A vertical shaft of tapering form is fitted at its upper end with a truncated pyramid, having five sides and independent upright wind-boards.

1,828. A Smith, Huddersfield. Appliance for securing sliding window sashes. April 17, 1882. Price 2d.

A counterbalanced lever is attached to the lower style, the heavy end of which comes in contact with the upper style. (*Pro. Pro.*)

1,836. W. Walker, New York, U.S.A. Manufacture of artificial stone. April 18, 1882. Price 6d.

The stone is made of sand, cement, sulphur, and potash, and the blocks are hardened by being placed in a chamber and subjected to the action of steam which has been passed through a mass of sulphur.

1,857. W. Blyth, Barton. Manufacture of bricks and tiles. April 18, 1882. Price 4d.

These are pressed in dies, and finished off by hand.

2,047. W. W. Wynne, London. Bridges. May 1, 1882. Price 6d.

To allow the passage of vessels through bridges a portion of the bridge is constructed to be lowered into the water so that the vessel can pass over it.

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

FALL OF TWO RAILWAY BRIDGES.

On the morning of the 24th ult. seven men lost their lives by the fall of a "cross-over bridge" on the London, Chatham, and Dover Railway, near Bromley, the poor fellows whose lives were thus sacrificed being servants of the company. The bridge which fell was an old brick-built one, about a quarter of a mile beyond Bromley station from London, and is stated to have been erected when the line between Bromley and Bickley was in the hands of the South-Eastern Railway Company. It connected private property on both sides of the line, and was for private use only. The London, Chatham, and Dover Company had been employing men in excavating the sides of the line in preparation for necessary widening, and, in the course of this work, the bridge, which was covered with ivy, was noticed to be in an unsafe condition. On the previous night, soon after the Dover Continental express had passed, the centre of three arches across the line fell The break-down gang was brought from London to work at clearing the line, and this was done by daylight on the 24th. A telegram was sent from Bromley announcing that the line was clear, and the first London train out passed by the remaining arches of the bridge while the men were under one of them at breakfast. This arch fell and buried eight or nine of the men, gangers and labourers. Seven of them were brought out dead. The inquest was opened on Saturday last, when Edward Pearce, the forman ganger between Bromley and Bickley, was called. He stated that he was present when the accident occurred. On Thursday he noticed that the road on the down-line side was a "little out of the line,"—that it had widened. He examined the bridge, and, seeing that the pier on the down main line had moved, sent at once for Mr. Archer, the superintendent of that part of the road, the witness meanwhile having the bridge watched. The pier appeared to have gone somewhat sideways. Mr. Archer and the witness examined the bridge together, with the result that a telegram was despatched to the engineer's office at Victoria, and Mr. Hewitt, the assistant engineer, came down. He plumbed the bridge, and then gave orders that it should be strictly watched. Between one and four o'clock the brickwork of the bridge opened at the top, just above the pier on the down line, and cracks appeared. Then Mr. Hewitt came again, and gave orders for the bridge to be taken down. The men worked all night; the arch over the main line, and the smaller arch over the siding on the down-line side, fell without any warning. The arch over the hut on the up side was left standing. The men got the line clear before six o'clock, in time for the 5·55 train to pass. They then went to breakfast, and were warned to be back at 7·30. Some went to Bromley to breakfast, others into the hut. The witness stopped outside to watch the traffic. At 6·52, while he had his back to the bridge, the third arch fell. The pier fell outwards.

The inquiry was then adjourned until this Friday, December 1st.

Colonel Yolland, on Tuesday, opened a Board of Trade inquiry at Bromley in reference to the fall of the bridge. Evidence was taken as to the inspection of the bridge on the day preceding the accident, and the ultimate falling of the structure. The inquiry was adjourned.

A disaster of a somewhat similar character is reported from Scotland. It occurred on the Great North of Scotland Railway, on the Macduff and Turriff branch of that line, and by it five persons have been killed and eleven seriously injured. The accident occurred at a point on the line two miles from Auchterless Station, and about the same distance from Fyvie. The custom of this railway is to run mixed trains of wagons and passengers' vehicles, and the train which left Macduff at 4·20, due in Aberdeen at six o'clock, was of this description, there being three wagons in front of the carriages. After leaving Auchterless the train passes through a level country for about a mile, and at this distance there is a level crossing, called Gatehouse. From this crossing the line rises till it reaches a bridge over the Ythan, a river about 30 ft. wide. A few hundred yards further on there is a bridge across the Turriff turnpike road. It is an old structure, built more than twenty years ago. It is made of iron, with wooden crossbeams, and there is no railing at the edges of it. The height is about 18 ft. from the level of the road, and its length about 40 ft. It was at this point that the accident happened. Telegrams from the spot state that the engine of the train and the guard's van had passed over the bridge in safety, but when the three wagons were crossing the bridge gave way, and the vehicles were precipitated on to the road beneath. The carriages, in which there were a considerable number of passengers, fell into the chasm, and were piled in a heap. The engine remained on the railway about 200 yards forward from the bridge, but the force of the falling wagons had pulled the tender off the line. The line at the point where the accident occurred is carried on the top of a high embankment, and crosses the Forgue turnpike at a height of between 20 ft. and 30 ft. on an iron bridge supported by wooden beams. It is not stated that the bridge had previously shown any signs of weakness; but it is inferred that the long-continued wet weather may have in some degree lessened the solidity of the embankment, and thus, at the same time, have interfered with the stability of the bridge.

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MID-LONDON MARKET.

NOTICE has been lodged of an application to be made to Parliament next session for powers to form a market on some land at the back of the public gardens on the Thames Embankmennt, between Waterloo and Charing Cross Bridges.

This project is rather an extensive one, as, besides erecting markets, it provides for the construction of a new street from the Thames Embankment along the northern side of the public gardens to Villiers-street, which it will join nearly opposite the stairs leading to Charing-cross foot-bridge. There will be outlets from the new street to the Strand by way of Buckingham-street and York-buildings, which have been hitherto *culs-de-sac*, but will now be public thoroughfares.

The market buildings will be arranged on the north side of this new street, in four sections, divided by the intervening streets, but they will be connected together by glazed awnings. Each section will have a ground-floor of 30 ft. high at least, and a lofty basement or lower market beneath, on a level with the Underground District Railway. The Metropolitan District Railway will thus be brought actually into the market by means of a loop-line of rails from Charing-cross Station to a junction near Waterloo Bridge, and the markets will be directly connected with the whole railway system of London and the provinces.

Advantage is taken of the difference in level of about 40 ft. between the Thames Embankment and the Strand, and a high-level roadway in line with Adelphi-terrace is projected to be carried above the back part of the markets, on columns, as far as the houses of Lancaster-place, Waterloo-bridge, with light iron bridges spanning the intervening streets. The market buildings proper will not be raised above the level of the roadway of this terrace, but this terrace will have as a background a row of very lofty buildings, consisting of a large hotel and some blocks of offices and chambers overlooking the market roofs, and forming a connecting link in the river façade between Adelphi-terrace and Somerset House.

The architects are Messrs. Benison & Bargman, of Essex-street, Strand, and the Parliamentary engineer is Mr. E. Wilson, C.E.

DOCKS AND HARBOURS.

Cape Town.—On the 20th of October, the new graving-dock at Cape Town was formally opened, the Union Steamship Company's steamer, *Athenian*, cutting the ribbon and taking up her position in the basin. The water was pumped out of the basin in five hours, and the *Athenian* now lies there shored up, high and dry. The dimensions of the dock are 539 ft. at coping level, 500 ft. at keel-blocks, 90 ft. wide at coping, and 68 ft. at entrance. The depth of water on sill of entrance at low water is 21 ft. and at high water 26 ft. (ordinary spring tides). The blocks are of Poarl granite.

Berwick.—A public meeting of those interested in the proposed fishery harbour at the Green Haven, on the coast about half a mile north of Berwick pier, was held in the Town-hall, Berwick, on the 23rd ult. Mr. W. Henderson read the report of the committee, which stated that they were unanimous in admitting the importance of the proposed harbour to the town and district; that the Duke of Northumberland had agreed to grant the ground at a nominal rent; and the North British Railway Company, the committee believed, would run a branch line to the harbour. It was only proposed to construct section 1 of the harbour, as shown upon the plan, and this could be done at a cost of 24,743*l.*; and as the power of the Harbour Commissioners extended about two miles along the coast to the north they would have to be consulted. The only plan they could see to float the scheme was to get at least one-half of the amount required, and they thought that if they could raise 15,000*l.* they might get a loan of the rest. They thought such a scheme might be considered and tried. Alderman A. Darling, as chairman of the committee, said they had been very fortunate in securing the services of Mr. J. Watt Sandeman as their engineer, and he had produced a large and comprehensive plan. He moved the adoption of the report, and that steps should be taken to carry out the scheme. The motion was agreed to, and a committee was appointed to promote the scheme.

Lerwick.—At the annual meeting of the Lerwick Harbour Trust, on the 22nd ult., with reference to the opposition of Mr. George Hay to the alterations which have been made in the works, which chiefly consist in carrying the pier out from the shore as a solid work, instead of making a connexion with the shore by means of a bridge, a letter was read from Mr. Hay's agents in Edinburgh (Messrs. Mackenzie & Kermack) intimating that the harbour plans had been examined on behalf of Mr. Hay by a firm of engineers, who stated that in their experience they had never seen such a deviation, as was here proposed, from plans authorised by Parliament, and assuring them that the alteration is not authorised by anything within the limits of deviation described in the deposited plans, being simply a substitution of one kind of work for another. It was decided to intimate to Mr. Hay that the trustees were willing to undertake, but without prejudice as to their claim on the pier, that the depth of water at Hay's pier would be maintained, and that the contract for the erection of the works would be ready for signing at an early date.

COMPETITIONS.

The Wallace and Bruce Statues, Edinburgh.—The sub-committee of the Lord Provost's Committee on the Wallace and Bruce Memorial met on Tuesday last, and decided that none of the competitive designs previously noticed were of sufficient merit to justify them in recommending the Town Council to proceed to carry out the bequest of the late Hugh Reid. In acknowledgment of the trouble to which the competitors (eight in number) had been put, they agreed to recommend that each should receive the sum of 10*l.* They further recommended that, in the meantime, the Reid Bequest money should be allowed to accumulate.

COMPENSATION CASE.

CLOSE *v.* METROPOLITAN BOARD OF WORKS.

ON Wednesday last, at the Sheriff's Court, Westminster, before Mr. Under-Sheriff Farrer and a special jury, the case of Close *v.* Metropolitan Board of Works, was heard.

This was a case in which the question to be determined was the amount to be paid by the Metropolitan Board of Works for the freehold premises of Mrs. Close, No. 3, Moor-street, Soho, taken for the new street from Piccadilly-circus to Oxford-street, and for compensation for disturbance of her business as a baker. The amount claimed was 4,790*l.*,—viz., 2,200*l.* for the freehold property, 2,500*l.* for damage to business, and 90*l.* for fixtures.

The evidence for the claimant consisted of that of Mrs. Close and other witnesses who had examined the books, and they calculated the profits of the business at 518*l.* per annum, on which five years' purchase was claimed.

Various estimates of the value of the freehold were given.

On behalf of the Metropolitan Board of Works, Mr. Dwarber, Fetter-lane, made out the profits to be only 320*l.* a year, and it was maintained that only 1½ year's purchase should be given,—say, 500*l.*

As to the freehold, the witnesses put the value at 1,540*l.*,—making 2,040*l.* altogether.

Counsel on each side having addressed the jury, the Under-Sheriff summed up, and the jury found a verdict for 3,375*l.*

REMOVAL OF STREET SLUSH.

SIR,—In a recent issue you mention the trial of new watering and sanding machines in London.

Along with these there is much need of a more economical and expedient way of removing slush than that employed at present, viz., shovelling it into open carts in the thoroughfares. Such a method is certainly not in keeping with progress, when other means are at hand.

The vacuum cylinder or drum is not a thing of to-day. It has been used in a Northern city for removal of the contents of urinals, &c. While the machine is being driven along it works an air pump, which forms a vacuum in the cylinder. When a certain vacuum is reached (which is shown by a gauge), an iron pipe, with india-rubber hose connexion, is let into the sunken hogshead or tank; then the tap is opened, and the whole contents rush up into the cylinder without any splashing or inconvenience whatever to the traffic.

If such a machine was thought too complicated, there are plenty of chain or india-rubber valved pumps made to pump slush that could be fixed to the back of water-tight carts, and worked by hand, which could easily remove the contents of any slush-receptacle. T. T. L.

OLD FORD ROADS.

SIR,—What is the General Rate? The demand-note says, highways, cleansing, lighting, &c. Surely this is wrong, as a visit to Monier-road, Old Ford, will show.

The road is certainly indifferently lighted, but the cleansing appears on paper only, for both road and pathways are nothing but mud, slop, and slime. The slop lays in the road until it is covered with a green slime.

Is this conducive to the health? I suppose when an epidemic breaks out we shall have inquiries and inquests. Then things will be altered. Is not prevention better than cure? H. SMITH.

INDEX TO THE *BUILDER*.

SIR,—Ten years ago a suggestion was made in the *Builder* that, with thirty years of existence, a complete index for the time being was absolutely necessary to all those who had to search its pages for information they might be in need of.

This necessity is rendered still more pressing now that another ten years of much bulkier matter has been added. Cannot this complete index be compiled by a staff of volunteers? I think they might be found, and that the sale would guarantee the venture. T. P.

CLIFF & SONS *v.* COTTRELL.

SIR,—Our attention has been called to the report of the above case in your issue of the 25th ult., and as it is calculated to convey an inaccurate impression of the grounds of the verdict, may we request you to give publicity to the fact that the case was decided on a technical point that the bricks delivered did not correspond with the exact description ordered,—a matter on which there was a quantity of conflicting evidence?

SCATCHERD & HOPKINS,
Solicitors for the Plaintiffs.

Books.

Greece, Pictorial, Descriptive, and Historical. By CHRISTOPHER WORDSWORTH, D.D., Lord Bishop of Lincoln. A new edition. London: John Murray.

THIS is a handsome republication of an old work, the title of which, we may observe, is very absurdly worded, implying that it is Greece which is "Pictorial, Descriptive, and Historical," whereas it is the book which is understood to have those qualities. It is surprising that so good a scholar as the Bishop of Lincoln should originally have permitted such an illogical arrangement of words on his title-page. However, if there is little in a name, there is not, perhaps, much more in a title-page, and the re-publication of a book containing in one large volume so much in the way of description, comment, and pictorial illustration about Greece will probably be welcome, as the book has become one of that class of which it is said that "no gentleman's library can be considered complete without it," and the new generation may wish to supply this deficiency in their shelves. It is hardly to be supposed that a book on Greece published a good many years ago will be in its illustrative department equal to what is expected now in a book on such a subject on a large scale; better illustrations are found in many much cheaper books at the present day. But the general view of the history, aspect, and associations of the country, given by a man of extensive learning and refined mind, retains its value, and the rather old-fashioned style of the illustrations is a not unpleasing reminder of earlier days, and an interesting example in regard to the change which has come over book illustration of late years. The book is prefaced by a long introductory chapter, or rather essay, on the characteristics of Greek art, by Mr. Geo. Scharf, which he has revised, and to which, we imagine, some new illustrations have been added; we have not the original edition by us for comparison. We may presume that some care has been expended in the revision of this part of the work, on bringing the information up to the level of the present standard of knowledge, though we do not see any reference to the new theory as to the method of lighting the Parthenon. The present editor, Mr. H. F. Tozer, has added a few paragraphs in their proper places, relative to the recent discoveries at Mycenæ, Olympia, and elsewhere; and this he has done with great care and judgment, so that the interpolated passages appear to come in naturally and as if part of the original work, and no "joinings" are perceptible. A view of the street of tombs on the road from Athens to Eleusis is one addition to the illustrations. Binding and paper are all that could be wished,

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and the book may be recommended to the notice of the many persons who do not possess a copy of the original edition, as well as to libraries, private or public, in course of formation.

The Metropolitan Building Acts: a Text-book for Architects, Surveyors, Builders, &c. By Banister Fletcher, F.R.I.B.A. London: B. T. Batsford, High Holborn. 1882.

The edition of the Metropolitan Building Act published by Mr. Banister Fletcher some years ago being out of print, he has issued another with the addition of recent additional Acts of Parliament and other necessary matter,—the Amendment Act of 1878, the General Orders published by the Board of Works, and the most recent information as to liability in respect of the paving of new streets and the local management Acts. To save his readers the trouble of referring from page to page and to foot-notes to find all the information that relates to the same matter, Mr. Fletcher has sought to bring all the information together, including cases that have been settled, the majority quoted from our own pages. While this has a certain usefulness, the user of the book must be careful to distinguish between what is the actual law and what are merely the opinions of the writer and quotations from newspaper reports, which have no weight in court. They afford, nevertheless, much valuable information.

The Magazine of Art. Vol. V. Cassell, Petter, & Galpin, London, Paris, and New York. 1882.

The volume for 1882 of this art-periodical contains a good many articles of interest, and a large number of mostly good illustrations. Architecture and ornamental art are fairly represented among the papers contributed. In an article on "The Venice of Titian" (a very interesting subject) by Mr. Wyke Bayliss, the point is, however, rather missed by the mistake of drawing the illustrations so as show the buildings looking like old ones, which were comparatively new in Titian's day; a curious mistake, as one would have supposed the very object of such an article should have been to show sketches and suggestions of Venice as the place would have looked at that date. An article on the New Law Courts by Mr. W. Armstrong is noticeable as being one of the few attempts we have seen to form a reasonable critical judgment of the building. Mr. Armstrong, while writing with cordial appreciation of some of the detail of the building, has the independence to speak strongly as to what he calls the "almost malicious disregard of symmetry" in many parts of the building. He goes on to say,—"There are six towers all different, though all of very squat proportions; there are eight façades, counting those in the great or eastern quadrangle, and they are all, with the doubtful exception of that which faces Clement's Inn, broken up into so many parts and into such unsymmetrical masses, that no one of them is much more expressive than if it were made up of half a dozen buildings by as many different architects. Such want of coherence was appropriate enough in the great Mediæval buildings upon which Mr. Street has modelled his art. They were usually the work of several generations, and as they received successively the impress of many directing minds, their irregularity was a natural growth, and was as true in expression as it was picturesque. In these days of what may be called Romantic architecture, it is too often forgotten that a picturesque *ensemble* is in its very nature irreconcileable with a great artistic conception. The latter cannot exist without unity, symmetry,—in a word, without individuality; but the qualities which make a building picturesque are identical with those which deprive it of individual expression." We are not sure that Mr. Armstrong has used quite the right word here, unless he means the word "individual" to be taken in its more literal sense, as denoting a building which must be considered as a whole and not in divided portions. It is not impossible for an architect to design a picturesque building which may show his own individuality of taste. It would have been truer to say that a great conception will be homogeneous, and what is usually called a picturesque building is not so. "His meaning is goot," however, and we are glad to find a thoughtful artist like Mr. Armstrong concurring in the views about the Law Courts building which had been already expressed by ourselves.

Mr. Champneys has contributed one or two articles on Wren and his works; there is one on Alnwick Castle; and among articles on decorative subjects is one by Mr. G. Wallis on "Decorative Ironwork," with some illustrations of very piquant and charming ancient designs of various types. The affectation at the close of this article and in other places of shading part of the page so as to make it appear as if it were a separate leaf pasted in and curling up from the background, is a piece of foolishness which should be avoided in future. Among miscellaneous contributions is a very well written paper, by Mr. R. L. Stevenson, on Bagster's illustrated edition of the "Pilgrim's Progress," with reproductions of some of its small and quaint anonymous woodcuts. We entirely agree with Mr. Stevenson as to the suggestive interest of many of them; they were quite worth calling attention to; those illustrating "The Chamber called Peace" and "The Enchanted Ground," and one or two others, are almost worthy of Blake.

VARIORUM.

Longman's Magazine, No. 2, has a considerable instalment of a serial story, by Jas. Payn ("Thicker than Water"), and contributions by Samuel Smiles, R. A. Proctor, J. A. Froude, Mrs. Oliphant, and others. If kept up to this mark it can scarcely fail to succeed.——The *Gentleman's Annual*, Christmas, 1882 (Chatto & Windus), includes four stories, all pleasant reading, the principal one, "Day and Night," being by Mr. Francillon. —— The *Belgravia Annual* for Christmas (same publisher), contains matter of the same kind, with the addition of a number of illustrations.——The *Ship Canal Gazette*, just now produced, is devoted to the movement having for its object the constitution of Manchester as a port for ocean-going vessels. This would seem to show that the movement is a wide one. —— Arrowsmith's "Christmas Annual" for 1882 has the title of "Brown Eyes," by May Crommelin, and is a pleasantly-written and stirring story.——"The Bow of Strength" is the title of the *Quiver* Annual for 1882, and with its coloured cover and many woodcuts certainly a good sixpennyworth. ——Then comes "Our Happy Family," the *Little Folks'* Annual, Harrison Weir and Ernest Griset being chief amongst the illustrators.—— Cassell's *Illustrated Almanac* for 1883 has a good print on every other page, and sometimes more.

CHRISTMAS CARDS.

Eyre & Spottiswoode have sent us a long catalogue of the cards published by them for the coming Christmas and New Year, and a specimen packet. Executed under the manager of last year, Mr. W. G. Wallis, and in many cases by the same artists, the results, so far as we see, are entitled to the same praise we gave on that occasion. The sale of such cards appears to be ever augmenting: every shop-window in some parts of town is full of them.

Miscellanea.

The New Scottish Conservative Club-house, Edinburgh, was opened by the Marquis of Salisbury on the 23rd ult. The club, which was founded at a meeting held in 1877, originally started with a membership of 1,000. The number has been increased from time to time, and as the limit was exceeded by the applications, recently the club adopted a resolution to increase the membership to 2,000. The constantly-growing membership rendered the temporary premises first occupied inadequate, and the erection of a new club-house was found necessary. In the summer of last year building operations were begun. The site has a prominent frontage in the centre of Princes-street. The design was furnished by Mr. Robert Rowand Anderson, A.R.S.A.

Didcot, Newbury, and Southampton Railway.—The directors of the Didcot, Newbury, and Southampton Junction Railway, at a meeting held a few days since, resolved that the works at Southampton should be commenced as soon as the specification and plans (now in active preparation) are completed. For these (with the exception of earthworks) tenders will be invited from local firms. [illegible] for the general construction of [illegible] in the hands of Messrs. Falk[illegible]

The Health of the Army of Occupation in Egypt.—We learn that with the view of maintaining the health of the 11,000 or 12,000 troops now in Egypt (of whom about 9,000 are in Cairo and 2,500 at Alexandria), the barracks both at Cairo and Alexandria are undergoing a thorough painting and cleansing. They are mostly lofty buildings, but, as is well known, they were in a condition of horrible filth and dirt when first entered by our men. The sanitary arrangements in these buildings have been improved as much as possible, and the "dry-earth system" has been resorted to and applied in the manner practised in India. The hospital accommodation at Cairo was at first, owing to the condition in which the public buildings were found to be, hardly sufficient, but the cleansing process having been now completed, it is stated to be ample for all probable contingencies. In the citadel there is room for some 280 beds. The situation of this place, which is the highest in Cairo, is well suited for the purpose, and the rooms are lofty and well ventilated. At Abbasieh there is a second hospital of 300 beds, and at Ghezireh there is a third; but this is a tent-hospital, and it is capable of holding a varied number. There is a building near Abbasieh which is being prepared for a hospital; it is an isolated place, and is reported to be suitable for the purpose. At Alexandria the principal hospital is a building, consisting of four large sheds, facing the sea, which will hold 300 beds, and it is contemplated to supplement it by the equipment of a hulk hospital capable of holding 200 patients.

The New Works of the Metropolitan Railway Company, Neasden. — The new works at Neasden for the Metropolitan Railway Company have been completed. The second portion of the contract was placed in the hands of the firm of B. N. Smith & Son, contractors, The Crescent, Birmingham, who commenced the work in November last year. Since that time upwards of four million bricks have been laid. The buildings, which are of a substantial description, cover nearly six acres of ground, and consist of the following blocks:—General engineers' offices, builders' workshops, permanent way and signal shops, locomotive shops, erecting, fitting, and turning shops, boiler-house, carriage and carriage-painting sheds, stoves, drying-sheds, gas-house, saw-mills, &c. The whole of the work has been carried out under the superintendence of the engineer to the company, Mr. J. Tomlinson, jun., who is to be congratulated upon the quality of the work turned out under his hands; and the contractors also deserve credit for the expedition with which the whole of the job has been completed, under the sole direction of their able and energetic manager, Mr. Henry Charlton. The whole of the ironwork, viz., columns, girders, and roof-work, has been executed by the firm of Messrs. Stanley, Hall, & Co. In connexion with the above works, and to celebrate the completion of the contract, a dinner was given by the contractors at the Spotted Dog Hotel, Neasden, when about forty sat down, and a most enjoyable evening was spent.

Fire at Clevedon-court, Somerset.— On Monday morning the residential portion of Clevedon Court, Somerset, the seat of Sir Arthur Hallam Elton, was entirely destroyed by fire, believed to have originated with a beam in one of the chimneys becoming ignited. The Court was one of the few old manor-houses that continue to be used as such. Dating from the time of Edward III., it was restored in the Tudor period, and though it had since been restored and altered, many of the old rooms and offices were perfect. The south front, with its traceried windows, quaint gables, and variously ornamented window-shafts, has been saved, with the entrance-porches and grand hall. It is stated that the occupants of the Court had been a little alarmed for two days past by the smell of smouldering wood in some of the rooms, but all efforts to discover the cause of it had failed. Early on Monday morning the library fire was lighted, and about eight o'clock a servant went to light a fire in a spare room over the library, and found it full of dense smoke. Hastening into an adjoining room, she discovered that it was in flames. A good many of the books were saved, with some valuable title-deeds and ancient manuscripts.

Chiswick.—We understand that Mr. Henry Oliver Smith, C.E., has resigned his appointment as Engineer and Surveyor to the Chiswick Improvement Commissioners in favour of private practice.

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Demolition of the Camberley Obelisk.—The *Reading Mercury* says that this obelisk, one of the oldest landmarks to be found in that part of the country, has just been partly demolished. The obelisk could be seen for miles round, and has for about a century been a guide to travellers. It appears that the gentleman who has recently bought "The Knoll" on which it stands has had the building surveyed by Mr. Allcock, contractor, Camberley, who has pronounced it unsafe at a point about 40 ft. down. The owner consequently ordered its removal down to the defective part. The contractor obtained some good photographs of this interesting relic before commencing the work of demolition. Popular tales say the obelisk was built by a king for the purpose of watching fox-hunting, another similar story stating that it was put up as a landmark for fox-hunters, while other accounts declare it to have been a signal station. The authentic particulars, which are not generally known, are that it was built by a Mr. Norris (who lived at Hawley House, Blackwater), in order to communicate by flags with High Wycombe Church, in Buckinghamshire (twenty-seven miles as the crow flies), with the Dashwood family, with whom he was very intimate. There was originally a gallery round the top, and a ball on the summit. About the time when the Royal Military College was removed from Marlow to Sandhurst (in 1812 or 1814), the obelisk formed a favourite landmark for drivers after leaving Wokingham. As there were at that time few trees about, it was much more prominent than it has latterly been. Some gipsies who encamped in the obelisk, and lighted a fire, are said to have burned the staircase down.

English and American Locks.—The *Irish Manufacturers' Journal* says,—"An English merchant who was asked 5 per cent. advance on last years' prices for English-made locks objected, adding that 'English lockmakers would not be so ready in advancing prices if they knew what large orders I am sending to America by mail,' and admitted, on being questioned as to what advance in price those orders were subjected, that it was 45 per cent. Thereupon a local correspondent regretfully writes, this is not an isolated case, nor is such experience limited to the lock trade, and that "it seems to be the fashion among certain English merchants to beat down the price of the manufacturers to a semi-starvation point and to give, without a murmur, whatever price the Yankee rival likes to charge.' Now, the fact is that for years the English locks for general use have been of the poorest kind of make, so unreliable and dear-at-any-price, that the entrance long since of the well-made and trusty Yankee locks into successful competition was easily made and has been easily retained. It is all well enough to blame the English merchant, but '44 per cent.' never suits him without a very good reason indeed for it."

Bishop Heber's Bath.—The neglected state of the bath at Trichinopoly, in which Bishop Heber lost his life, and the subject of the preservation of this most interesting relic, having been brought under the notice of the Government, the Right Hon. the Governor, who in July last personally visited the locality, has decided that the bath should be protected by an ornamental iron railing, placed at a sufficient distance to prevent interference with the water. The bath is to retain its original character, and arrangements are to be made for keeping it always full and properly conserved. Mr. Grant-Duff has also directed the following inscription, drawn up by the Bishop of Madras, to be carved on a slab, and erected on the side wall:—"In memory of the devoted, accomplished, beloved, and universally honoured Servant of God, Reginald Heber, D.D., third Bishop of Calcutta, and one of India's truest and most loving Benefactors; this Stone was erected in the year 1882, at the expense of Government, on the margin of the bath in which he was drowned while bathing on the 3rd of April, 1826. His body was laid under the chancel of the Church of St. John, Trichinopoly, in the hope of the resurrection of the just to eternal life through Jesus Christ."—*Pioneer.*

The Civil and Mechanical Engineers' Society will hold their opening meeting of the session 1882-3 on Thursday, December 7th, when the president, Mr. R. Harkness Twigg, M.I.C.E., will deliver his opening address. This Society offers many advantages, more especially to the younger members of the profession.

Fatal Scaffold Accident at Hungerford. A terrible accident which happened to a stone-carver named William Finlay, at the new London and County Bank buildings, on the 10th ult., has unhappily terminated fatally, the poor man having died at midnight on the 20th ult. from the effects of his injuries. On the 21st an inquest was held before the borough coroner. Henry Hart, stone-carver, of Clapham-road, London, said deceased was forty-two years of age, and was a very nervous man, and subject to giddiness, but he was careful, and no serious accident had previously befallen him. William Grimes, of Sunninghill, apprentice plasterer, who was at work in the top front room at the time of the accident, said he saw deceased walking timidly on two planks resting on carpenter's stools, and from these he stepped down, left foot first, to a platform about 2 ft. lower. Immediately he did so he went through and fell to the bottom, about 30 ft. He did not jump, but stepped gently from the planks to the platform. Richard Wells, labourer, who was at work on the scaffold, said he heard the crash, and on looking saw deceased disappear and strike against another platform lower down, from which he rebounded and fell to the ground, being struck in the back as he fell. Witness believed the plank to be perfectly safe, and said stones weighing 4 cwt. or 5 cwt. had been hauled up on to it. The jury found a verdict of accidental death, and that no blame attached to any one in connexion with the sad event.

The Water Supply of Edinburgh.—At a meeting of the Royal Scottish Society of Arts on the 27th ult., Mr. Alex. Leslie, M. Inst. C.E., read a paper on "The Water Supply of Edinburgh." Mr. Leslie, after stating that the city is now in possession of a supply of water inferior to none in quantity, quality, and cheapness, gave some particulars regarding the history of the water supply of Edinburgh, from the inauguration of the first gravitation supply in 1681, before which time Edinburgh had to rely on wells. He also detailed the Parliamentary proceedings which led up to the appropriation of the present supply from Moorfoot. Going on to describe in detail the various Moorfoot works, he mentioned that the area occupied by Gladhouse reservoir was 390 acres, and that it was capable of containing 1,700 million gallons, while Portmore had an available capacity for 250 million gallons. It was estimated, he said, that when the whole of the works were completed, there would be an available supply of 17 million gallons per day, or double what the maximum supply was before the Moorfoot water was introduced. Alluding to a prophecy that had been made, to the effect that the presence of large accumulations of water in the various districts would be damaging to the surrounding properties, by causing cold, damp winds, he stated that this view had been found to be erroneous; and that the farmers were of opinion that the land was benefited by the presence of the water, inasmuch as they found that the frost was much less intense than formerly.

Proposed Market for Chelsea.—It is intended to apply to Parliament for powers to erect a new market in the Fulham-road. The site lies between Sydney-street and College-street. The inhabitants ought to keep their eyes open.

Eastbourne Proposed Town-Hall.—If we printed what is sent to us on this matter we should be liable to an action for libel. Suffice it that the matter is at present at a dead-lock. The plans are said to have been insufficient for the quantity-surveyor.

Midland Great Western Railway of Ireland.—Mr. G. Newenham Kelly, C.E., has been appointed by the directors as chief engineer of this company, in succession to the late Mr. R. R. Greene.

TENDERS

For premises in Blackfriars-street, Manchester, for Messrs. John & James Carr & H. G. Nicholson. Mr. E. S. Titmas, architect, 48, Arcade-chambers, St. Mary's Gate. Quantities supplied by Mr. J. H. Andrews:—

Carlyle	£16,309 0 0
Parkinson	16,200 0 0
Acton	15,840 0 0
Wilson, Toft, & Huntley	15,462 0 0
Davies & Maudsley (withdrawn)	15,317 0 0
Webster (revised)	14,700 0 0
Brown & Sons	14,700 0 0
Niell & Sons (revised)	14,400 0 0
Southern & Sons* (revised)	14,310 0 0
Herd (revised)	14,303 0 0
Macfarlane (too late)	14,000 0 0

* Accepted.

For the erection of a new Training College, Saffron Walden, for the British and Foreign School Society. Mr. Edward Burgess, architect, 39, Great James-street, London. Quantities by Mr. Wm. Thornicroft:—

Giles Bros.	£15,950 0 0
Frost & Co.	11,950 0 0
D. S. Rice	10,818 0 0
J. Sharman	10,590 0 0
H. Everett & Son	10,490 0 0
T. Glasscock & Son	10,400 0 0
D. C. Jones & Co.	10,380 0 0
B. E. Nightingale	10,292 0 0
G. Dobson	9,980 0 0
W. Bell & Sons	9,978 0 0
G. Grimwood & Sons	9,890 0 0
D. Dix	9,777 0 0
T. H. Kingerlee	9,640 0 0
G. Thackray & Son	9,389 0 0

For the erection of a new school in Willow-street, Leicester, for the Leicester School Board. Mr. Edward Burgess, architect. Quantities by Mr. W. Thornicroft:—

T. & H. Herbert	£3,650 0 0
Bland	3,497 0 0
Plant	3,489 0 0
Hutchinson & Son	3,376 0 0
F. Major	3,467. 0 0
J. C. Kellett	3,300 0 0
Clark & Garrett	3,270 0 0

For building eight cottages on the estate at Darenth, for the Managers of the Metropolitan Asylum District. Messrs. A. & C. Harston, architects, 15, Leadenhall-street:—

Thomerson & Son	£3,530 0 0
Wenham	3,313 0 0
Crockett	3,235 0 0
Tongue	3,150 0 0
Shurmur	2,970 0 0
Hearle & Son	2,883 0 0
Balaam Bros.	2,875 0 0
Gumbrell	2,805 0 0
Blake	2,690 0 0
Lonergan	2,624 0 0
Priestley & Gurney	2,594 0 0
Brightmore	2,547 0 0
Richardson	2,543 0 0
Waite, Dartford (accepted)	2,108 15 6

For the reconstruction of the drainage of the Workhouse and Infirmary, Marloes-road, for the Guardians of Kensington, according to specification and schedule of prices prepared by Messrs. A. & C. Harston, architects, 15, Leadenhall-street:—

	Percentage above Schedule Prices.	At Schedule Prices.	Percentage under Schedule Prices.
J. Phillips	17½	—	—
Nightingale	15	—	—
Lavers	—	at	—
Mowlem & Co.	—	at	—
McKenzie, Williams, & Co.	—	at	—
Crockett	—	—	5
Standan	—	—	5
Nowell & Robson	—	—	5
Bottoms Bros.	—	—	6
Kellett & Bentley	—	—	10
Bentley	—	—	12½
Beach	—	—	15
Mears, Hammersmith*	—	—	20

* Accepted.

For alterations and repairs to Marlesford Lodge, Hammersmith, for the Managers of the Kensington and Chelsea School District. Messrs. A. & C. Harston, architects:—

Nightingale	£573 0 0
Nash	530 0 0
Crockett	510 0 0
Shearman & Son	482 4 0
Lavers	404 0 0
Derby, Limehouse (accepted)	385 0 0

For shop-fronts, High-street, Stoke Newington. Mr. H. J. Newton, architect, 27, Great George-street:—

Lamble	£228 0 0
Royal	226 0 0
Maton	221 0 0
Cork	216 0 0
Pickersgill Bros. (accepted)	213 0 0

For new Wesleyan Sunday Schools, Harpur-street, Bedford. Messrs. Usher & Anthony, architects and surveyors, Bedford:—

E. Twelvetrees, Biggleswade	£2,995 0 0
T. Spencer, Bedford	2,598 0 0
S. Foster, Bedford	2,497 0 0
Corby & Freshwater	2,471 0 0
Adams, Warton, & Walker*	2,376 0 0

* Accepted.

For alterations at Woburn Sands, Beds, for Mr. Henry Down. Messrs. Usher & Anthony, architects:—
S. Foster, Bedford (accepted).

For the erection of the Church of St. Anne, Bagshot. Mr. H. A. Cheers, architect:—
Joseph Higgs, Upper Park-place, London (accepted).

For alterations, additions, and repairs to the Mission Hall, St. Anne's-road, Stamford Hill. Mr. Jesse F. Scott, architect:—

H. Brown	£580 0 0
F. W. Smith	496 0 0
W. Shurmur (accepted)	495 0 0

For shop-front, 118, High-street, Stoke Newington, for the Incorporated Society of Licensed Victuallers. Mr. H. J. Newton, architect:—

W. Shurmur	£169 0 0
Langmead & Way	163 0 0
Pickersgill Bros.	149 0 0
Cook	148 0 0

For new brewery offices, for Mr. J. Smith, Tadcaster, near York. Messrs Scamell & Colyer, architects, 18, Great George-street, Westminster. Quantities by Messrs. R. L. Curtis & Sons, London:—

Building.

Armitage & Hodgson, Leeds (accepted)	£3,495 0 0

Ironwork.

Dawson & Nunneley, Leeds (accepted)	£393 0 0

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For the erection of schools for the Sutton School Board. Messrs. Gordon & Lowther, architects, 1, Guildhall-chambers, London :—

Tribe	£10,060	0	0
Gregory	9,992	0	0
Ward	9,907	0	0
Merritt & Ashby	9,885	0	0
Smith & Bulled	9,835	0	0
Humphris	9,789	0	0
Loe & Son	9,730	0	0
Hobbs	9,523	0	0
Pearson	9,497	0	0
Clarke & Bracey	9,483	0	0
Prebble	9,396	0	0
Stewart	9,338	0	0
Deacon & Co.	8,996	0	0
Keal	8,862	10	0
Potter (accepted)	8,849	0	0
Longley	8,780	0	0
Dawson	8,590	13	0
Arney	6,368	0	0

For war house at Limehouse, for the Oil-Seed Crushing Company (Limited) :—

Perry & Co.	£3,165	0	0
Crabb	2,700	0	0
Miller	2,650	0	0
Adcock	2,632	0	0
Bovce	2,590	0	0
Scott	2,549	0	0
Stiff	2,488	0	0
Smith	2,400	0	0
Abraham	2,380	0	0
Johnson	2,359	0	0
Holland	2,352	0	0
Parrish & Hawker	2,325	0	0
Russell	2,300	0	0
Tarrant & Son	2,294	0	0
Hunt	2,290	0	0
Beach	2,267	0	0
Hawkings	2,220	0	0
Capsey	2,175	0	0
Bentley	2,084	0	0
Croaker	2,075	0	0
Shurmur	2,070	0	0
Salt (accepted)	2,045	0	0
Ford (informal)	—		

For Crouch Hall road and sewer, on the Crouch Hall Estate of the Imperial Property Investment Company (Limited) :—

F. A. Jackson & Son	£2,900	0	0
Jas. Bloomfield	2,520	0	0
McDowell & Dawson	2,360	0	0
John Bell	2,349	0	0
Jesse Jackson	2,322	0	0
J. Pizzey	2,282	0	0
T. G. Dunmore	2,281	0	0
J. Strachan & Co.	2,150	0	0
W. Nicholls	2,054	0	0
McKenzie, Williams, & Co.*	2,033	0	0

* Accepted.

For reconstructing the County Hall, Bala. Mr. G. C. Richardson, architect, Warwick House, Shepherd's Bush, and Llangollen. Quantities by the architect :—

Samuels, Wrexham	£1,744	0	0
W. Jones, Portmadoc	1,650	0	0
Jones & Son, Criccierth	1,555	0	0
Jenkins & Jones, Johnstown, Ruabon	1,468	6	0
Meakin & Dean, Bala	1,442	0	0
Evans & Morris, Llangollen	1,381	0	0
W. & G. Thomas, Oswestry	1,349	0	0
Evan Jones, Bala*	1,313	0	0

* Accepted, subject to certain reductions.

For alterations and additions, 55 and 56, Pall-mall, for Messrs. Cater & Co. Mr. John Scott, architect :—

W. Crockett	£1,950	0	0
W. A. Rhodes	1,760	0	0
Wall Bros.	1,750	0	0
Hermon	1,747	0	0
C. Ansell	1,697	0	0

For foundations, for Messrs. Hillman, Herbert, & Cooper, Premier Works, Coventry. Mr. E. J. Purnell, architect :—

Hallam, Coventry	£230	0	0
Garlick, Coventry	215	0	0
Haywood, Coventry	196	0	0
Smith, Kenilworth (accepted)	169	10	0

For fitting shop, offices, &c., for Messrs. Hillman, Herbert, & Cooper :—

Marriott, Coventry	£2,100	0	0
Haywood, Coventry	1,800	0	0
Smith, Kenilworth	1,795	0	0
Garlick, Coventry (accepted)	1,385	0	0

For high level sewer 12-in. pipes, in the Dovercourt-road, for the Council of the Borough of Harwich. Mr. Ditcham, borough surveyor. Quantities supplied :—

Betts & Gillingham, Clacton-on-Sea	£1,389	0	0
J. W. Neave & Son, London	1,356	0	0
Hoare & Son, London	972	0	0
Jas. C. Trueman, London	875	0	0
E. S. Gunn, Harwich	749	0	0
Saunders & Son, Dedham	685	0	0
W. Wood, Chelmsford	685	0	0
Capsey, Stamford Hill	683	0	0
R. Nicholson, Southend	650	7	7
Wm. Nicholls, Wood Green	640	0	0
John Moran, Harwich	606	6	11
H. L. Wright, Peckham	598	10	0

For alterations and additions to the Presbytery, St. Mary's, Chislehurst, for the Right Rev. Monsignor Goddard. Mr. E. Ingress Bell, architect :—
H. Balding (accepted).

For alterations and new shop-front to 35, Brewer-street, Regent-street, for Mr. Austin. Messrs. Nylson & Long, architects, 21, King William-street, Strand :—
R. A. Lamprell, Brixton (accepted).

For new shop-front and fittings at Strutton Ground, Westminster, for Messrs. Kearley & Co. :—
R. A. Lamprell, Brixton (accepted).

For additional rooms to Milverton, Burgess Hill, for Mr. Thos. Cracknell. Messrs. R. S. Hyde & F. W. Hyde, architects, Brighton :—
S. Norman, Burgess Hill £270 0 0

For new stables, &c., at Burgess Hill :—
S. Norman £280 0 0

For roadways and sewers, Sutton Court Estate, Strand-on-the-Green. Mr. E. F. Roberts, architect, 3, The Grove, Hammersmith :—

	Contract A.			Contract B. For completing roads, pathways, &c.		
Hollingshead	£1,211	0	0	£1,038	0	0
Johnson	1,189	0	0	1,010	0	0
Alldred	1,098	0	0	953	0	0
Carter	847	0	0	1,121	0	0

TO CORRESPONDENTS.

C. W. M. (declined. The sooner the statue is taken down the better).—N. W. (the question how to get rid of ants in a house has been answered several times in our pages, but apparently not very satisfactorily).—G. M. (we do not give addresses).—C. T. H. (we believe the Society in question one of the safest).—R. C.—G. C. R.—R. A. L.—P. P. P.—H. B.—Fairplay.—J. W. H.—J. D. S.—J. A. S.—H. S.—S. F. M.—W. E.—E. L. T.—F. H.—J. C.—S. C.—E. J. P.—H. B.—H. J. N.—Sir B. G.—E. P. R.—W. S.—H. D.—A. R.—J. P. H.—W. E. M.—U. & A.—B. & B.

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The Builder.

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German Exploration in Greece.

VALUABLE as have been the results of the German explorations at Olympia, they are cast into the shade by the discoveries made by the same industrious archæologists at Pergamos. And while the Berlin Museum is enriched only by casts of the Olympian marbles, it possesses, in the actual objects recovered at Pergamos, a treasure second only to the marbles of the Parthenon.

Buried in the sand, on the top of a hill covered with dwellings, the remains of the temple of Jupiter at Pergamos have been found in a high state of preservation. Some of the plaques have been discovered as perfect as if they had been wrought only yesterday. The indications recovered have been enough to justify a complete ideal restoration of the temple. Portions have been found of all the essential elements of the building; columns, capitals, cornices, entablatures, with indications of the exact dimensions of these main features, and of the position which they occupied in the building. Thus the idea has been happily carried out of making the museum for the exhibition of the Pergamos marbles a reproduction of the temple for which they were sculptured.

The plan of the Temple of Jupiter at Pergamos, according to the German explorers, differs from that of any ancient temple hitherto known. The architect has been the minister to the sculptor. Instead of having to display his figures in lofty pediments, at a distance from the eyes requiring some allowance for foreshortening, the sculptor has here produced a long internal frieze, which was brought under close observation by means of a sort of gallery, reached by a central staircase. This rose behind a central altar, situated in the centre of the uncovered area within the four walls of the edifice. The frieze is only interrupted by the staircase. Being only about 8 ft. above the foot of the spectator, it is thus admirably exposed to view. Small Ionic columns rest on the basement adorned by the frieze, and support the cornice. Metopes were also interposed, at a fair height, and well in view. These sculptures represent scenes in the legend of the Pelepidæ. They have unquestionable merit; but they attract but little attention when compared with the noble reliefs of the frieze. This dominant feature of the temple consists of blocks of marble of a bluish-grey colour, 2·30 mètres high, of unequal widths, and about 1½ mètre thick, held together by tenons. The blocks were inserted rough on the face, and sculptured in position in the temple.

The entire length of the frieze is about 100 mètres. The subject is the conflict between the gods and the giants. Jupiter, Minerva, Diana, Apollo, Amphitrite, and Cybele, are assaulted with the utmost fury by terrific forms, in the production of which the imagination of the sculptor has been subdued by exquisite taste. Thus the fins of the sea-horses conceal the line of junction between the body of the horse, and the scaly tail of the monster. It was one of these exquisite creations of fancy of which the beauty, when the specimen was sent to Berlin, was at once acknowledged to be so great as to decide the Government to provide funds for the continuance of the excavation. Among the giants there are great varieties of genus. Some have the human form; with faces full of youth and grace, they appear as terrestrial gods. Others are furnished with vast wings; the limbs of others terminate in the coiling tails of serpents. Others are yet more entirely composed of the elements of the lower animal life, with the neck and shoulders of the bull, or the mouth and claws of the lion. On these savage enemies Diana looses her enormous hounds. Rocks and stones are hurled by the combatants, and at the very end of the frieze an enormous serpent has just seized in his jaws the claws of the eagle of Jupiter.

The violence and force of the Titans contrasted powerfully with the calm and serenity of the gods. Severe in graceful beauty, they seem to disdain the utmost fury of their enemies. A female figure on horseback, probably Silene, who half turns to the spectator the upper part of her figure, is an example of exquisite grace. A yet bolder result of the imagination of the artist is displayed in the pause, and mutual regard, of a goddess of mature and perfect beauty, and a giant of human form as young and beautiful as herself. The ancient legend, of which we have no indistinct traces in the Pentateuch, has been represented on the frieze of Pergamos, with a force and beauty difficult to characterise in adequate language. Whether we consider the grace of the nude form, —the flowing outlines of the drapery,—or the contrast between the serener calm of the faces of the gods and the hatred, rage, fear, pain, and other passions so vividly expressed of the features of the Titans,—the whole composition presents the finest specimens yet discovered of Grecian art, with the sole exception of the marbles of the Parthenon.

As yet, it is much to be regretted, the names of the sculptors of these beautiful figures are unknown. But on two fragments the word ΕΠΟΙΗΣΕ has been found; and it is hoped that the names which must have preceded this word may yet be discovered. A most important result of these discoveries is the light that they throw on the special characteristics of the school of Pergamos. While presenting close analogies with the work of Phidias, the figures on the frieze of the temple of Pergamos offer also marked differences. They, moreover, recall the treatment of several well-known *chefs-d'œuvre* of ancient art; such as the figure of Victory with the Bull, on the balustrade of the Temple of Wingless Victory, at Athens, and the Victory of Samothrace, now in the Louvre. The head of a young girl in white marble, also found at Pergamos, and shown at Berlin, recalls the very type of the Venus of Milo.

Another group of ancient sculpture, generally referred to the school of Scopas, is recalled by the figures on the frieze of the Temple of Jupiter. Such are the dying warriors of Venice and of Naples, the gladiator of the Capitoline Museum, and the well-known group of the Laocoon. Of this last group, the central figure is an exact reproduction of a young giant stretched at the feet of Minerva, in the frieze. The attitude, the details of the torso, the thighs, and the coils of the serpent around, are absolutely identical. The only difference is in the right arm. But that in the Laocoon is a modern restoration, by Giovanni Montorsoli. In the figure in the frieze the arm is at once more expressive, and more in conformity to the general movement of the figure. It is bent back on itself, and brought close to the head, as if in a movement of agony. In another figure, that of a young man, who, in the anguish of death, grasps the arm of a goddess, we have one of the most touching inspirations of ancient art. The rank and wealth of what may, perhaps, best be called the Greek schools of Asia Minor, are brought into full relief by these wonderful sculptures. After the time of Alexander, relations were more close than before between Greece herself and her Asiatic daughters. The most famous sculptors of Greece, — Polycletus, Scopas, Praxiteles, — worked for the colonial cities. An uninterrupted succession of noble monuments bordered the coast. The tombs of Xanthus, at the point of Lycia; that of Mausolus, with its colossal statues, at Halicarnassus; the temples of Diana, at Ephesus; of Athene Paliades, at Priene; of Jupiter, at Pergamos; and many others, were sanctuaries of which the artistic wealth is attested by the voice of antiquity. Scopas was a native of Paros; Apollonius, of Rhodes; as were the painters, Apelles and Parrhasius; Agasias, the sculptor of "The Wrestler," was of Ephesus; and the name of Agesandros is inscribed on a pedestal found near the statue of the Venus of Milo.

A New Altar and Reredos which have just been erected in the Church of the Holy Cross, Liverpool, are stated to have few, if any, rivals in Great Britain. The group on the sinister side represents the finding of the Holy Cross by St. Helen, and the miracle by which the true cross was distinguished from those of the two thieves. This panel is 7 ft. in height and 9 ft. broad. On the dexter side, "The Descent from the Cross" forms the subject. The work was designed by Messrs. Pugin & Pugin, and has been carried out under their personal superintendence by Messrs. R. L. Boulton & Sons, sculptors, Cheltenham.

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THE GROSVENOR GALLERY.

Continuing the principle which was inaugurated recently, of rendering the winter exhibitions at the Grosvenor Gallery the opportunity for giving representative collections of the works of eminent modern artists, the conductors of the Gallery have this week opened to the public a collection of the works of two painters only,—Mr. Alma Tadema and the late Mr. Cecil Lawson. This tribute to the latter artist, which would hardly have been paid to him just yet as a living artist, comes very appropriately as a memorial to an undoubtedly gifted painter cut off prematurely at almost the outset of his career, to the great regret of many both among personal friends and among those who knew him only through his works; and the exhibition-room in which he made his first decided public success, by his large landscape, entitled "The Minister's Garden," is the most appropriate place in which to bring together the collected results of the labour of his short but energetic life.

Taking the works of the deceased painter first, it may be observed that while they show a surprising amount of important work on a large scale, considering the brief duration of their painter's career, it is somewhat difficult to arrive at a definite conclusion as to their precise value among modern landscape paintings, or as to the ideal, if any, which the artist had proposed to himself to follow. There are, in fact, two or three styles among this collection of landscapes, and these so much at variance with each other in regard to feeling and method, that it is difficult to understand how the same painter could have been thoroughly in earnest in all of them; and the conclusion must be that he was trying experiments, and had not fairly "come to his colours" in regard to landscape art. The "Minister's Garden" is a rather hardly painted landscape, with a much-elaborated foreground and a fine linear perspective of distance, but very deficient (as we believe we said when it was first exhibited) in aërial perspective. It belongs, on the whole, to the realistic school of landscape-painting. Shortly after this,—we are not sure if it was not in the same year,—came "In the Valleys,—a Pastoral," No. 172 in the present exhibition, in which there is a quite different method employed; even the foreground is under a misty veil of half light, and the distances are treated with much more attention to the aërial perspective of successive zones of distance, in a manner recalling some of the earlier work of Turner, of which some other paintings in the gallery (such as "Wharfdale," 143) also remind us. The painting called "The Morning after the Storm" (159), which is hardly like any effect of nature, appears to be an emulation, on the other hand, of the spirit of Turner's latest, and in a certain sense, most ideal work; while "The Cloud, Barden Moors" (163), suggests a double reminiscence, that of Crome in the composition, that of Constable in the manner of execution. This last is a fine powerful thing unquestionably, although we cannot but be conscious that the effect of sunlight on the masses of cloud is enhanced by the falsity of making the landscape itself, "the ground," in fact, a great deal darker and duller than it could be under an atmosphere which threw such a mass of light on the clouds; but if we put this alongside "The Morning after the Storm," it is impossible to think that the painter of these had any fixed idea about the object of landscape art or the method of interpreting nature. The collection impresses us as being, to a great extent, a series of reminiscences or more or less conscious imitations of the style and feeling of landscape-painters of former periods. This applies less, perhaps, to the largest work, "The Minister's Garden," than to any of the others; and among the smaller paintings there are a good many of much beauty and interest. But as a whole the collection impresses us with the idea that the late artist was a gifted but also a very ambitious painter, who was anxious rather too quickly to achieve a great style in landscape-painting, and in pursuit of this aim worked rather at random on hints from existing styles, instead of endeavouring to elaborate a style of his own based directly on the study of nature. For this reason we doubt whether his works can have that degree of permanent value which some seem to anticipate for them, although they represent a good deal of effective and powerful work, and we may very well believe that had the painter lived, he would in time have evolved out of the sum of these various efforts a distinct and original style of his own.

The collection in one room of most of the principal works of Mr. Tadema, while it brings out forcibly the splendid and constantly advancing technical power of his art, certainly at the same time illustrates its intellectual shortcomings. When we see only one of these beautifully-executed pieces of realism of antique life, we are delighted with the real picture presented to us of the facts and surroundings of that life, and the splendid execution of detail. But when we see a number of these works together, we cannot help feeling strongly their deficiency in higher human interest, or, we might almost say, in any human interest whatever. Of beauty, there is little in the figures, and where there is, it is beauty of mere material kind: hardly even the beauty of fine features, only that of surface and flesh tints. There must have been something more in ancient Roman life than mere *dolce far niente*,—mere bathing, drinking, and dancing; but Mr. Tadema's personages know no higher life than this; they seem to have no expression and character; they are outer masks of human life in which there is no informing spirit. The nearest approach to something like human interest and characteristic expression is in what in other respects we incline to regard as almost the artist's finest work, the "Sculpture Gallery." Here there is not only the artist's splendid power of painting details of sculpture and architecture shown to perfection, but there is also in the group of people collected in the gallery a degree of differentiation of personal character which makes us feel for once as if we really were behind the scenes of Roman society. The master of the house, quiet and dignified, the lady who sits by him and seems to look at the sculpture with a connoisseur's appreciation, and the other lady, who is chiefly thinking of her children, and how they are enjoying the show,—these stand out with a distinctness of character which we find in few other of the artist's figures. Mostly, they are so many figures clad in Roman costume, and that is all. The "Sculpture Gallery" also is a fine example of the beautifully clear light which Mr. Tadema throws over his scenes. One of his favourite effects, and one which is always charming, is that of displaying through a window opening or an archway some little bit of architecture in the middle distance sparkling under intense sunlight. This is beautifully seen in the two small paintings of nearly similar motive, "There he is" (65), and "A Love Missile" (96), in each of which a woman looks out from a window (in the latter case the figure seems to look through a metope opening, the sculptured slab of which has been turned on its centre); the interior is cool and grey, and through the opening is seen a bit of Classic building glowing in warm sunlight, and every detail showing through the clear atmosphere. This clear light strikes us again with special beauty in the scene called "Hide and Seek" (120), and in "En Repos" (73). The latter is an open-air scene, in which a figure sits on a terrace overlooking the sea, the high coast stretches away to the left, and one or two white temples glisten on the height in the distance. No painter has ever gone so far in realising this aspect of Classic architecture in the days when it was to be seen in its pristine freshness, and not, as now, merely beautiful in decay; his paintings beguile us for the moment into thinking that we have really been in the land of ancient columnar architecture when it was a living art, and that it is within reach for another visit.

The dates of all the pictures exhibited, or nearly all, are given in the catalogue; it seems a pity that they were not arranged in regular chronological succession an the walls; the less symmetrical arrangement which would have been necessary would have been more than compensated for by the advantage of being able to follow consecutively the history of the development of the special qualities which now distinguish Mr. Tadema's painting. There are one or two works painted as long as twenty years ago, which belong to a very different type of subject from that which we now associate with the painter's name, such as "A Bargain" (3), dated 1860. Here we see, however, that fondness for architectural detail and surface, which increasingly distinguishes Mr. Tadema's subsequent work, in the care which is bestowed on the treatment of the brick wall which forms the principal background to the figures. Of Mr. Tadema's treatment of Roman and, occasionally of Greek, architecture in his maturer style too much cannot be said; the study of his works is really one of the best of lessons in the characteristics of Roman architecture, and in correctness and effectiveness of representation of architectural detail he is beyond any other painter of the day. Among the architectural portion of his painting at the Grosvenor is an almost solitary example of a study of Gothic detail from Munster Cathedral (41), not treated, however, so forcibly or with such evident interest as is shown in the Classic architectural subjects.

Among the paintings, very few in number, in which the aim seems to have been to tell a story or raise an emotion beyond that produced by mere power of execution, the most remarkable is that of the Roman soldiers discovering Claudius, the last member of the household of Caligula whom they had left unslaughtered, and whom they dragged out, in a sudden turn of policy, to be made emperor whether he would or no. The peculiar situation, in which the man who has been hiding imagines the worst, and that he is at last discovered only to be dragged out and put to instant death, and is met at the same time by the half-grotesque adulation of the soldiers, is so admirably suited for illustration in painting that it would be surprising if so brilliant an executant as Mr. Tadema should not have made an effective picture even by the most realistic treatment; and this picture is really effective and at the same time natural. The grouping arises out of the probabilities of the situation. The majority of the soldier's party remain at the conventional distance in an attitude of homage to the man they have just at that moment concluded to call emperor, but it is necessary that he should be apprised of the fact, and one soldier of the party therefore goes up and drags aside the curtain which conceals him, and we have the almost grotesque contrast of this soldier bending the knees and bowing before a frightened wretch who is nearly beside himself with apprehension. That is the intention of the picture, though the expression on the countenance of Claudius does not quite explain itself; in this and other respects the smaller and more roughly executed edition of the picture (92) which seems to have been the first study for it, has more life, truth, and animation than the finished picture. But it is much to be wished that Mr. Tadema had turned his attention more often to illustrating definite scenes, historic or imaginary, and well-marked characters and actions, instead of confining himself so much to the mere portrayal of figures of Roman physique and costume, but with no story to *interest us* and no definite or marked character *to distinguish* one from another. Had he made more attempts of this kind, the interest of the present collection would have been greater even than it is. "The Widow," and "The Death of the First-born" (37, 49) come nearest to human interest of the same kind; but even in them we feel that, though the subjects are ostensibly of a very pathetic nature, the painter has been thinking mainly of his Egyptian architectural details and *bric-à-brac*, and the feeling of the situation is very secondary with him. Perhaps the best subject-picture next to Claudius is the "Fredegonda" (98), which hangs at the top of the room, and which, like the Claudius, many will remember in the Royal Academy exhibition. There is here really some pathos in the figure of the deserted queen watching the nuptials of her rival, from which the elaborate detail is not able entirely to distract us. In other cases titles are given to pictures which imply a subject, such as "A hearty Welcome" (82), in which a girl is embraced by the mistress of the garden; but the incident is completely secondary, the picture consists in the brightly-painted garden-scene with its half red and half white columns among the maze of plants, and the sunlight which sparkles over the whole. This, of course, is in itself an object quite worth painting, if Mr. Tadema were to be regarded as a painter of architecture and landscape merely; what we regret is that an artist with such power of drawing and painting the figure should put this power to so little use in regard to the portrayal of human sentiment and action.

In regard to the artist's figure-painting *par excellence*, there seems to be a constant advance in power in this class of work up to almost the present moment. If we take the

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three principal nude subjects in the collection, which belong all to a recent period, we cannot but see this. "After the Dance" (105), in which a young Bacchante has thrown herself down in (it is to be feared) a tipsy slumber, is dated 1875, and attracted much attention in the Academy at the time. This is a remarkable and charming work, and could not be surpassed in drawing; but if we go from this to the "Sculptor's Model," painted two years later, there is a nearer approach to the real texture of the living body in this, and some portions of this figure, notably the feet, are among the most beautiful bits of painting that have ever been seen in ancient or modern work. The small picture called "The Tepidarium" (118), painted last year, is hardly to be compared with "The Sculptor's Model," as the latter is full size, and "The Tepidarium" is a figure which would only stand about 1 ft. high; but in this little work, which represents a young woman reclining in the luxurious languor induced by the warm bath and the warm chamber, the delineation of the body, both in form and colour, seems quite perfect; we can almost see her movement in breathing. We again feel it a pity that such beautiful work and such power over technique should not be employed as a means to higher aims, rather than merely as an end in themselves; but the beauty of the work is undeniable. The whole collection impresses one with a sense of having been studying paintings in which the power of representing what the painter wishes to represent is more completely within his call than, perhaps, is the case of any other artist of the day; but one is obliged to set off against this the admission that the aim is not on the whole a very high one; at all events, not the highest, and that it is possible to tire of even the most brilliant execution when it is accompanied by no attempt at emotional expression, and makes no appeal to the intellect, in the higher sense at least. What these pictures really have, beyond their remarkable execution, is the interest arising from the archæological knowledge displayed in them, and the feeling they give us that we have really seen something, through them, of at least the external aspects of a society long since passed away; to which may be added the admirable delineation and revivifying of Classic architecture, which we especially should be ungrateful to forget to recognise.

OF PORTRAITS AND INSCRIPTIONS APPERTAINING.

THE establishment, and still more the apparent, though it may be only the quietly-growing, popularity of the National Portrait Gallery, bear present witness to the interest which has so many other attestations, attaching to the recognition of the features of distinguished men and women, even the merely notorious as well as the admirable; curiosity will take no denial, however authoritatively assured that its satisfaction will be but futile. "There is no art," says Duncan, "to tell the mind's construction from the face"; such is his conclusion from the betrayal of his absolute confidence by the Thane of Cawdor, and his words are scarcely pronounced when they are practically illustrated, as he embraces the still more deadly traitor, Macbeth, the late warning notwithstanding, with confidence no less absolute, as his "worthiest cousin." The difficulty, indeed, is further enhanced when we have to make allowance in our interpretation of character from what at best may be a mask, for an entirely foreign intrusion of characteristics due to the style and the limitations of a sculptor or a painter. So far as a painter,—a Lely or a Vandyck,—may be in harmony with the prevalent tone of the society which furnishes his subjects for portraiture, this difficulty is minimised. But even in such cases, it is by no means unimportant; to reduce it to insignificance as nearly as may be, it is necessary to make ourselves at home among the subjects, and very familiar indeed with numerous works of a particular painter; then his own speciality will come by degrees to be insensibly allowed for as a common difference, and will cease to overlay so oppressively the variable distinctions of his several models. We may then recognise even the bold broad lines of the nature of Oliver Cromwell, despite the dressy finishing and furbishing of a mannerist. The sophistication, therefore, of the mannerisms of the artist have to be discharged and got rid of, like the equally-confusing sophistications of the fashions of a period. The extravagances of fashion,—of obsolete fashion,—at first render all portraits uniform; and there is really some excuse for interchanging one bewigged celebrity for another, be their personalities as contrasted as Addison and Walpole. The confusion vanishes upon familiarity, even as we learn, with prolonged intercourse, to get over our mistakes between twins, and wonder at last how any mistake was ever possible. Plato surely must have seen little of Egyptian statues, or paid little attention to them, or he never could have written down that they all conformed mechanically to a fixed hieratic model. A still more serious, if it does not prove too often a fatal difficulty in the way of obtaining a true impression of the original of a portrait, is due to utter incompetence of a painter. We may discount Vandyck; but as "true no-meaning puzzles more than wit," and the flourishes of a caligraphist are tolerable as compared with torn copy, there is little indeed to be done with professed portraiture that finds it easier to leave out expressive forms or to substitute nonentity, than to err by exaggeration, which at least owes a departure to the original. The engraved portrait of Shakspeare prefixed to the first folio, is but a sorry production; and if, indeed, as Ben Jonson's verses assure us,—therein "the painter had a strife with Nature to outdo the life,"—the painter had very much the worst of it, as has happened before and since. And yet when it is carefully collated with the Stratford bust, and further assisted by familiarity with a certain type of face and general build very prevalent in Warwickshire, we may be satisfied with our recovery of the genial presence of the "handsome well-shaped man," and flatter ourselves, if we please, that we can recognise in it the infallible expression of one who, by the testimony of surly Jonson himself, "was indeed honest, and of a free and open disposition." But what shall we say of the "Chandos portrait," which is installed in the place of honour at the National Portrait Gallery? Those who claim to be experts accept it,—"give it title, knee, and approbation." They even are ready to attest that its genealogy from one possessor to another is irreproachable, and albeit there are cavillers who shake the head at the ring of some links of the chain of pedigree under tap of the critical hammer, it seems that authority will not be gainsaid. But what, then, is to be said for the painter? His production is absolutely at variance with every characteristic both of form and expression, in which the bust and the engraving confirm each other, while harmonising with the authentic accounts of the nature of the man. We must be content to take warning how little faith is challengeable for the resemblance of a single portrait, at any rate, of the sixteenth century, when it is put before us, without the confirmation of a certain degree of correspondence with other representations of the original.

How many uncertainties of identification would have been, and would be saved, were the custom but universal of attaching a name to the canvas or the marble, out of sight, at least, if we are to admit and make allowance for a certain inscrutable repugnance to a frank exhibition of it. Some such aversion there certainly seems to be, and to have been as prevalent in ancient as in modern times. It is with a sense of irritation and injury that we regard the numerous fine but unidentified portrait busts that have come down to us uninjured from antiquity. It is scarcely less tantalising than to come, as we do, upon fragments of busts inscribed with historic names, but wanting the heads. A chorus of congratulation and delight has recently greeted the identification of a beautiful uninscribed bust of Thucydides at Holkham,—perfectly certified, thanks to a bad but inscribed repetition at Naples; another has been pretty generally accepted, but, at best, it is only with trembling hope, as that of Æschylus. All over the kingdom, ancient homes contain portraits which declare themselves as ancestral by re-appearances of features in current generations, but otherwise are so far unknown as to be nameless, even by family tradition. They are shades upon the very banks of Lethe and destined sooner or later to lose their last hold upon authentic memory, and absolute forgetfulness is one day to take possession of them as they pass to Wardour-street. After this preliminary transmigration they may ultimately find themselves perchance enjoying an illusory revival, adopted for representatives of the remote ancestry of wealth which is of too sudden and recent an origin to have authentic record, even of a grandfather; so it is that the satirist is consoled for the seeming encroachment on ideal life of a spirit of dull matter of fact:—

> "No! for the age I've no alarms,
> Still bright shall glow Romance's fires,
> Whilst Herald's College finds our arms,
> And Wardour-street our pictured sires."

Friends and relatives who are interested in a portrait at the time of its production do not require a certificate of identity, and to inscribe a name upon it would naturally seem incongruous and even offensive as implying a possible failure of memory that could only be ever at fault from the dying out of affection or respect. When the interval between the ages of successive generations happens to be considerable, and especially when the transition is made further discontinuous by premature deaths or by habitual taciturnity of the elder branches, as to family matters, tradition may finally and irrevocably expire within twenty years. Let those who have had their curiosity aroused as to their predecessors declare how they have had to lament not taking timely evidence of the last survivor of a social connexion which retained vivid existence in one single vivacious memory, and with the extinction of that memory died out, instantly, entirely, irrevocably. The fly-leaves of the family Bible have ever but insufficiently supplemented that parochial record,—

> "Where to be born and die
> Of rich and poor makes all the history."

The suggestion is not trivial that every family should have its book of domestic record: a primary purpose might be to verify the mere sanitary history of childhood and youth, from vaccination onward, but among other notes,—usually doubtless the briefer the better,—places might with advantage be found for securing the dates and identities of portraiture. Thus much for the satisfaction of purely domestic interest and permanence of family tradition; but even so it would be well for the attachment of permanent inscriptions to portraits to be the rule; for the portraits are many which have a public as well as a private interest, and are liable to go astray from their best associations through the accidents of dissolution or dispersion of families.

Portraits, once safe in public institutions, are pretty generally inscribed, as, for instance, the interesting series in the rooms of the Royal Society at Burlington House, or the Architects' Institute, and that which commences with Count Rumford in the ante-room of the lecture-theatre in Albemarle-street. The only suggestion to be insisted on as desirable is that the dates of birth and death should, in every instance, be added. This is an addition which should be as absolutely the rule in the case of memorials in public places,—of statues of worthies, whatever the nature of their claims to such distinction. Certainly a public statue should never be erected in honour of one whose simple name alone does not carry the justification of the honour, like Cobden or Havelock, Peel or Peabody, Jenner or Rowland Hill. Properly funereal monuments, either in cemeteries, cathedrals, or abbeys, have a traditional claim to more diffusive inscriptions. Antiquity has bequeathed us many touching epitaphs, even on the personally insignificant. Many will recall the tender lines of Martial for the tomb of "little sweet Erotion," so beautifully rendered in English by Leigh Hunt. Here is a literal translation of a Greek epitaph dug up no long time since on the Isthmus of Corinth:—

> "The bonds escaped that nature held me in,
> Back to my source come I, Philostrata;
> For after four years upon ten completed
> I left the body in the fifth,—a maid
> Childless, unwed, unwoo'd: who finds a charm
> In life—may live to old age for me,—and welcome."

As regards personages more dignified we have the terse epitaph of the Scipio,—intermediately such an example as the grand four lines on the tomb of Gonzalo of Cordova, in St. Geronimo at Granada; and in our own country and later times we would not willingly be without such epitaphs as those on Christopher Wren, Goldsmith, and Howard the philanthropist, or lack even one more such an irreproachable model of a commemorative inscription as Professor Jebb provided for the pedestal of Macaulay in the ante-chapel of his college.

Any epitaph, or inscription either, to be justified must be concise, elegant, characteristic,

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and true; when Prior, in his playful verses, "For my own Monument," gave notice that,—

"Mat, alive and in health, of his tombstone took care,"

he gave warning at the same time,—

"Then, take Mat's word for it, the sculptor is paid.
That the figure is fine pray believe your own eye;
Yet credit but lightly what more may be said,
For we flatter ourselves and teach marble to lie."

Certainly his actual epitaph in the Abbey, whether entirely truthful or not, is much too diffuse. Still, it should not have provoked Dean Stanley to stigmatise his poetry as "poor," for Mat was master of his craft in a certain original style, and even in more than what Cowper affectionately calls "Dear Mat Prior's easy jingle," as surely as Swinburne is at present.

It is not so bad a fault for an inscription to be obscure and equivocal as to be false, and yet a fault it is to leave us hovering in choice between no meaning at all or too many. Such ambiguity especially besets an endeavour to be pointed as well as concise. An unlucky example of it is very frequently before us. As we enter the National Gallery we read below the bust of David Wilkie and the dates of his career, the line,—

"A life too short for friendship, not for fame."

The intended meaning is doubtless that Wilkie's life was shorter than his friends would have wished it, but long enough to enable him to attain to high celebrity; yet this meaning has to struggle through such contesting suggestions as that Wilkie had no time to make attached friends while he was making himself famous,—or even that though his friends would have wished him with them longer, it was high time for him to die for the sake of his reputation. For eulogy to be perfectly graceful it must not only be manifestly sincere, but it must be exempt from any cloudiness that invites the cynical to misinterpretation of its terms, and it must be free, moreover, from obvious liability to awaken collateral incongruous associations. Lord Palmerston, if we may trust the Annual Register for 1861, did not wind up what is declared to be an eloquent eulogium of Count Cavour, without making more than one of these mistakes. "It might well be said of him,—so runs the closing sentence of the speech, that he had lived a life,—

'To point a moral and adorn a tale,'—

and though his death was premature, it could not be said that he died too soon for his glory and his fame."

In the last clause we have a repetition of the awkwardness of the monostich on Wilkie; its terms do not exclude the suggestion that in the interest of his fame it might have been as well for Cavour had he died a little sooner. This, doubtless, would be to wilfully misunderstand the orator; but eulogistic oratory, like Cæsar's wife,—though Cæsar himself had little right to stand on his dignity in the matter,—ought to be incapable of being misunderstood. The quotation is even more unlucky. A majority of Lord Palmerston's hearers would be certain to refer the line to its origin, Johnson's example of the vanity of human wishes in the close of headstrong ambition in humiliating failure of such a contrast to Cavour as Charles XII. of Sweden,—a celebrity only pointed at with scorn as having

"Left a name at which the world grew pale,
To point a moral or adorn a tale."

But our concern is not with Parliamentary, but with monumental recognition of the great, the distinguished, the interesting, more especially in the form of portraiture, with identifying titles and appropriate inscriptions, and though much more might be said upon this theme, at present let this be enough.

Christmas and New Year Cards.—S. Hildesheimer & Co. offered 2,000*l.* as prizes for the best designs last year, and afterwards spent 2,500*l.* more on other than prize designs. They have sent us a sample box of the results, and we are bound to say that they are excellent of their kind. As specimens of printing they are not surpassed. Their execution is attributed to M. Hagelberg, of Berlin. We praise them as of their kind, and we hope the retail dealers will look to them before they make their selections; nevertheless, we cannot help thinking, considering the enormous sums of money annually spent on such cards, that something more artistic, though possibly less attractive to the multitude, might be produced.

THE DECORATION OF ST. PAUL'S CATHEDRAL.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary fortnightly meeting of this Institute, held on Monday evening last, Mr. Horace Jones, President, in the chair, among the members attending for the first time since their election were the President (Mr. Stevens, and Messrs. Murgatroyd and Holden, members, of the Manchester Society of Architects, who had come to London to confer with the Council on matters affecting the interests of provincial members of the Institute. The President assured them that the matters in question should have the serious and careful consideration of the Council.

The Secretary announced that Messrs. E. P. Warren and Percy Hunter had passed the Obligatory Examination held in November, and the Council had awarded the Ashpitel Prize to the candidate who had passed best in the three examinations held this year, viz., Mr. Thomas Purves Marwick, of Spottiswoode-street, Edinburgh. The silver medal offered by Mr. Ernest Turner for proficiency in sanitary science subjects shown by the candidates in the Architectural Examinations had been awarded to Mr. Charles Steward Smith, of Reading.

The Chairman said that it had been his pleasing duty and his high privilege to attend as the representative of the Institute at the opening of the Royal Courts of Justice that day, but in common with all the members of the Institute he could not but regret that he who had called forth the masses of stone, timber, metal, and other materials of which the vast building was composed, and had by his genius given them form and shape, was not present to see the completion of his work and to receive the reward which would have been his due.

Mr. Hebb wished, before the paper of the evening was read, to call the attention of the Council to the fact that the present Government had arranged for the re-opening of the inquiry into the circumstances attending the death of Mr. C. Chaloner Ogle, a young architect, and a member of the Institute, who was believed to have been murdered at Volo, in Thessaly, in the Spring of 1874. A previous inquiry had been held and closed without any satisfactory result being arrived at; but now that Thessaly had been ceded to Greece, the present Government had taken up the matter anew, and had commissioned Mr. Fawcett, her Majesty's Consul at Constantinople, to proceed to Volo to make further inquiry into the subject. He suggested that the Council should take into consideration the desirability of thanking the Government for the steps they had ordered to be taken with the view of vindicating Mr. Ogle's memory and of obtaining the punishment of those who had caused his death if it should be shown that his death had been caused in any felonious manner.

The Chairman said that the matter should receive the attention of the Council.

Mr. R. Popplewell Pullan then read a paper on "The Decoration of St. Paul's Cathedral." He said he hoped that his paper would be of interest to some of the members of the Institute, would excite few of them, irritate none, and be instructive to all. No question of the present day had roused so much party spirit as this question of the decoration of St. Paul's. For the past twelve years the cathedral had been the arena of a succession of fights, of the warfare of parties, and of the "Battle of the Styles." It was to be regretted that this had been so; for it was worse than puerile to bring party spirit to bear upon the solution of a problem on which depended our reputation for good taste, not only now, but in the future. The topic was a most absorbing one, and it behoved them all to watch very carefully everything that was done in the matter, lest some wrong and irremediable step should be taken. The matter was now in the hands of a sub-committee appointed by the general committee to act as an executive committee. The proceedings of the sub-committee were to be subject to the approval of the general committee, and afterwards to that of the Dean and Chapter, and when that approval had been given, the proposals were to be made public before anything decisive was done. It was thus very necessary that the public should be informed from time to time of the progress that was being made, so that when they were called upon to come to a decision they might be able to form a just judgment. But the questions arose, Who amongst the public were qualified to decide on such a matter? Who were the men who were most likely to be competent to form a correct opinion? What was duly-qualified public opinion? The only body of men who were qualified to come to a right decision were the members of the Royal Institute of British Architects, men who were accustomed to decorative designs in connexion with architecture, and who had, by study and observation of the best works in all countries, made themselves acquainted with the possibilities and limits of decoration. It was at one time hoped that the whole matter should be officially referred to the Royal Institute of British Architects, or the Royal Academy, which would have perhaps been very much the same thing, as the Academy would have referred it to its architect-members. The matter was now, however, in the hands of a sub-committee of representative men, and from that sub-committee he (Mr. Pullan) had received every courtesy when he submitted to them what was now regarded as a rival scheme, although at the time it was offered it was merely intended as a suggestion towards the solution of the problem. Soon after the report of the General Committee was presented, three years ago, he submitted to the sub-committee a scheme which was the joint production of himself and the late Mr. Heath Wilson, of Florence. Having reviewed the history of the movement for the decoration of the cathedral, Mr. Pullan described the iconographic scheme which was prepared by Mr. Burges, upon which unmerited obloquy was poured, one of the accusations made against it being that it was "Mediæval." Mr. Penrose exhibited a rival design. Some of the contributors threatened to withdraw their subscriptions unless Sir Christopher's intentions,—though nobody knew what these were,—were carried out. The minority of the committee vigorously protested, in June, 1874, against the majority's decision. All these influences told against the cathedral architect, and in November of the same year the Dean and Chapter resolved to rescind the agreements made with Mr. Penrose and Mr. Burges. In Mr. Pullan's judgment, there were many good points in the designs of both, and but for the violence of party spirit the work might have gone on. After the rejection of these designs there was a truce until 1876, when Mr. Oldfield published his very able letter to the Dean, in which he revived the whole subject. Of this pamphlet, and of its bearings on the problem of the decoration of St. Paul's, Mr. Pullan gave some account. He was, however, greatly scandalised by Mr. Oldfield's last recommendation to his colleagues on the sub-committee, which they had *adopted*. By it they were urged to dispense *with an architect*, and so to save money, whilst at the same time eliminating a frequent cause of division amongst their subscribers. Having repudiated architects, continued Mr. Pullan, they sought for a design from other sources, and at last unearthed a model on which Stevens, a sculptor lately deceased, had left some rough indications of his notion about the decoration of the dome of St. Paul's. The discovery of this model at that critical juncture was most opportune for them. It was a tower of defence for them against their foes. And they further strengthened their position by forming an alliance with the two greatest English painters of our day, Sir Frederick Leighton and Mr. Poynter. With both of these eminent men they made a formal agreement, stipulating that Stevens's design should be taken as a basis; that a full-sized coloured cartoon should be placed *in situ*, one portion of which was to follow literally or with some modification Stevens's design, the other portion being of a more conventional or architectural form; but in any case Stevens's arrangement was to be worked out and the frame to be filled with pictures, the subjects of which were to be taken from those suggested by Mr. Oldfield in a second letter to the Dean,—namely, scenes from the Apocalypse. The Dean and Chapter sanctioned the experiment, reserving to themselves full power of discussing the matter and also of rejecting the cartoons if they should be unsatisfactory. Now what, asked Mr. Pullan, was Stevens's model? A half dome on which were sketched roughly Titans, Telamones, angels, and squatting figures arranged to form something like ribs, with circular medallions on a plain gold ground to receive the cartoons. The design was without any architectural character, the dream of a man who had Michelangelo on the brain, and

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who was thought a man of the greatest genius, because he had executed a monument, full of fine details, to be placed in a position where they could never be properly seen. This was the Wellington Monument, a canopied tomb adorned with groups of figures so placed that little beyond the soles of their feet could be visible to the spectator. This tomb was to have been crowned with an equestrian statue of the great captain whom it commemorated, placed in such a lofty position that his nodding plumes would almost have swept the ceiling of the Consistory Court. This figure, however, the artist was compelled by public opinion to omit. The result was the leaving out of the crown of the design, which was thus made to finish in a plain table-top. Neither in the Wellington monument nor in the model for the dome did we recognise that perception of the fitness of things which was wont to characterise the man of the highest genius. Sir F. Leighton and Mr. Poynter, Mr. Pullan contended, ought never to have been pledged to adapt their pictures to Stevens's crude framework, which, with whatever proposed modifications, would always remain unworthy of the productions of their pencils. Mr. Pullan spoke next in detail of the design jointly prepared by himself and his friend the late Mr. Heath Wilson. The fundamental principles which guided the two friends in the production of their design* were then expounded. According to Mr. Heath Wilson, the Court of Heaven, as described in that grand triumphal hymn, the "Te Deum," commended itself to the judgment of the two friends, as offering subjects individually graphic, appropriate, and impressive, and which, when united, might be brought effectually within the strict conditions of decorative art. They aimed at an embodiment of prayer, praise, and thanksgiving as expressed in the "Te Deum." They prepared a drawing,—one-sixth of the full size,—of an eighth part of the dome, proposing to divide the entire circle into eight equal parts by means of ribs, richly decorated and of large proportions. These would spring from eight thrones, each filled by a seated prophet, a figure which, if erect, would be 18 ft. in height. These would form noble themes for a great artist's powers of design, admitting of exalted idealism and thoughtful action, combined with religious sentiment and fervour. The spaces between the ribs were occupied in the lower portions of the curve of the dome with an architectural composition in two zones, consisting of a podium or basement, with a corridor above, intended to recall in a measure the general design of Sir James Thornhill, which may have been approved by Sir Christopher Wren. This structure, with a baldacchino in each central space, was meant as a background to the figures thronging this portion of the cupola. An Apostle was enthroned under each baldacchino. The martyrs were grouped on each side and in front of the basement. The architectural forms, the ascending aërial perspective of which had been graduated with much care, were relieved against the pure azure of the whole upper curvature of the dome, on which depended, in considerable measure, the beauty of this part of the design. As the azure ascended it grew paler, till it melted into pure white. On the surface of this azure were ranged angels, excelling in brightness as they rose rank above rank.

The Chairman, in inviting discussion, said the meeting was thankful to Mr. Pullan for having put forward his views on this important question, the consideration of which was one demanding great care. It was to be hoped that all the discussion and consideration which had been given to the subject would eventuate in the happy and satisfactory execution of the work. He should be glad to hear the views of Mr. Penrose on the matter.

Mr. Penrose, Surveyor to the Dean and Chapter of St. Paul's, said he was only in a position to say a word or two on the question. If Mr. Pullan invited the members of the Institute to an academic discussion as to the best style of decorative treatment for a large domical church, he should consider the subject as being very useful for the consideration and guidance of those who had charge of the cathedral, and of the decoration committee. If, however, Mr. Pullan invited discussion on the merits of a scheme put forth in rivalry with the scheme which was being prepared under the guidance of the committee, such discussion would be decidedly premature, for the Institute had not before it the materials for enabling them to form an opinion on the subject. Only a part of the proposal which was under the consideration of the sub-committee had been seen at all. There was more to come from Stevens's designs than had yet been shown. There were, he thought, ample safeguards against anything being done in haste. The sub-committee who were charged with the preparation of a design in conjunction with the painters would have to get the approval of the general committee, and if the general committee passed the design its adoption was still subject to review by the Dean and Chapter. He did not think that Mr. Pullan had been just to the memory of Stevens, either as to the Wellington Monument or his design for the decoration of the dome. For the reasons he (Mr. Penrose) had given, he asked the Institute not to commit itself to any opinion on the subject at present.

Mr. Stannus observed that Mr. Pullan had shown by his paper that he was not fully cognisant of the state of affairs in connexion with the matter under consideration. He (the speaker) would briefly narrate his own part in the matter. He had been a pupil of Stevens, and had been elected an Associate of the Institute, when he was commissioned by the sub-committee "to prepare, in conjunction with Mr. Poynter, and subject to the approval of the committee, a full-sized cartoon." On receipt of this commission he went to France and Italy, where he spent the months of October, November, and December of 1878 in making studies of all the good dome treatments he could find, in order to the more fully fit himself for his work. When in Rome, towards the end of his journey, he made a modification of Stevens's design, which he brought back and worked out on the scale model. That design was submitted to the sub-committee forthwith, but, as Mr. Poynter was not then prepared with his version of Stevens's design, it (Mr. Stannus's design) was kept in abeyance in deference to Mr. Poynter until this year, when Mr. Stannus was commissioned to prepare an experimental full-sized cartoon, to be fixed in the cupola simultaneously with the other. Thus there would be two designs,—first, the modification by Mr. Poynter (*not* by Sir F. Leighton), which he (the speaker) ventured to call a painter's interpretation of Stevens; and secondly, the modification by himself, which was an architect's interpretation of the same thing. He regretted to have to give these details, and to mention his own name so much, for it would be well if all names could be forgotten, and the work judged impersonally. His own modification was really only the combination of the most characteristic portions of Stevens's design and of the rib treatment suggested in a design by Mr. Penrose some years ago. He (the speaker) plagiarised that design unconsciously, but the credit of the idea was none the less due to Mr. Penrose. Mr. Pullan had found fault with the sub-committee for having, as he said, "repudiated architects," and for having in their report "altogether ignored" the architectural profession. He (the speaker) did not speak of himself as being of much account; but surely Mr. Penrose was an architect, even according to Mr. Pullan's ideas. And what were the words of the committee? They said,—

"Although the adoption of Mr. Stevens's design as a basis for their operations will enable the committee to dispense with the services of an architect for the purpose of furnishing designs, it is evident they will require the assistance of some properly-qualified person," to help them with contracts, supervision, dimensions, &c.; and they, "being of opinion that Mr. Penrose possesses all the qualities requisite for such a post, recommend his being employed to perform those duties, and generally to assist and advise them in carrying out the decoration of the dome."

That extract would suffice to show that Mr. Pullan's inference was unjust to the sub-committee. Further, Mr. Pullan had not been quite fair to Stevens. He praised Sir Frederick Leighton and Mr. Poynter,—and everybody wished that they might both be long spared to enrich English art with the noble creations of their pencils; but Stevens was dead, and not here to explain his intentions or defend their results. Mr. Pullan had spoken of Stevens as "a sculptor lately deceased," as if to imply that, being a sculptor, Stevens was not fitted to decorate St. Paul's. Mr. Pullan surely ought to have known that Stevens was pre-eminently an artist,—neither sculptor solely, nor solely painter, architect, or ornamentist, but possessing that balanced mastery over all which made an artist. He was, of all Englishmen, living or dead, just the man fitted to design this work, and Mr. Pullan's want of knowledge of this greatest of English decorative artists, whether his fault or his misfortune, was fatal to his pretensions to criticise the actions of the sub-committee in working upon the design. Of Mr. Pullan's opinions about the Wellington Monument, he (the speaker) would only say that in another fifty years, when those who were there assembled had all been duly assessed and shaken down to their proper places, there would be no need to brush away any cobwebs from Stevens's name. But on Mr. Pullan's statement, given as a fact, that "the nodding plumes" of the surmounting equestrian statue "would almost have swept the ceiling," he (Mr. Stannus) might say that the full-sized figure of the Duke as modelled by Stevens (and which was in the speaker's possession) had no plumes in the hat, which was to be in the hand of the figure. And he might further state that when commissioned by Her Majesty's Office of Works to superintend the completion of the monument, he measured the vertical distance from the present summit of the monument (which Mr. Pullan had termed "a table") to the ceiling, and found it to be 18 ft. Mr. E. J. Poynter, whom Mr. Pullan characterised as one of the greatest English painters of our day, said, in a letter to the *St. James's Gazette*, in July last,—"I have never kept out of sight either the design, or my immense admiration for it and for the magnificent genius who produced it." But Mr. Pullan had spoken of "rough indication" of Stevens's "notion," and said his "crude framework" would always be "unworthy of the productions of the pencils" of Sir F. Leighton and Mr. Poynter. The quotation just made, and the manner in which these two eminent artists were content to work out Stevens's design, showed what *they* thought. Mr. Pullan had spoken of the sub-committee "further strengthening their position" by forming "an alliance" with Sir F. Leighton and Mr. Poynter. To any one who knew the chivalrous sense of honour of Sir F. Leighton and also of Mr. Poynter, and who knew the sub-committee, it was astounding that such an imputation should be made. The sums these "two greatest English painters of our day" were to receive, though great, were yet much below what they would receive for similar work done for private clients. It would have been only decorous on Mr. Pullan's part to have exhibited Stevens's design, or at least a sketch of it; but he had asked the Institute to confirm his judgment,—an *ex parte* statement. On the charge that Stevens's design was one without architectural character, it might be suggested that one unfailing test of the architectural fitness of any superadded work (and decoration is, *ab origine*, a superadded work) was, Did it fit on to what already existed? Let them examine Stevens's design to see. There is a peristyle below the cupola consisting of thirty-two pilasters, spaced equally, with voids at the axial points. There are windows between the pilasters arranged in eight groups of threes, the groups being axial with the eight arches of the dome, and between these eight groups of windows the other inter-pilastral spaces are occupied with niches. Let it be observed how Stevens arranged an attic balustrade proportioned to the supporting order, how the balustrade was broken over the pilasters, and how by that expedient he tied the design together and fitted the superadded to the existing work. This, which was one of the features, and was a distinctly new treatment, would suffice to show whether Stevens's design had architectural character. Again, the adaptation of the circular frames, which Mr. Pullan improperly termed "medallions," was also a distinct invention of Stevens's. It was well known that every section of a sphere was a circle, and that simple fact had been taken advantage of by Stevens in his design. The large circular panels were the most characteristic feature of Stevens's design. They gave opportunity for storiated panels without lines which sag in the centre, as all rectilinear panels on a concave surface must. It had been objected that they would form ellipses, owing to the perspective, but this distortion through foreshortening happened to all visible objects, and the eye was accustomed

* Mr. Pullan exhibited a large painting of this design by the late Mr. Heath Wilson and himself.

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to and allowed for it. Another advantage of the arrangement of circles was that they made a pattern, as it were, all over the dome, and gave a marvellous unity which did not exist in any other treatment with which he was acquainted. That quality of "all-overiness," if he might be allowed to use the term, was, in fact, only another proof of Stevens's subtle feeling that the cupola was a roof which covered, and not a ribbed transparency to be looked through. A further feature in Stevens's design is the arrangement of the thrones; these are combined with the balustrades, so that the capping of the pedestal forms the seat, while the back of the throne is inclosed by pilasters and a circular pediment; and the whole forms a striking central feature over each of the eight arches. Stevens might have mixed up his thrones and his ribs, and produced a confused effect in the ribs and a bald effect in the space between; but he had more architectural feeling, and he had evidently considered the view as seen by a spectator on the floor of the cathedral. Any one entering St. Paul's by the western door sees first of all the vaulting of the nave and chancel, and a portion of the podium of the "whispering-gallery"; when under the western dome he can see as high up as the middle of the windows in peristyle. He must advance one bay before the commencement of the cupola is visible, and it is only when he has arrived at the arm of the cross that he can see the entire height of the cupola. Now, this gradual unfolding or *apo-kalupsis* of the cupola was certainly one of the data of the problem, and any design must not only fill the mind when the culmination of the whole is seen, but should satisfy the eye at each successive stage. Testing Stevens's design by that canon, the decorative value of the fine group of the axial throne, with the superincumbent circle, would be recognised even before the whole cupola was visible. The placing of all the features on a ground of gold, which permeated everything, was, considering the normal gloom of the dome, not the least of Stevens's valuable ideas. Those who had seen the interior of St. Mark's at Venice would be convinced on that point. Mr. Pullan had criticised the ribs in which the telamons occur. He (Mr. Stannus) was not concerned to defend them; he fully admitted that the whole design was merely a sketch,—that the world lost Stevens before he had completed the working out of his idea; he had probably intended some modification. The ribs, however, were not the finest nor even a necessary or characteristic part of Stevens's design. The manner in which he had fitted his design to the existing architecture, the arrangement and proportion of the circles, the eight axial thrones, and the gold ground permeating all, were to be regarded as the essential features of his legacy towards the solution of the problem. These all showed subtle architectural feeling on Stevens's part. It should be borne in mind that there were such things as designs with architecture introduced, as well as designs with architectural feeling, and that the former did not necessarily imply the latter. There might be, for instance, a design in which sham shelves, brackets, walls, colonnades, and ribs were shown in incongruous style; but of such an imaginary build-up it might be considered that less architecture and more architectural feeling would be desirable. With regard to the scheme of storiation prepared by Mr. Edmund Oldfield, M.A., one of the sub-committee, it was not his (the speaker's) function to defend it, but he would remind the Institute that scenes from the Apocalypse were suggested for the dome in Mr. Burges's iconographic scheme of 1871. In conclusion, Mr. Stannus said he quite agreed with Mr. Pullan as to the importance of the problem, and the necessity of preventing irremediable mistakes; but as the whole scheme was to be fully before the public after it had undergone the ordeal of discussion by the Dean and Chapter and the committees, Mr. Pullan was crying out prematurely. The sub-committee were surely entitled to a trial before condemnation, and most people were content to wait until June next for the experimental cartoons to be *in situ*. Friendly discussion and enlightened criticism would be unquestionably of great service at the proper time, but it was to be regretted that Mr. Pullan (who was so competent to enrich the "Transactions" of the Institute by dissertations on other subjects) should have prematurely brought forward the question of the designs for the decoration of St. Paul's. As Stevens's design was still *sub judice*, he hoped that neither it, nor the action of the sub-committee in adopting it, would be prejudged.

Mr. C. Henfrey said that, as a subscriber to the decoration fund, he must express his disappointment with the proceedings of the committee up to the present time, for they seemed to have devoted the whole of their attention to the decoration of the dome. He should like to see, when he entered St. Paul's, something like the decorative effect in the body of the cathedral which he saw at St. Peter's. The subscribers would like to see something for their money. He had heard the cost of decorating the dome in mosaics put at 40,000*l*. He doubted whether, after incurring that expense, the result would be satisfactory. For the greater part of the year the general effect of the figure subjects would be indistinct, and only the intervening "sploshes" of gold would be visible.

Mr. Ewan Christian said that with regard to the view urged by the last speaker as to the decoration of the body of the cathedral, Mr. Penrose ought to be consulted before anything was done in that direction. He believed that Sir Christopher Wren never asked for any decoration for the main parts of his structure, except only the dome, and he also believed that if Wren could have lived to see the results of some modern attempts at polychromy in churches, he would not have desired to put a bit of colour on the walls of the cathedral. He believed that Wren's intentions as to the parts of the building where he intended colour to be applied were very clearly indicated. Where he had not intended the stonework to show he had covered it with plaster. It was on that account, among others, that he had objected to Mr. Burges's proposal to skin the stonework of the interior and to case it with marble.

Mr. Penrose said it was distinctly stated in the *Parentalia* that those parts of the building which were to be decorated were coated with cockle-shell lime.

Mr. Christian, continuing, said it would be a great pity if Wren's grand work were destroyed by the general introduction of colour, however cheaply it could be done; but it could not be done very cheaply, for it had cost between 6,000*l*. and 7,000*l*. simply to clean the walls of the cathedral. He did not wish to pass any opinion on the design exhibited, but, from the sketch made by Mr. Stannus upon the blackboard, it appeared that the right thing was in contemplation.

Mr. Edward Armitage, R.A., said that as a painter who had had some experience in mural decoration, he might be allowed to say a word or two on the subject of the paper. He agreed that it was quite premature now to express an opinion upon the comparative merits of Mr. Stevens's design, or the modifications of it, and the one which Mr. Pullan had exhibited. It appeared to him (the speaker) that the dome did not require any decoration, for it was always lost in gloom. He would rather confine the main decoration to a frieze (such as that executed by Flandrin in the Church of St. Vincent de Paul, Paris,) running round the drum of the dome. If, however, the dome itself was to be decorated, he did not think it was a matter of much moment, from an artists' point of view, whether the subject chosen was the Apocalypse or the Te Deum, for to most observers who did not know what the subject was, a large number of figures painted in the dome would merely present a succession of riddles. He had no doubt, however, that Sir Frederick Leighton and Mr. Poynter would be able to show good reasons for their proposals, whatever they were.

Mr. J. P. Seddon, in proposing a vote of thanks to Mr. Pullan for his paper, said that while he agreed that the discussion of the subject in the form in which it had been brought forward was somewhat premature, it should be remembered that the subject was one to which Mr. Pullan had devoted much study. For his (the speaker's) own part, he so greatly admired the dome as it is, as seen dimly through the hazy atmosphere, that he found it difficult to conceive of anything that would look better or more beautiful. Before anything was done for the decoration of the dome, he should like to see some experiments tried on those parts of the cathedral which were nearer to the eye, as, for instance, upon the shallower domes, portions of the chancel, and other parts which seemed to lend themselves to, and even to cry out for, decoration.

Mr. Ralph Nevill said he was very glad to hear Mr. Armitage urge that very little decoration should be put into the dome. He thought that Stevens's design would be very suitable, *if* not filled in too solidly, and treated in a broad way so that no part should obtrude itself upon the eyes. But the suggested ribs should be eliminated, for ribs totally destroyed all the beautiful effect which was gained by building a dome.

The Chairman, in putting the vote of thanks to the meeting, said he thought they had had a most interesting discussion, which had at any rate served to bring the subject more prominently and more clearly before them. There would, however, be wisdom in waiting a little before coming to a conclusion on the subject.

Mr. Pullan, in replying, said his paper had been characterised as premature, but it was three years since the design he had exhibited was made, and he had waited year after year to see what the committee proposed. Mr. Stannus had made light of the ribs in Stevens's design, but they appeared to him to be the chief feature in it, notwithstanding Mr. Stannus's beautiful explanation of the circles. In the thrones in Stevens's design there were large figures seated, and those figures would appear from below to be supporting, Atlas-like, the large circles, not unlike huge spheres, above and behind them. Exception had been taken by Mr. Stannus to the statement that the committee had formed an alliance with Sir Frederick Leighton and Mr. Poynter, but he had not used that expression offensively, but simply as a statement of fact. Notwithstanding what had been said by Mr. Stannus in defence of the Wellington Monument, he (Mr. Pullan) adhered to his view that if Stevens had been a man of the greatest genius he would have seen the absurdity of cramming a monument of such dimensions into the circumscribed space which it occupied. However, on the main question, he trusted that, as everything advanced by opposition and criticism, the discussion of that evening would advance the decoration of St. Paul's.

PROVISION OF BUILDINGS FOR SCIENCE AND ART IN GERMANY.

The following sums have been set down for the requirements of science and art in Berlin in the budget proposals to be submitted to the Prussian Diet:—For the purchase of the Niederländische Palais for enlarging the Royal Bibliothek, 2,600,000 marks (130,000*l*.); for the acquisition of a site in the Potsdamer Strasse for the Royal High School of Music, 779,100 marks (38,955*l*.); for enlarging the testing laboratory of the Royal China Manufactory, 22,500 marks (1,125*l*.); for facing the Royal Schauspielhaus with sandstone, 135,000 marks (6,750*l*.); towards the building fund for the Natural History Museum at the Neue Thor, 500,000 marks (25,000*l*.); for the foundation of an Historical Seminary, 10,400 marks (520*l*.); for cleaning and arranging the objects found at Pergamos, 28,000 marks (1,400*l*.); for the Ethnological Museum in the Königgrätzer Strasse, 800,000 marks (40,000*l*.); towards the building fund for the Technical High School, 450,000 marks (22,500*l*.); for rebuilding the Silesian Railway Station, 150,000 marks (7,500*l*.); for the construction of a public mortuary for Berlin, 200,000 marks (10,000*l*.). Total, 283,750*l*.

FLOOD PREVENTION WORKS AT NINE ELMS AND BATTERSEA.

With the view of preventing the serious damage to houses and other property by the constantly-recurring overflow of the Thames, the Wandsworth District Board of Works are at present engaged in raising the river-wall at different points between Nine Elms, Battersea, and Wandsworth. These works are being carried out, amongst other places, at the Nine Elms-lane draw-dock; the entrance-gates to Downey's dock, dock-road; the public way to the river in Nine Elms-lane; premises in Albert-road; the public footpath at St. Mary's draw-dock; the footpath in front of St. John's Training College, Battersea; and the draw-dock at York-place, Battersea. The extreme abnormal height to which the river has risen within the last two or three years, during exceptionally high tides, has been ascertained, and at all the several points named the river boundary-wall at the water's-edge will be raised to a level higher than that which the tides have ever yet reached, which, it is expected, will be an effectual barrier against flooding in the event of future high tides.

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"ON SUNDRY WORKING DRAWINGS." *

I HAVE referred to the subject of roof tie-beams, the essential necessity of which our forefathers frankly accepted, as was their wont, and tried to make the best of. The modern mind, however, seems to abhor ties, and one of the problems that I have continually had to endeavour to solve has been how to construct church roofs without any visible ties, and that often to cover walls of less than Mediæval thickness, and of more than ordinary spans. In Kent and some other of the south-eastern counties, half-barrel shaped roofs are not infrequent, but they are generally provided with efficient supports in the shape of tie-beams with ring-posts and braces. There is one of early date, well moulded, at Salmestone Grange, near Margate. At Eythorne, near Dover, I succeeded in reproducing all these features in the new roofs, which I found it was absolutely necessary to substitute for old decayed ones. But at Great Kimbale, in Buckinghamshire, when I put a similar roof to the chancel of the parish church, it is even now in contemplation to cut away and dispense with the obnoxious tie-beam and king-post, because it happens, from some points of view, to appear to cross the upper part of the eastern window. This leads me to notice and to utter a protest, however unavailing it may be, against the absurd modern craze for an undisturbed vista from one end to another of our cathedrals and churches. All mystery and effect is thus sacrificed, and the interiors of our ecclesiastical buildings become as bald and as bare as those of barns. In the Church of Great Kimbale, to which I have alluded, I met with the worst example in my experience of walls having been thrust outwards by the spreading of their roofs, but I succeeded in restoring them bodily to their proper upright position, without having them rebuilt, as at first appeared necessary. This I was able to accomplish by the simple expedient of having them hauled up by ropes attached to windlasses outside passing through the opposite openings, after having previously disengaged the bases of the several columns of the arcades, and subsequently underpinning them.

It is noticeable that all these old church roofs were constructed, however rudely, in oak, and that they have owed their duration to the extreme tenacity of that timber, in spite of all the adverse circumstances to which I have called attention. They have in very many cases been renewed or altered at a far later date than the ages of good church architecture, probably in rude imitation of the former ones, but with inferior construction; or perhaps the timbers of the old roofs had become decayed at their feet only from contact with the damp walling, and their ends having been cut off, they have been re-used and re-framed, and so made to do duty again for a roof of lower pitch than the original. This may generally be discovered by finding the marks of the previous roof against a tower or the end gabling, and I lately found this to have been the case at the parish church at Betchworth, in the county of Surrey. In this case, also, disused and displaced mortise-holes betrayed the fact, together with the construction being inferior to any real Mediæval work, the struts having been only nailed to, and not housed into the rafters and collars. The roof had been covered with exceedingly heavy stone slabbing, which had been improperly bedded completely in mortar, which, by capillary attraction had rotted the lathings of the tiling and the ceiling between the rafters; these, again, being too close to each other, had left but little intermediate air-space (another frequent cause of similar disaster). The roof timbers had, in consequence, sunk under their weight, and become dislocated at their points of junction, and the walls had yielded to their pressure, and so the complete restoration of the whole had become imperative.

The present almost prohibitive cost of oak, and difficulty of getting it seasoned, import another element for consideration into this already sufficiently vexed question of restoration; for the character of construction, what was suitable to that denser material is not so when fir has to be used instead. As an example, therefore, of the manner in which I have endeavoured to solve this problem in connexion with that of the non-toleration of ties, I may call your attention to the working drawings which I have just prepared for this particular case at Betchworth. In the first place, I relinquished the use of the framed couples alone, which I consider is only desirable when oak can be obtained. For this treatment I have substituted one in which principals are introduced at moderate distances apart; and, to avoid the intrusion of ties, I have had to place the collars high up. I have made continuous curved braces to sustain them, and by connecting them thoroughly to the principal rafters reduced their thrust to a minimum. I find, however, in looking over my folios that in general I seem to have preferred to adopt, whenever I could, roofs with half-barrel shaped ceilings rather than those left open to the ridge, as in the last case described. The reason is that I consider the former the better adapted to maintain an equable temperature within buildings, and to give greater facilities for ventilation by means of the space that is left in them between their outer covering and the ceiling below the collars and braces, and also that they transmit better to a distance the sound of the voice. Then, again, the distance between the covering and ceiling gets rid of the danger of dry rot, already spoken of as very likely to occur when the covering is of tiles bedded in mortar or cement, and there is but little space for air between it and the ceiling, which, if of plaster, is impervious, whether this be between or below the rafters themselves. And yet the outer covering of roofs should be made impervious, or else it is but of little use to attempt to warm by artificial means the interior of a church. With the ordinary coverings used for the sake of economy, the heat evaporates through them almost as fast as it is generated, and the air of the interior, getting rapidly cooled by contact with the cold covering, descends, and causes the draughts so bitterly complained of by congregations. The least that ought to be done is to cover the rafters with stout boarding, ploughed and tongued, with asphalted felt laid upon it, and, above this, battens about 2 in. by 2 in. should be placed diagonally to brace the whole roof, and to allow any rain driven in under the tiles or slates to pass down to the eaves. The tiling or slating battens should be fixed upon these. I should even advise the boarding to be doubled, and to have plain felt between the two thicknesses, as well as the asphalted felt above them. Then the outer covering can be laid, as it should be, without mortar or cement. The construction of this class of roof will be that in which principals are used with purlins to support the rafters, and cradling to carry the ceiling; and I shall call your attention to the working drawings of several of such roofs in connexion with some of the buildings I am about to mention.

At Great Yarmouth I have had considerable experience in connexion with half-barrel shaped ceiled roofs of large spans. It was in the year 1862 that I received the commission to undertake the restoration of the noble Church of St. Nicholas in that town. This, as you are doubtless aware, is one of the largest, if not the largest, simple parish churches in existence. The special peculiarity of it is that all its aisles have the immense internal width of about 40 ft. This commission was the more gratifying to me as I had been entirely unacquainted with the place and its inhabitants until I was informed that the committee had decided upon offering the work to me. I mention this fact because, although for very many years my relations with this work were of the pleasantest, and I was permitted to control all that was done at the church, in order that one mind might guide the whole, after a time that rule became relaxed, and I resigned in consequence. I am glad, however, to learn that it has lately fallen into the able hands of Mr. Pearson, under whom I trust that the work may be satisfactorily completed. Some of the roofs and walls had fallen into a similar state of dilapidation to what I have been describing in other cases, and from the like causes. The first of the roofs that I had to replace there was that of the chancel, which has a span of only 25 ft. For this it was desired that I should, and I was able to, follow the old construction of framed couples, and to employ the same material as before,—that of oak. But when, later on, I had to undertake that of the vast south aisle of the nave, I found that practically neither was admissible, nor could I venture to introduce there any ties, as there had not previously been any. I therefore worked out the problem afresh, with fir for the material, and with principals and purlins and cradling for the ceiling, the result of which was entirely successful.

This Church of St. Nicholas, though very impressive from its great scale, is not satisfactory, in that its nave and chancel are less in width than their respective aisles, the former having about 25 ft. span and the latter 40 ft. In the new church dedicated to St. James, at the southern extremity of the same town, which is now in course of erection from my designs, I tried, while keeping somewhat to the same scale, to correct this disproportion, and so made the width of the central compartment about 35 ft., and that of the aisles 25 ft. The site that I had to deal with in this case was almost square, and I therefore adopted the Greek cross as the type for its plan. There are but four columns in the interior, and the central crux compartment is covered by a segmental dome of concrete carried by the four large arches and four smaller ones spanning the angles of the crux in place of pendentives. This it is my intention to have decorated with Rust's mosaic. In the pulpit I used the same material of mosaic in connexion with decorative stoneware from the Fulham potteries, resting on a base of polished serpentine. Such materials, some specimens of which have been sent by Messrs. Belham for your inspection, I have found to give facilities for the introduction of constructional and durable colours into buildings, the want of which I had long previously felt and deplored. The interior of this church is lined with buff-coloured brickwork, diapered with red, and its exterior is likewise constructed with considerable variety of colour in flintwork and red and black brickwork and stone dressings. The roofs are of the character of those described at St. Nicholas's; and indeed in the general size and scale of the parts I have tried to adapt in St. James's Church such of the characteristics of its mother-church as had impressed me with admiration, and had appeared to me to be desirable to introduce into the ecclesiastical architecture of our own time.

I now propose to lead you right across England to the opposite coast of Wales, where it has fallen to my lot to carry out some of the most important works that have been entrusted to me. My first introduction to that neighbourhood was in the year 1863, during which I received a commission from Mr. Thomas Savin, of Oswestry, to whom the principality of Wales owes a great part of its railway accommodation. That gentleman asked me to make a survey at Towyn, in North Wales, where he contemplated laying out for building all the land lying between two of the stations of his coast line. When that was finished he desired me to proceed to Aberystwith by a morning train, so as to be able to advise him in the evening of the same day as to some additions he proposed should be made to the building in that town known as Castle House, in order to convert it into an hotel. This was, as I found it, a large and complicated collection of buildings, of which the nucleus was a triangular structure with an octagonal tower at each corner. This central portion had been built by Nash, to whom London owes Regent-street. Having taken a rapid survey, I made a sketch design for a wing to be built southward of the above-named structure, along a narrow strip of land lying between the road and the cliff. This was intended to contain a large saloon to serve as a dining-room about 100 ft. long, having eight bay windows overlooking the sea, and at the further end of this was another octagonal tower. Mr. Savin approved this design at once, and desired me to lay out the foundations of it on the following morning, ordering some thirty men to be on the spot to receive my orders. This I accordingly did, after which I proceeded to town to complete and send down the requisite drawings. In order to provide as many bed-rooms over this saloon, without interfering with its area by any supports except those afforded by its external walls, I projected the outer face of the first floor to the front of the bay-windows by means of arches spanning from one bay to another, and constructed the partitions with queen-truss framing, which permitted of openings in the middle of the transverse ones for a central corridor. The longitudinal ones again rested upon these latter, and were framed likewise with openings for doorways in the middle of each of the rooms so divided off. These trussed partitions provided also the strength requisite for a flat roof over the whole, proposed to be covered with asphalte upon concrete, and

* From a paper by Mr. J. P. Seddon, read before the Architectural Association on the 24th ult. See p. 706, *ante*.

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to serve as a Belvedere, whence any number of visitors congregated on it might enjoy the extensive coast and sea views obtainable from it. This flat was approached by three circular staircases within turrets, from the saloon and bed-room floor and waiters' rooms. Since the conversion of the building into a college this space has been enclosed, and provides a large recreation apartment for its students. My employer, acting as his own builder, decided, to my regret, to execute this wing in brickwork, to be covered with cement. This being the case, I designed the upper portion in timber-framed construction, with brick panels to be cemented and ornamented with incised work and coloured so as to produce effect.

During the progress of this southern wing, I one day received a summons by telegram from Mr. Savin to go down to consult with him in the evening about the construction of another wing northward of Mr. Nash's building. I was again allowed no time for the preparation of working drawings, but was instructed to proceed then and there to carry out my approved sketch, 500 men being told off to execute the work, the whole of whom I had to keep well employed. This time, however, I was permitted to have my own way as to material, and I consequently selected Bath stone for the dressings, relieved by blue Pennant stone from Hanam, near Bristol, for the columns, and a local cinnamon-coloured stone from a quarry belonging to Mr. Savin for the wall work. The principal entrance was arranged in the centre of the building, at the back, where there not being space sufficient for any porch of an ordinary rectangular form, I designed the triangular one, which was erected, and gave every facility required. Adjoining the entrance-lobby on one side was the principal staircase within the tower, the plan of which is trefoil-shaped, next the street. On the side is a special staircase to what was intended as the billiard-room and its appurtenances. The billiard-room is of an oval form, and capable of holding three tables with bays on either side for spectators. Underneath this apartment, on the ground-floor, is one which was intended as the bar, and whence the approaches to nearly all parts of the building could be commanded. The intermediate floor was required to be of great strength, so as to obviate all danger of vibration to the billiard-tables. To accomplish this purpose, being indisposed to use girders, I designed a special system of flooring, in which, although the span is 25 ft., no piece of timber deeper than 9 in. was used. The joists, 9 in. by 3 in., were strengthened by struts underneath, disposed in such a manner as to carry a cradling for boarding ceilings, with moulded ribs, which were, in fact, shallow vaultings in woodwork, and possessed of very great bearing power. This same method of flooring I afterwards used for several of the other large rooms in this building, as well as in a mansion at Abennaide, near Aberystwith. For the large saloon, about 80 ft. long, intended as a drawing-room, and a smaller adjoining one in this north wing, I adopted trefoiled shapes for the plans of the bays next the sea, and utilised an irregular piece of ground on one side of the former for a series of vaulted recesses, separated from the room by a stone arcade with marble columns; and at the end of the room is a segmental apse with a range of traceried circular windows in stone, to be filled with ornamental glass.

Before leaving the neighbourhood of Aberystwith, I may mention some particulars in connexion with the restoration of the noble cruciform Church of Llanbadern, which originally was a cathedral, and is situated about a mile from that town. This has been a work which has extended over a very considerable portion of my professional career. It has been carried out in successive portions, as the collection of the necessary funds has permitted. It commenced with the restoration of the nave, and the rebuilding of the porch in the year 1868. The tower and transepts were restored in 1878, and the work to the chancel is now in progress. The first portion was begun before the establishment of the Society for the Protection of Ancient Buildings, which at the second stage in the proceeding, though they did not honour me with any notice of their intention, sent a protest to the committee against the further prosecution of the work. Other antiquaries, however, of equal zeal and ability, and greater courtesy, had at the very commencement interested themselves on behalf of the venerable fabric, in particular the Rev. Mr. Petit, to whom Llanbadern Church had always been dear, and who has given one of his characteristic sketches of it in his work entitled "Petit's Church Architecture." That gentleman, anxious to learn what was proposed to be done to the structure, asked Mr. F. Penrose, the architect, to confer with me on the subject on his behalf. Recognising at once the propriety of the feeling which had dictated this step, and the courteous manner in which it was conducted, I addressed myself to furnish sufficient accurate particulars to enable a fair judgment to be formed. I directed measurements to be taken at distances of 10 ft. apart the whole length of the church, from lines plumbed from the base, and these showed the precise amount that the thrust of the decayed roofs had pushed the walls outward. This, in fact, was found to be not less than 13 in. in a height of 19 ft. The consequence was that Mr. Penrose intimated to me that it was obvious that the condition of the fabric was as dangerous as I had reported it to be, and that the work proposed was necessary. The special characteristics of this church are extreme simplicity in combination with the grandeur that results from largeness of scale, each arm and the tower being 40 ft. wide externally. The only place where any richness of architectural detail had been indulged in was in the southern doorway, where the jambs were in three orders, shafted with rudely-carved capitals, and the arch was richly moulded, the details being of the characteristic Early English work of the district. All the original windows had been simply narrow lancets. These were rather curiously grouped in the west end of the nave and end of the south transept as triplets, one light smaller than the others being raised much higher. Those of the eastern end had been superseded, with an advantageous effect of concentrated light in that part, by a large Perpendicular window, with a smaller one of the same style on either side of the chancel. These, which are still dilapidated, the former having its mullions and tracery of wood, and the latter being blocked up with masonry, I propose to restore and reglaze. The original levels, or in some cases slopes, of the floors were sought for, and when ascertained were replaced. The floor of the nave was to slope upwards very considerably from the western end to the tower. In the new roofs which I had to design I adopted that character which my previous experience at Great Yarmouth had convinced me to be the best for such a span,—32 ft.; that is, with principals and cradling for the ceilings. The ceilings I have varied, increasing them in richness eastwards; and in that under the tower floor I have adopted wooden vaulting to support and make rigid the beams that existed before. In the same manner, in the chancel, its ceiling is made to serve the same purpose for its old but rude oak roof, which it proved possible to retain. In my designs for the flooring or paving and furniture, which were all necessarily renewed, I have introduced an increasing amount of richness of detail eastward, with the view of enhancing by contrast the effect of the extreme simplicity of the architectural features of the stone structures of the church, which I have not ventured to alter in any way. I may call attention to the working drawings of the pavement under the tower as being composed of the mosaic of Mr. Rust's manufacture in combination with tiles executed by Mr. Godwin, of Lugwardine, from special designs of my own representing subjects from the Apocalypse. In the chancel of Holmer Church, near Hereford, and in some other places, I have also used this same series of tiles, but without mosaic.

Having described the new Church of St. Paul, Hammersmith (of which we published the illustrations and particulars in our last), Mr. Seddon said,—In the work of building the new Church of St. Andrew, at Redruth, in the county of Cornwall, I am associated as joint architect with Mr. James Hicks, of that town. The plan is that of a very wide nave with exceedingly narrow aisles, intended to serve as mere passages; beyond are north and south transepts and the chancel and chancel aisles. The east end of the nave is polygonal below and rectangular above. The site is on the slope of a steep hill, and thus space is obtained underneath the western portion of the church, and this is utilised for vestry accommodation and for Sunday schoolrooms. The approach from the basement story to the church is arranged so that the choir may file upwards by two staircases around the font, and then uniting pass in procession down the central passage of the nave to the chancel. The district of Redruth possesses many striking varieties of building stone, most of which we propose to make use of in the following manner:—In the first place, granite will be used for all the quoins of the main angles of the building and for the buttresses. The chief element of expense in its use is that of the labour of dressing it, and not of the material itself, for the hills surrounding the town are chiefly composed of granite of the finest quality, samples of which may be seen in the balustrading of the Thames Embankment. The cost of working mouldings, undercutting, or tracery, however, renders it inadmissible for such purposes. Box-ground Bath stone, from the quarries of the Messrs. Pictor, has been chosen from among the west-country oolites, in consequence of its excellent weather quality, for the finer dressings of the outside, and Corsham Down for those of the inside of the church. But Bath stone will be used as sparingly as possible, and only for the finest of the dressings. The secondary quoins and bands shown on the drawings are of a local stone of a deep-brown colour, which when used alone for large masses of walling has a very sombre effect; but it forms an excellent bordering to inclose panels of brighter and more cheerfully-coloured stones, such as white and red granite spauls, spar, Alvan, and other waste stones obtainable there at almost nominal cost. The above stones, which are of light grey colour, will be used for plain arches. We hope thus to show in solid and picturesque construction the adaptability of the several varieties of the peculiar building stones of the immediate neighbourhood, and I am assured by Mr. Hicks that this result will be obtained at less cost than if any one particular kind of stone had been selected for use throughout, for while all those mentioned can be easily obtained in moderate quantities, no one sort can be had in sufficient amount without special quarrying.

THE PANTHEON.

At the last meeting of the Architects' Society of Berlin, Herr Adler read an important paper on the Pantheon at Rome, recapitulating the latest conclusions as to the origin and purpose of that celebrated edifice. Among the numerous archæological investigations which have of late been pursued in the Italian capital, there are few of greater interest than those connected with this building. Recent excavations have laid bare the ground in the immediate vicinity of the Pantheon, and have thereby raised afresh the question as to the object for which it was originally erected. According to one well-known theory, the Pantheon was simply a grand vestibule to the Thermæ of Agrippa, which stood immediately in the rear of it. Another view is that it was itself a great bathing-house, a swimming basin, or *frigidarium*. A third hypothesis is that the edifice was built prior to the Thermæ. It is certain that at one time the Pantheon and the Thermæ were architecturally connected. The other thermal establishments of ancient Rome all show great similarity of plan to the Thermæ of Agrippa; moreover, it is certain that the domes of the baths of Constantine and Caracalla were really employed as bathing-halls. But in spite of these facts there are technical and architectural data going to show that, originally at least, the Pantheon was not used for such purposes.

It was formerly generally believed that the architect of the Pantheon was Valerius of Ostia, and that the building was dedicated to Jupiter Ultor, but this view has long been abandoned. In the writings of Pliny and Dio Cassius, the name "Pantheon" is frequently met with, and this fact is the more important as the former author had seen the edifice in its original form as it existed prior to the great fire which, at the time of the Emperor Titus, laid in ashes a large portion of Imperial Rome, then a comparatively newly built or recently rebuilt city. We know from various inscriptions that have been preserved that the Pantheon was the place in which councils were frequently convened to deliberate upon affairs of State. We know from the same source, too, that it contained the statues of heathen deities. Moreover, Dio Cassius has recorded that Agrippa intended to erect a statue of Augustus Cæsar within the building, and to confer upon the edifice the

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name of the Augusteum. This honour, however, was declined by the Emperor Augustus, but he assented to his statue being placed in the entrance-hall and Agrippa's being set up opposite to it.

There appears, indeed, hardly a doubt that the Pantheon was erected as a common divine temple for the worship of the Gens Julia. The part of the city where it stood was at the time called New Rome, and was, in fact, the scene of the great architectural creations of Augustus Cæsar. The entire structure and fitting up of the Pantheon point with almost perfect certainty to Augustus, the ruler who had given peace to the world once more, as principally concerned in its origination.

Assuming, then, that the Pantheon was a temple of the gods and heroes, the further question arises, how many statues it contained. There were eight niches in it, one of them serving as the entrance. It is probable, therefore, that the statue of Cæsar stood in the principal axis, and that ranged on either side of him were those of Romulus, Julius Cæsar, Æneas, Anchises, Mars, and Venus,—from the last-mentioned goddess it is well known that Cæsar insisted that he was directly descended. Between the chief niches there were eight smaller ones somewhat projecting, and these possibly contained statues of other gods and heroes. A somewhat surprising fact in connexion with the dome is that the axial division of the ribs of the cupola does not correspond with the arrangement of the ground-plan. It shows multiples, not of eight, but of seven, whence it appears clear that the architect deemed it proper to lay particular stress on the niches occupied by the images of the gods.

Respecting the original distribution of the space and the construction of the Pantheon, the speaker had permitted himself in the year 1871 to publish his hypotheses on the "Winckel Programme." To his remarks then he now adds that the caryatides were erected in the interior by Agrippa, and that the interior capitals, probably for the sake of greater despatch in completing them, were of bronze. It has been conjectured that for similar reasons the caryatides, too, may have been made of bronze, and this would explain their disappearance at the time of the great fire.

At the close of the sixteenth century, Palladio, it is well known, took measurements and drawings of the Thermæ that were then accessible at Rome. Unfortunately this collection, which has been preserved, is not accompanied by any text or by a statement mentioning what was really in existence at that time and what additions Palladio may have made for the sake of completeness. It is, however, interesting to find that the newest excavations have confirmed the correctness of the plan he gives of the Thermæ of Agrippa. According to Palladio, there was no direct connexion between the bathing establishment and the Pantheon. The former, on the contrary, only touched the latter through a niche in which the remains of a pedestal are still to be seen, and upon which some large group or other was placed. It is established, therefore, that the Pantheon was never the vestibule to the Thermæ, nor was it itself a great swimming-bath or basin, or anything of that kind.

The Thermæ of Agrippa, as Herr Adler showed, contained not only bathing compartments, but all the fittings of a Greek gymnasium; and on comparing them with the Thermæ of the later Imperial times, it is found that the latter are simply a variation of Agrippa's Thermæ. It is, therefore, of special interest to know what was the origin of the latter. The grandeur of the dome and the monumental splendour of the entire plan of the edifice indicate at once that this cannot have been a first attempt, but that it was founded on preceding models. These were not in Rome. They belonged to a country where bricks were employed in building, a country where Oriental baths were required, and where gymnastics were practised after the Greek fashion. Hence it is probable to conjecture that the models of the Roman Thermæ are to be sought for in the Euphrates Valley, and in the period after Alexander the Great. The grand ruins of the city of Seleucia, which Sallust calls the greatest in the world, *maxima orbium*, have hitherto remained unexplored. But it is well known that Seleucia exercised an influence on cities to the West, especially on Antioch and Alexandria. It is more particularly the architecture of the last-mentioned city that deserves attention in this inquiry, as Alexandria was well-known to Augustus and Agrippa through the struggle with Mark Antony. It was there that stood the Soma, the colossal tomb built to contain the body of Alexander. There, too, was the Panion, an artificial mound or hill built after the style of the Babylonian and Assyrian terrace pyramids, with a serpentine passage leading to its summit. Let it be remembered that the tomb of Augustus at Rome likewise consisted of a great artificial hill or mound, and, moreover, that Egypt was the original land of all associations of deities. It will then appear that the unknown architect of the Pantheon must have come or derived his model from Alexandria.

The strange position of the Pantheon before the Thermæ, with which,—according to a former conjecture of Herr Adler's, a conjecture confirmed by the latest excavations,—it was connected by ten walls, is to be explained by the fact that under the circumstances it was only thus possible to erect the building at all. The old Romans hated everything Greek: they despised Greek gymnastics. It is, therefore, not improbable that, after the analogy of other traditional examples, the erection of the Pantheon was in the first instance only the result of a vow,—perhaps for the victory at Actium,—and that the thermal establishment was built near it purely as a matter of chance.

In conclusion, the speaker proceeded to defend the study of the origin of the Pantheon by the fact that it exerted enormous influence on almost all succeeding epochs of architecture.

MR. RUSKIN ON CISTERCIAN ARCHITECTURE.

"CISTERCIAN Architecture" was the subject of which it was announced that Mr. Ruskin would discourse on Monday last at the London Institution, Finsbury-circus, in lieu of "Crystallography," as at first arranged. Anticipating a crowded audience, our reporter, desirous of obtaining a seat convenient for hearing, arrived at the Institution forty minutes before the time announced, but he found every seat in the lecture-theatre, and even the steps of the gangways, occupied at that time, and had to content himself with a standing position in the gallery, which, with the approaches thereto, was greatly overcrowded. However much this overcrowding may have testified to the popularity of the lecturer, it likewise afforded testimony as to the badness of the arrangements,—indeed, it may almost be said, the utter absence of arrangements,—made by the officers of the Institution, who, when the theatre was full, should have refused to allow more people to crowd into it and into the approaches. The pressure of the crowd was so great that the progress of the lecture was several times interrupted. Ladies who had fainted could not be got out, owing to the one exit being densely packed with people. Had a panic arisen the results could not but have been very serious, and it is to be hoped that something will be done to mitigate this danger. Mr. Ruskin (whose voice is weaker than it was some years ago), contrary to his usual custom on such occasions as this, read from manuscript, and read somewhat rapidly, so that, under all the circumstances, it was impossible for our reporter to hear and record all that the lecturer said.

Mr. Ruskin, after expressing the pleasure which it gave him to be present, said he owed an apology to his audience for changing the title of his lecture. There was, however, a most consolatory paragraph in the *Globe* the other evening, which advised him that all his titles were equally good and appropriate, whatever the subject might be. Now, the *Globe* was rather in the right, for, in truth, the lecture on "Crystallography" would have contained a good deal about Cistercian architecture, and it was only by great self-denial that "Crystallography" had been excluded from "Cistercian Architecture." Among the circumstances of his early life for which he was most thankful, and for which he looked back with more than filial gratitude, was his father's fixed habit of stopping patiently at some roadside inn on his journeys into the country, while he (the lecturer) was making himself acquainted with every feature of the castle or every nook of the cloister which existed in the locality through which his father was travelling. In his visits to those romantic buildings immortalised by Sir Walter Scott, he took an interest, as a child, which had a marked effect on his whole subsequent life. Brought up in the strictest principles of Calvinism, however, he never heard his parents speak slightingly of those to whom we were indebted for the introduction and spread of Christianity in these islands, and never heard them cast any doubt upon the sincerity of the faith of Catholicism. But, in common with most English people of their day, they were suspicious of the monastic as distinguished from the clerical power, and it was an inevitable conclusion to a visit to Bolton or Jedburgh that it should be pointed out to him how careful the monks were to secure the richest lands of the most sheltered valleys for their abodes. But, admitting that to have been the case, were the monks to be reproached with selfishness? Did they labour for themselves alone? The sagacity which discerned, and the industry which redeemed, waste lands at riversides from inundation and fever should be remembered to the credit of the valley monks, who, primarily successful in agriculture and architecture, were to be distinguished from the higher or mountain monks, and from all subsequent brotherhoods,—whose life of meditation was inconsistent with those practical labours which are beginning to be discerned by history as being probably the most vital elements of civilisation during a period of which the lecturer could scarcely speak without sketching the rise and deline of ecclesiastical politics. There remained now only eighteen years between the close of the present year and the opening of the twentieth century, and these 2,000 years he would divide into four periods of 500 years each, which presented distinct series of phenomena. In the first 500 years we had the fall of the Roman Empire, the extinction of ceremonial paganism, the establishment of the early traditions of the Church, and the completion of the Vulgate translation of the Bible by St. Jerome. In the second 500 years the proper work of the Church began, the work of the hardworking saints, not of the St. Catherines, the St. Michaels, and the St. Cecilias,—although he was pleased to find that parish clergymen were beginning to recognise St. Cecilia, and he could not help wishing that she were a little more cared for at the "Monday Populars." In the third 500 years we had, in no small degree owing to the energy of the Cistercian order, the creation of Gothic architecture, including the resuscitation of the art of painting, lost with Apelles. In that period there were perfect laws of honest commerce depicted on the walls of churches; there was a perfect scheme of Christian education defined for the people on the walls; and a perfect picture of civil justice was afforded when the kings and barons of England submitted their quarrels to the decision of ecclesiastics. What had we to show as the products of the present and fast-concluding vista of five hundred years? We had printing, gunpowder, steam, dynamite, liberty, science, Parliamentary eloquence, and the Parliamentary *clôture*. There were strongly-marked and trenchant lines of separation between these four periods,—lines not always seen by historians, who, although they recorded the different locks of guns and links of armour that prevailed in different reigns, often seemed to regard it as a matter of no concern whether kings were enthroned under round or under pointed arches. In the year 480 there was born in Rome a boy, the son of a senatorial house, who was brought up during his childhood amidst all the pride, pleasure, and atheism of Rome, and, as Mr. Froude had said, there was no atheism like that which existed in Rome at that time. When the boy was fifteen years of age he resolved to break with these associations, and escaping from his father's house he took refuge in the hills of the Campagna. His friends made diligent search for him, but in vain. He founded, on the site of a Pagan temple, the Monastery on Monte Cassino,* whence was disseminated the Benedictine gospel, which taught that the performance of useful labour was man's duty on earth. M. Viollet-le-Duc had given a vivid picture of things as they were at Monte Cassino; he was most careful and impartial as an historian, and he (the lecturer) owed as much of pleasure and of profit to Viollet-le-Duc as an historian as he had suffered from the quite conscientious idea on the part of that distinguished man that Gothic architecture ought to be restored to its pristine power in the cities of France. Viollet-

* Some account of this famous abbey and of the work carried on there for centuries will be found in the *Builder* for 1879, p. 1198

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le-Duc's mistaken love for Gothic architecture had led to the destruction of many precious monuments by restoration at the hands of his assistants, and the work had been carried on since his death. He (the lecturer) was, however, glad to be able to pay a tribute to the perfect science of Viollet-le-Duc's structural architecture, and to the perfect candour of his history. We who lived in the present day could with difficulty conceive the disorder which followed the fall of the Roman empire in the West. In the midst of the chaos, the monks descended from Monte Cassino, and spread themselves through Germany and the North of Europe, founding monasteries which became centres of industry and homes of security for the peasantry. They restrained and controlled watercourses, reclaimed and cultivated waste lands, and in doing all this they set an example of self-denial which was not without its effect on the people. Before the close of the year 1000 the Benedictine order had founded no fewer than 15,700 houses or abbeys, each with its abbot, who was partly a schoolmaster, partly a bishop, and, it might be said, partly an innkeeper; in short, he was a man who was concerned for the welfare of the bodies as well as of the souls of others. He possessed power independent of, and often in rivalry with, episcopal pretensions. When Cluny was founded, its lands were given by the dukes of Aquitaine, and the walls were raised by the kings of France. Citeaux, on the other hand, was founded in a marsh by poor monks. The lecturer next proceeded, by the aid of a plan of the Monastery of St. Gall (enlarged from Viollet-le-Duc), to explain the arrangement of a Benedictine house. As showing the importance with which the work of the gardener was regarded by the order, it was pointed out that the gardener's house was nearly as big as the abbot's house. Opposite, and in due symmetry with it, was the doctor's house, with its separate garden for medicinal herbs. Then there were workshops and farm buildings. "Work-*shops*" he had called them, although there was no selling here,—all was given. At Cluny goldsmiths' and jewellers' work was the leading industry followed, and what sort of work was done there in those times was still to be seen in the brooch which clasped the mantle of St. Louis. At Citeaux and at Clairvaux other industries were followed, but in each establishment there was a monk charged with the distribution and organisation of the work. In conclusion, the lecturer observed that Cistercian architecture was kept subdued by the severe lessons of St. Bernard; and by restricting itself always to the materials close at hand, it succeeded in producing always beautiful structures; severe lessons he had called them, though they were really loving lessons in the true sense. The chief direction in which these lessons told in architecture was the forbidding of everything that was ludicrous and that was cruel. The life and labours of the Cistercian monks in building, in agriculture, and in the keeping alive of the learning of the ancients, were fraught with important lessons to the people of the present day, who were too prone to take as their motto "Let us eat and drink, for to-morrow we die." St. Bernard said, "Let us watch and pray, for to-morrow we live." He (the lecturer) felt much more like one who needed to be preached to than like one who should presume to preach to others, but he trusted he might be allowed to say, "Let us labour joyfully while we have light, for we know not what shall be ours on the morrow."

THE VICTOR EMMANUEL MONUMENT, ROME.

The Italian Government has determined not to carry out any of the numerous designs which were sent in early in the present year in the prize competition for the national monument to Victor Emmanuel, views of some of which we gave. On the contrary, it has decided to open a new competition. The committee charged with the supervision of the scheme held a meeting recently, the Minister of the Interior in the chair; and it was resolved that the conditions of the new competition should be as follow:—The Victor Emmanuel monument shall stand at the eastern point of the Capitol, in place of the Franciscan monastery and the barracks of the city police, occupied in ancient times by the temple of Juno Moneta, the base being equal to that of the church of Sta. Maria in Arscœli. The principal subject is to be an equestrian statue of the king. The front of the monument will look to the north and towards the Corso-street, which is to be lengthened up to the foot of the Capitol, and to be brought into connexion with it by help of a monumental free staircase. The designs are to be sent in by December 1st, 1883. The competition is entirely open, foreigners being permitted to compete with native artists on equal terms.

THE NEW LAW COURTS.

THE GREAT HALL.

The Great Hall of the New Law Courts, which is represented in our illustration, forms a most important feature in that series of buildings, and very naturally an architect of the late Mr. Street's ability did not overlook its importance. In it he has left us a structure which must challenge much criticism. The hall is undoubtedly a noble work, and is possessed of considerable dignity; its great simplicity, solidity of construction, and refined detail, cannot but merit the approbation of all lovers of Gothic architecture. With regard, however, to its proportions we are not quite so prepared to express unqualified satisfaction. We do not for a moment suggest that they are ill-considered, unpleasing, or unscientific; but they are so far removed from those which one expects to meet with in such a building, that the mind is certainly rather surprised, and apt to question such a remarkable departure from the general usage; and the first impression is that we are in the nave of a church. It must, however, be acknowledged, on behalf of the lamented architect, that in England, at least, we are unaccustomed to secular buildings of the precise style which he has here adopted; that we have no large halls with vaulted roofs; and that, owing to the unfortunate selection of the site, the building was cramped for space, and height was a necessity for the sake of efficient lighting.

The proportions of the hall are as follow:—Length, 230 ft.; height, 80 ft.; width, 48 ft. It is divided into nine compartments or bays by clusters of columns supporting the vaulting, which is domical, the domes springing from boss to boss instead of from arch to arch, as is the more usual practice; thus the arches which separate the bays occur at the highest portion of the dome, and the boss at the lowest. This gives the vaulting a rather singular effect when seen from either end of the hall. The building is lighted by very lofty windows of two lights, having richly-shafted jambs and mullions, except the two windows at the north and south ends; the former of which is a simple Early English triplet, and the latter a composition of five lancet lights with cusped heads. Below the side windows are richly-foliated cornices, and below this again large plain spaces left for future decoration. Round the lower portion of the hall the wall is adorned by a charmingly-designed arcade, interrupted at regular intervals by acutely-pointed double doorways, which possess very rich mouldings and foliated adornments. Beneath the large windows at either end are galleries. That at the south end is supported upon three arches boldly corbelled out; the centre arch opens to the vestibule, and the two which flank it form blank recesses; the whole is of Hopton Wood stone. The gallery at the north end is supported upon demi-vaulting springing from three corkscrew columns, and below are two open arches communicating with the great corridor. There are two smaller openings above leading into the balcony from the upper corridor. It cannot be denied that there is a good deal of cleverness about these galleries, but the detail is so very singular, and they have the appearance of being a late Gothic idea translated into early work. This is especially the case with the gallery at the north end. We cannot reconcile ourselves to the twisted columns; they introduce an element of weakness just where strength is especially wanted.

The pavement of this hall, which was executed by Messrs. Burke & Co., of Newman-street, from a design by the late Mr. Street, is a very fine work, composed of marbles of various colours arranged in patterns. The windows are glazed in ornamental patterns, with shields introduced in coloured glass, the work of Mr. Bell. The iron gates and grilles filling in the entrance arches, &c., are by Mr. Potter, of South Molton-street. The clerks of the works were Messrs. Lewis & Moore. We subjoin a list of the general dimensions of some of the principal halls in Europe, which will serve as a guide for forming an estimate of the size of the hall of the New Law Courts:—

1. The great hall of the Palazzo Ragione, Padua, erected between 1172 and 1219 (roof a century later): Length, 240 ft.; width, 80 ft.; height, about the same as the width.

2. Westminster Hall: External length, 270 ft.; * external width, 74 ft.; height, about 90 ft.; internal length, 240 ft.; † internal width, 68 ft.

3. The Wladislawschen Saal, in the Palace of the Hradschin, at Prague, completed in 1522, but commenced half a century earlier: Length, 212 ft.; width, 60 ft. Unfortunately the floor of this noble apartment has been raised, and its original height cannot be clearly ascertained; it is vaulted.

4. The Salle des Pas Perdus, in the Palais de Justice, Paris (commenced 1622): Length, 216 ft.; width, 84 ft.; height, about 60 ft. Unlike all the other examples named in this list, it has a row of columns down the centre.

5. Guildhall, London: length, 153 ft.; width, 50 ft.; height, about 60 ft.

6. Christ Church Hall, Oxford; length, 115 ft.; width, 40 ft.; height, 50 ft.

7. The "Golden Hall," at Augsburg, Bavaria: length, 110 ft.; width, 58 ft.; height, 52 ft.

8. Hampton Court Palace Hall: length, 106 ft.; width, 40 ft.; height, about 50 ft.

9. Middle Temple Hall: length, 100 ft.; width, 40 ft.; height, 50 ft.

10. Lambeth Palace Hall (rebuilt, in imitation of the ancient one, by Wren): length, 93 ft.; width, 38 ft.; height, about 50 ft.

The only one of these halls which is vaulted with a regular Gothic cross-vault in one span is that of the Wladislawschen Saal at Prague. Its length and width, compared with the hall of the New Law Courts, are as follow:—

Law Courts:	length, 230 ft.;	width, 48 ft.
Prague:	„ 212 „	„ 60 „

Thus it will be seen that the hall of the Law Courts, though considerably longer than the Prague hall, is far narrower; so much so, that the entire superficial area of the Wladislawschen Saal is 12,720 ft., whereas that of the Law Courts is only 11,040 ft.‡

The Royal Courts of Justice were opened by Her Majesty the Queen, with a state befitting the occasion, on Monday last. The ceremony in the great hall being concluded, the Royal procession arrived at the gate at the north-western corner of the great quadrangle, where the carriages were waiting. Here Her Majesty paused for a few moments, while Mr. Shaw-Lefevre, the First Commissioner of Works, presented Mr. A. E. Street, son of the late Mr. G. E. Street, the architect of the new Courts,§ and Mr. H. W. Bull and Mr. E. C. Bull, the contractors, to each of whom Her Majesty spoke a few words of congratulation. A deputation of the workmen who have been engaged on the building then came forward and presented the following address:—

"May it please your Majesty,

We, the workmen of the various crafts employed in the construction of this building which your Majesty has now been graciously pleased to open, desire to take this opportunity of offering a humble expression of loyalty and respect towards our Sovereign. We are deeply sensible of the honour which has been done to the work upon which we have laboured for so many years, and our one regret is that the great master whose designs we have carried out should not have been spared to see this day.

Signed on behalf of the workmen,

Thomas Epps,
Frederick Clarke."

To this Her Majesty's gracious reply was as follows:—

"I receive with pleasure the loyal address of the workmen of the various crafts employed upon this building. I congratulate you on the successful results of your honourable toil, and I join with you in the expression of sincere regret that the designer of this noble edifice should not have lived to see the completion of his work."§

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* This includes the modern addition to the north.

† Exclusive of modern addition to north end.

‡ Mr. Street's competition design was illustrated in vol. xxv. of the *Builder* (1867), pp. 112, 645; the plan of Court Floor, as determined for execution, was given in vol. xxviii. (1870), p. 666; and a view of the Strand front appeared in vol. xxix. (1871), p. 947.

§ Mr. A. W. Blomfield, to whom, in conjunction with Mr. Arthur Street, the completion of the buildings was entrusted by the Office of Works, was unavoidably absent through a domestic bereavement, which every one who knows him regrets deeply.

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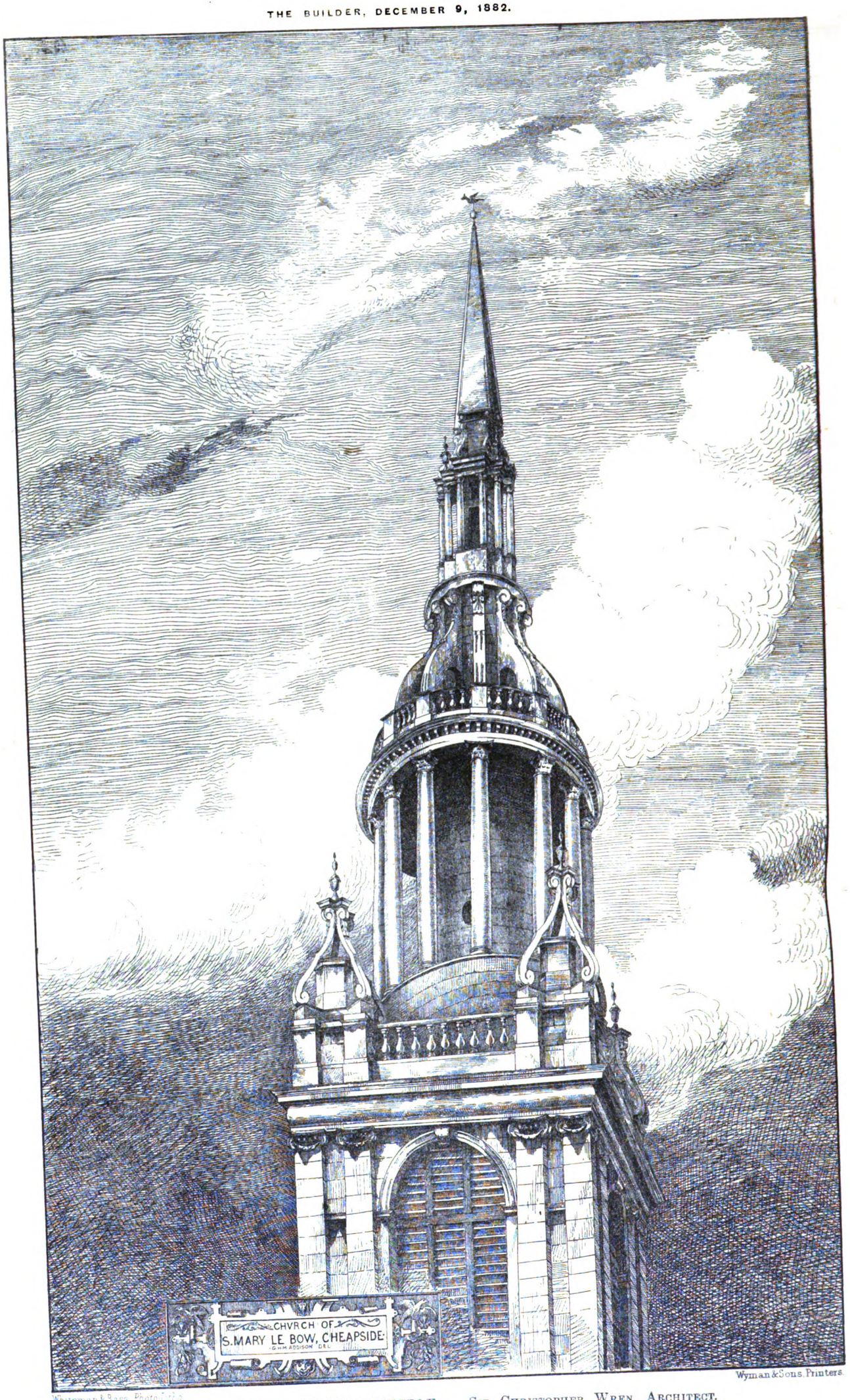

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THE CROWN OF THE STEEPLE.—Sir Christopher Wren, Architect.

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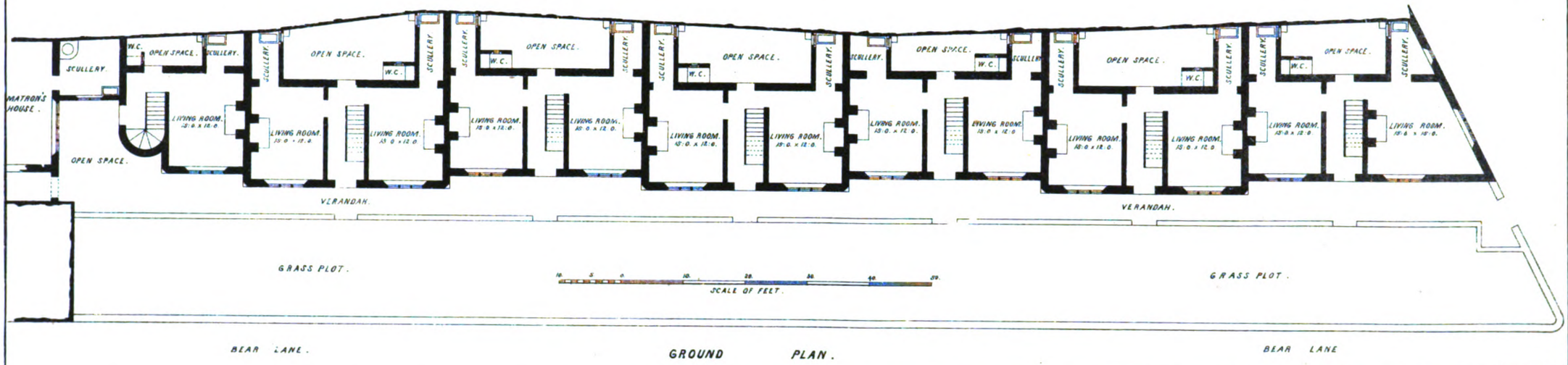
DR WHITE'S ALMSHOUSES BRISTOL



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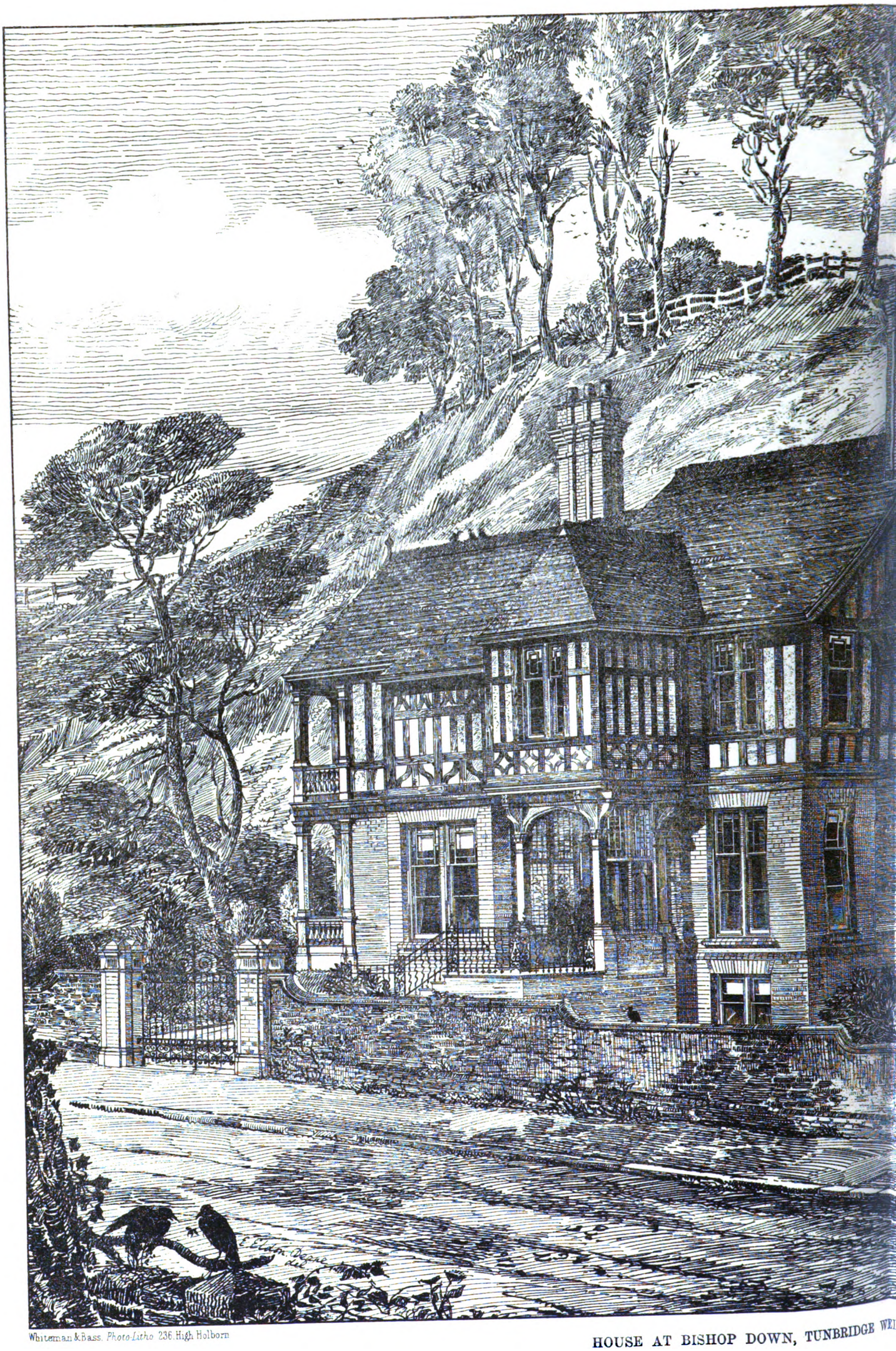

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HOUSE AT BISHOP DOWN, TUNBRIDGE WEL

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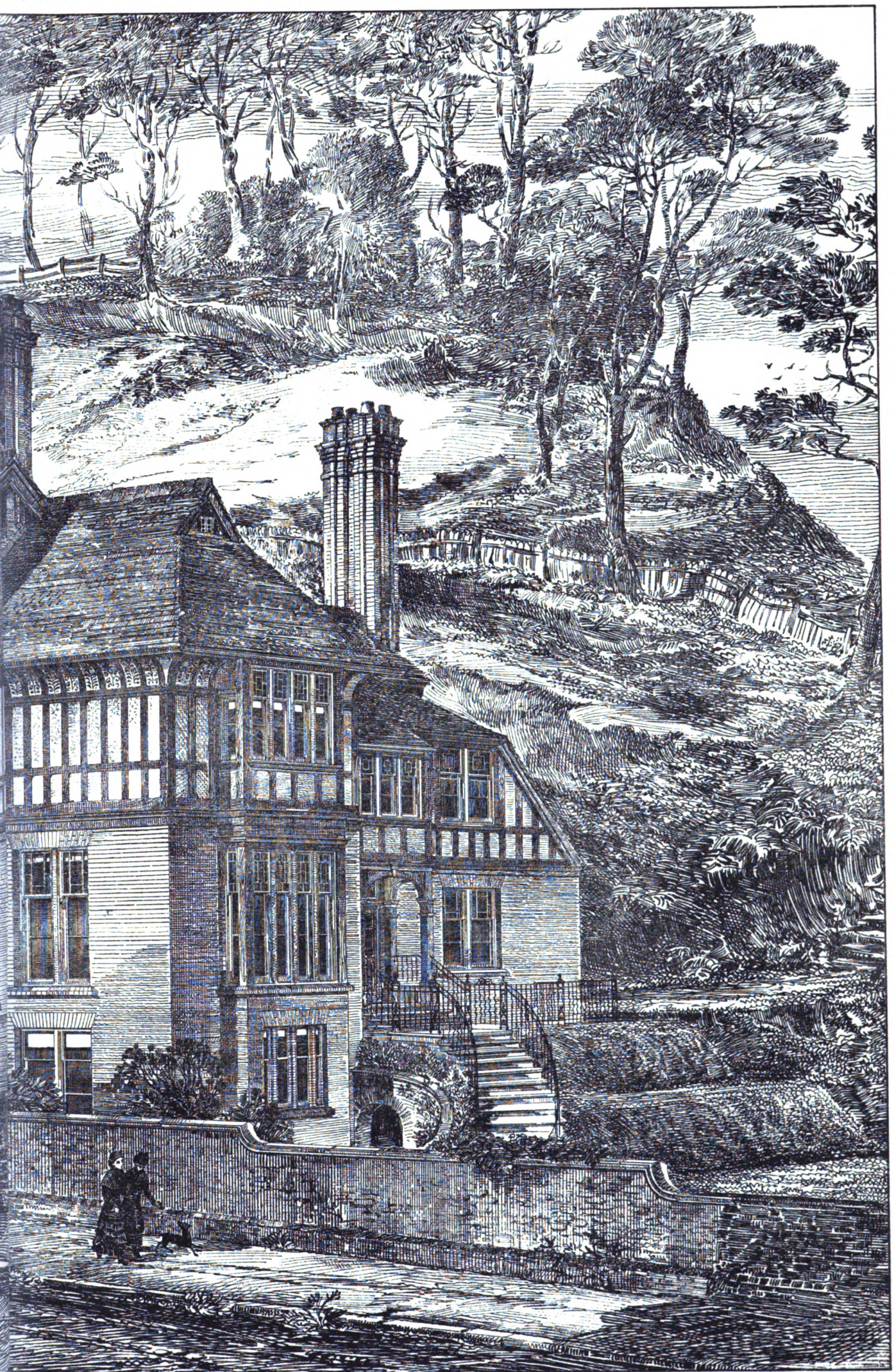

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—Mr. James Neale, F.S.A., Architect.

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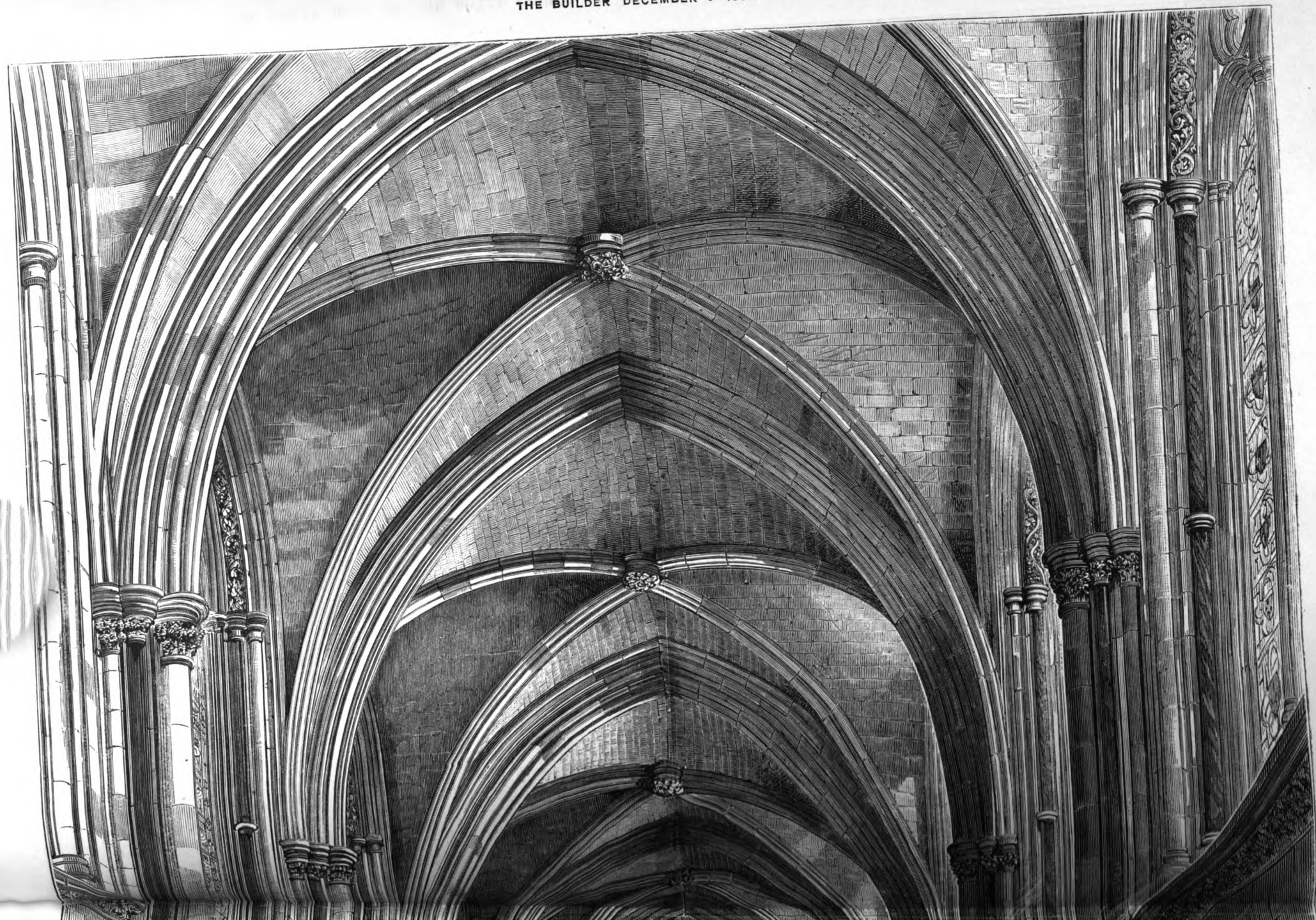

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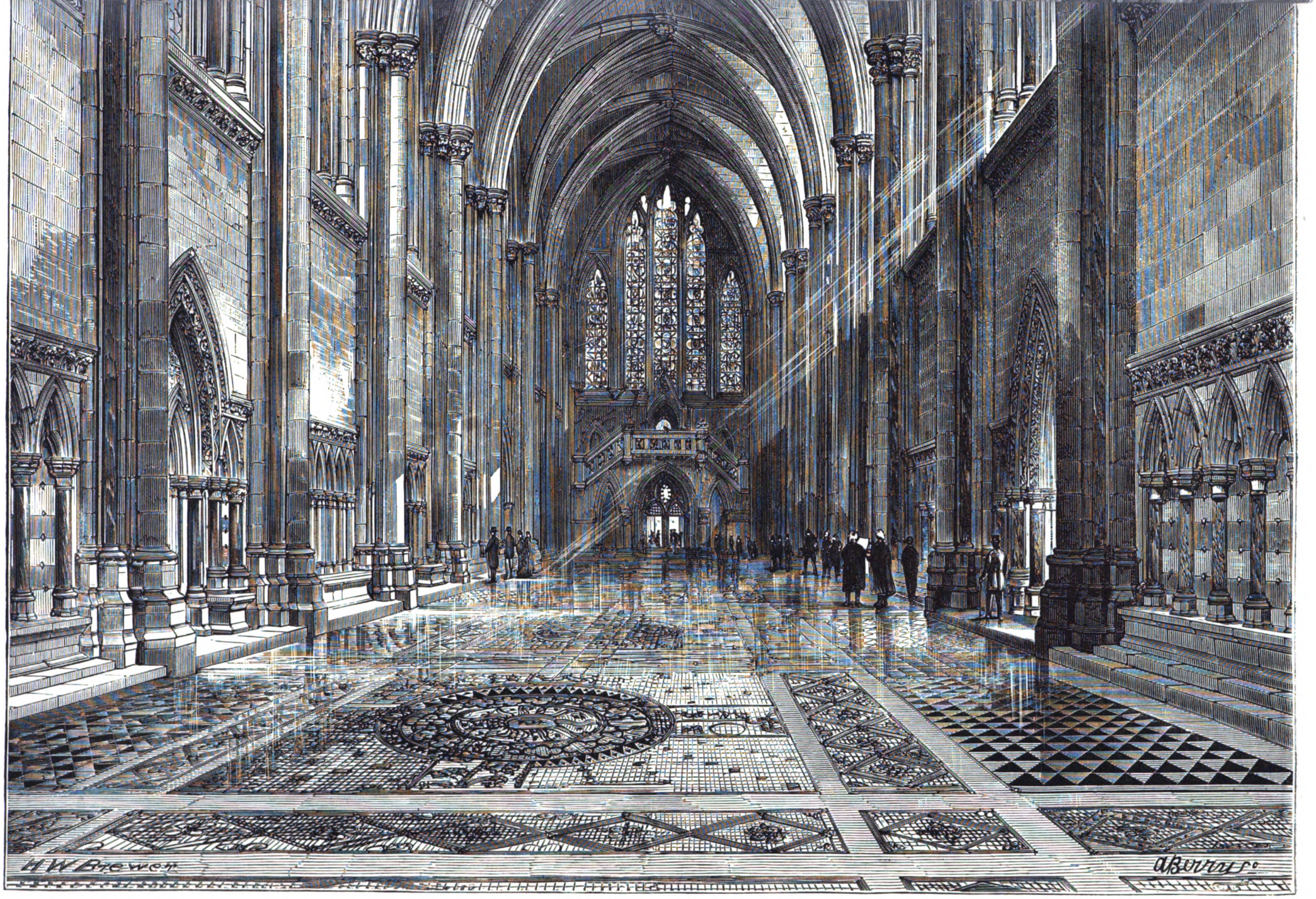

THE GREAT HALL OF THE ROYAL COURTS OF JUSTICE.—The Late Mr. G. E. Street, R.A., Architect.

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CHURCH OF ST. MARY-LE-BOW.

THIS church is interesting, not only as the central church of London, but more especially for its early story and for the skill shown in it by Sir Christopher Wren. The problem of the Renaissance spire has probably never been more satisfactorily solved than in this church. In its charming detail and graceful outline, it forms a perfect dream of beauty, and a study of its construction increases our admiration of the constructive skill of its designer. The sketch we give of the spire is by Mr. G. H. M. Addison.*

HOUSE AT BISHOP DOWN, TUNBRIDGE WELLS.

THIS house is situated on the border of the common at Tunbridge Wells, and has been erected for the residence of Mr. W. Edwards.

The lower stories are built of local red bricks. The Dunton Green bricks were used for all cut sills, arches, and ornamental work. On the upper story the timbers are combed in a dark oak colour, and the panels between are filled with pebble dash, the pebbles being collected from the sea-shore at Walmer. The half-timber work of the upper story is backed with brickwork one brick and a half thick. The roof is boarded, felted, counter-raftered, battened, and hung with local red tiles.

There was no competition, but a price was obtained from Messrs. Willicombe & Oakley, of Tunbridge Wells, to whom the contract was let for the sum of 1,520*l*. This sum was exclusive of the stoves, ranges, chimney-pieces, baths, boundary-walls, and stables. After the contract was let it was decided to raise the house, so as to secure more beautiful views of the surrounding country. This added a considerable basement story. Additional bed-rooms were also provided. These works were arranged to be paid for by measurement with a schedule of prices based on the quantities.

The house contains on the basement a parish room with a separate entrance, school-room, stores, coals, &c. On the ground-floor are drawing-room, dining-room, study, butler's pantry, kitchens, stores, water-closet, &c. On the upper floors are nine bed and dressing rooms, bath-room, water-closet, linen and housemaid's closets, and good stores.

The front side of the house facing the Common,—but not shown on our view,—has a large angle bay window, with balconies and verandahs. This arrangement was by special desire of Mr. Edwards, copied nearly in *facsimile* from a house erected at Walmer, from the design of the same architect, and illustrated in the *Builder* of December 17, 1881.

The house is nearly completed, and has been erected from the designs and under the personal superintendence of the architect, Mr. James Neale, F.S.A., of Bloomsbury-square.

DR. WHITE'S ALMSHOUSES, BRISTOL.

THESE almshouses, now being rebuilt from the design of the late Mr. J. H. Hirst, will accommodate thirty-two inmates, each having a combined living and sleeping room, 15 ft. by 12 ft., and 10 ft. high, with a separate scullery for each, and open yards with waterclosets at the back.

The walls are faced with Cattybrook red bricks, with courses and ornaments of Staffordshire black brick and Bath stone dressings from Corsham and Combe Down quarries. The roofs are to be covered with slates or Broseley tiles, gutters, and flashings of lead. In front, on the ground-floor level, will be a verandah from end to end forming a covered promenade in wet weather. Portions of this verandah will be of English oak, all the rest of the woodwork throughout the building being red deal. All interior woodwork to be varnished.

The aspect of all the houses is south, and the space in front will be laid with grass. The chief entrance is from Temple-street by a covered passage through the matron's house, which, being a modern structure, has not been rebuilt. There is also a carriage entrance from Temple Back.

The work is being carried out by Messrs. W. E. Walters & Son, of Bristol. The contract price being 3,250*l*.

* I send you a drawing of the spire, and will add one hereafter of the doorway.—G. H. M. A.

DEVELOPMENT OF SCIENCE AND ART BY THE EXTENSION OF THE EISTEDDFOD.*

IT is with considerable diffidence that I venture to solicit your attention to this paper, because I may have formed my conception of the purpose of the Eisteddfod at too great a distance, and without being fully acquainted with your views upon the subject. But it is an institution that has always deeply interested me, as it appears to be one that would admit of considerable expansion,—in fact, of being made a national instead of a local institution, such as, indeed, it was in ancient times, if the following account of it be well authenticated:—"Pliny and Tacitus bear testimony to the great knowledge which the bards brought to bear in the elucidation of the sciences of astronomy and geography; that they were masters of rhetoric and poetry, and that to learn eloquence their schools were crowded with the youth of Gaul."

To restore the Eistedfodd to its former grand proportions and wide-spread influence is the purport of my suggestions, for the time has arrived when the semblance, even, of a divided nationality should be minimised, and that as Englishmen we should appear to the world, in every sense of the expression, as members of a United Kingdom, and that the Eisteddfod should no longer be specially for the Welsh, but for us all. Your bardic traditions need in no wise be interfered with, but you yourselves, must be aware that the Principality can no longer claim the harp as exclusively its own. The harp is gradually becoming a national possession, and in no slight degree owing to the musical talents and pre-eminent mastery over that instrument of your Pencerdd Gwalia. In like manner I would desire to see the entire Queendom stimulated to high endeavour by a rightly-constituted and truly national Eisteddfod.

The foregoing introductory remarks must be my apology for appearing before you, and having tendered them, I will at once to my discourse.

One of the most important factors in the development of Grecian and of Italian artistic and literary excellence, was a consensus of judgment of a compact body of highly intellectual and cultivated men; the philosophers and their scholars in ancient Greece and the churchmen and the merchant-princes in Mediæval Italy, by whom the ideal was held up as the golden goal of human attainment, and by whom genius was taught to disregard all lesser aims. Those compact bodies of thinkers, moreover, were perfectly aware that literature and art were the most enduring monuments and true indices of a nation's intellectual status; hence the public buildings, in ancient Greece and in Mediæval Italy, became not only the shrines of religion, but of art, monumental edifices for all time. Unfortunately, however, in nations with such teeming populations as those of our own day, there is no such compact body of educated men, there is no such consensus of superior judgment, as of old time, to influence public opinion, to form the taste of the majority. Opinions are now very diverse upon most subjects, and as freedom of opinion is a primary article of the modern political creed; the aims of literature and of art are also diverse. There is no dominant influence, as there was in Greece and in Italy, tending to promote that unity of aim which is the great characteristic of the Classic and Renaissance literature and art. Unity of aim as society is at present constituted can only be looked forward to, as the outcome of a long, very long, war of contending opinions, ending in the triumph of the noblest forms of thought and of effort.

With the foregoing reflections present to my mind, it struck me that by gathering the greatest intellects of the nation to the Council of the Eisteddfod literature and art might in a short time be materially influenced by its sessional awards, and that the Eisteddfod might thus become, in relation to the general public, a substitute for that dominant and exalted intellectual guidance for want of which, in these days, literature and art diverge into all kinds of peculiarity, every one revelling in his own idiosyncracy and pursuing his own eccentric way. It may possibly be right to hold up freedom of opinion as the chief corner-stone of the political fabric, but let us, at the same time, thoroughly understand what that principle really means. And when we carefully analyse it what do we find? Why that "freedom of opinion" means nothing more than that every man shall be at liberty to think, and to assert tentatively what he thinks; for it cannot be maintained with the slightest show of reason that a man has the right to promulgate aught but the truth, aught but the right. Now, there is a certain at-one-ment or unison in all that is right, and therefore in seeking the right in all things the thoughts of a nation gradually converge towards those principles that tend to unity in purpose, to unity in work. There can, indeed, be no sound health, nothing progressive, in a nation that does not strive after that oneness of thought and purpose which centres in rectitude, that does not endeavour to shake its intellect free from the upas influences of prejudice. This is, in fact, the one only way by which a nation can attain to pre-eminence in all the higher kinds of work. We by no means wish to contend that the Eisteddfod should exclusively reward works of the highest aim. One of its functions is, as we are all well aware, that of rewarding and stimulating humble endeavour,—not as a finality, however, be it recollected, but as an incentive to more advanced attempts to higher kinds of work; but even in rewarding humble effort the position of the effort in the scale of attainment should be clearly indicated.

Although, then, this institution may stoop to reward humble effort, it should be known, as we contend, that its highest rewards should be held in reserve for the highest kinds of attainment,—not necessarily to be conferred upon the authors of any works submitted in competition, but upon the authors of any great works executed within the Queendom, and within certain limits of time. By these means a direction would be gradually given to emulation, which could not fail of having an elevating tendency on the literature and the art of the Principality,—nay, on the literature and art of the whole country. The awards of the Eisteddfod, *in excelsis*, should be for the loftiest kind of effort, in every pursuit; for such a policy would have the effect of gradually developing the institution to the importance, to the proportions, of its ancient prototype: for it was by a similar policy that the Olympian festival became so great an institution. It thus rose not only above provincial, but national prejudices. At that grand gathering every kind of talent was honoured and rewarded, every new notion was ventilated. In Greece, there was ever in her best days a spirit of noble rivalry, which made city contend with city, and citizen with citizen, in order to obtain an Olympian reputation. It was thus, too, that all national peculiarities were eliminated from the Grecian intellect and physique, and from Grecian literature and art, and that Greece became the exponent of the Ideal. It was to that free emulation, so wisely encouraged, as well as the incentives offered to the pursuit of the higher forms of attainment, that her unexampled progress as a nation may be attributed. When I say that the award of the Eisteddfod, *in excelsis*, should be for the highest kinds of success, I do not desire to lose sight of the fact, as I have already hinted, that this institution has two important functions to perform, viz. (1), that of promoting the highest aims in the Principality and the nation at large, in order to keep the true goal of human effort before the masses; and (2), that of lifting humble effort within the Principality itself. The Eisteddfod, too, should have its student's crown to be awarded to him who shall obtain the highest honours in any of the schools of the Principality during the year, or on any Welsh student who shall distinguish himself during the same period in any art or science, and anywhere in Great Britain. The certainty that excellence will be duly recognised is a great stimulus to endeavour in all the fields of intellect. These rewards should be simple and inexpensive,—a metal laurel wreath, if you will. It is an infatuation to suppose that a country may be developed to its best issues by routine and red-tape proceedings; under such a policy, a Chinese stagnation settles down upon it; it becomes effete. A great nation can only maintain her greatness by protecting, by rewarding, and by bringing talent to the front.

There is another point to which I would also direct your attention, a point in which your festival fails to follow the example of its great prototype, the Olympian, viz., in its physical contests. Why should not athletic games form a part of your programme? There is, perhaps,

* From a paper by Mr. W. Cave Thomas, read at recent Eisteddfod.

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still a certain stigma attaching to contests of physical strength, but this is so only because they have been in some degree discarded from the rule and governance of humanity. Bring them within its pale, and they would be moderated, humanised, — encouraged only to that extent that tends to the development of health and beauty. Moreover, in encouraging athletic games, within due limitations, the Eisteddfod would set an example, not only to the country at large, but to the schools and colleges of the Principality, as to the rightful extent to which physical exercises should be permitted. The physical contests at Olympia and those which occurred in the Roman arena stand out in strong contrast, exhibiting in the one case their use, and in the other their abuse and degradation. A few years since some suggestions of mine having reference to the restoration of physical contests to the session of the Eisteddfod, were printed in several of the leading papers of the principality. It may be urged that athletic games are not required by a population so extensively occupied in mechanical and laborious pursuits, but I do not suggest their introduction specially for this class; although our experience of the customs of the counties farther north would teach us that such sports do find favour with a labouring population. With this class athletic games are frequently the first step in culture. The transition from excessive muscular exercise to brain-work is neither consistent nor healthy. A constitution of the Eisteddfodd such as I propose, however, would leave it open to every man who should enter the lists of competition to exercise his own judgment, and to choose for himself that kind of complementary contest which he should deem the best calculated to effect the rounding of his own nature. No athletic exercises would be forced upon any one, but they should, nevertheless, be recognised at the session of the Eisteddfod, knowing, as most of us now well do, that they conduce to well-being, to the development of the proportion of true manhood. I may have spoken of the Eisteddfod in the plural number, but I very much question whether it is to the best interests of the Institution that more than one Grand National Eisteddfod should be sanctioned; and this great gathering should, of course, be on a scale of sufficient importance to attract competitors and visitors from all parts of the United Kingdom.

Connected with the department of athletic sports, should be your annual rifle and artillery competitions.* We are too apt, as a nation, to persist in beaten tracks, in the prejudiced belief that these must necessarily be the royal and permanent highways, and so we tenaciously cling, as a nation, to our old naval and military ways. The rifle, however, has more than any other weapon transformed the art of war, and we must promptly meet the change of tactics that it involves. Recollect, too, that the successful defence of a nation of expert marksmen is virtually guaranteed. The principality offers many opportunities for obtaining splendid rifle ranges, and there is no reason why Welshmen should not become first-rate marksmen. The building up of an institution like the Eisteddfod to its full proportions, and as I, and some of you may, in imagination, contemplate it, would require the united energies of several enthusiastic and hard-working men determined upon making it, not merely a local, but a national institution. It would, doubtless, require large pecuniary resources, too, but these would, in all probability, be readily forthcoming for a national, when they could only be obtained with difficulty, if at all, for a merely local project. To speak of the undertaking of so complete an organisation in the most matter-of-fact way, we believe that if it were carried out on the grandest scale it would pay a good interest on the capital invested. Prosaic minds may erroneously suppose that no solid advantages are likely to accrue to the State by creating incentives to excellence such as those I propose to extend and to improve. Such minds conclude that the benefits derivable from the awards of an Eisteddfod are merely of an unsubstantial and transitory kind. The benefits accruing are, doubtless, more of a moral and intellectual kind; but for every advance of this order, you may rest assured there will inevitably be a corresponding advance in the arts and sciences, and, therefore, in the power to improve the material resources of the country. Depend upon it, ladies and gentlemen, you cannot throw too much enthusiasm and energy into the establishing of your Eisteddfod in its grandest proportions, and in rendering it pre-eminently complete and fit in every respect as a centre of incentive to every kind of noble and manly endeavour; and if you desire, as I know you do, that the material production of this great country should, in all departments, culminate in the highest pitch of excellence.

The foregoing considerations lead me, by way of conclusion, to touch upon the subject of the choice of a locality for the holding of the grand National Eisteddfod. I have already expressed the opinion that you should not dissipate your power by multiplying gatherings of the kind, and to this opinion I cling. Let there be but one to be looked forward to with interest, and as the occasion for a public holiday. Let it be held, too, in a locality judiciously chosen as central, and as generally accessible as possible. I, myself, believe that the primeval Eisteddfod was an echo of the Olympian festival wafted to us by the Bardic, or priestly, traveller of the Druidic times. Moreover, I believe that, for whatever other purposes they may have been used, those interesting remains at Avebury and Stonehenge, were the permanent structures that were periodically utilised for the primitive Eisteddfod, when supplemented with temporary wooden construction and a covering of either hides or canvas. But be this as it may, I would exhort the directors of this Institution to be solicitous with regard to the choice of a locality, when they shall have fully determined to awaken the Eisteddfod to its full life, and to develop it to its grandest proportions. To me it would appear to be a matter of certainty that in the course of a few years you will be in possession of a permanent structure in which the Eisteddfod shall be held, and which shall be a monument of British aspirations as enduring as those ruder remains of the primeval national spirit.

* It is by no means essential that these competitions should take place in the same locality as the Eisteddfod, nor simultaneously, but somewhere, and somewhen not too remote, and with the knowledge that such gatherings were special sections of its organisation, and that successful competitors would receive their reward at the Eisteddfod. These remarks are also applicable to the athletic sports.

HOW OUR PUBLIC IMPROVEMENTS ARE CARRIED OUT.*

Let us turn now to the larger and most important of the impending schemes of improvement, that for the building of new Admiralty and War Offices, the suggested block plan for which has been for some time known to architects and those specially interested in the subject, and has been published by the First Commissioner in his article in a contemporary periodical. The history of the scheme for the rebuilding of these offices affords the most striking example of the unsatisfactory and unbusiness-like working of our Government machinery in dealing with these matters. The operation has been under discussion for more than a quarter of a century. Commissioner after Commissioner has had his schemes, committee after committee has sat, talked, proposed, and done nothing; and the affair now culminates in a feeble make-shift "economy" plan, the economics of which have been rendered necessary, chiefly by the continual procrastination of any settled scheme for purchasing land and compiling the plan and design of the buildings. By far the best, finest, and most convenient site that has been proposed for the desired structures is that on the north side of Great George-street, parallel with the block of the India and Foreign Offices, and running up to Parliament-street, the present western boundary of which street, at that point, would, of course, have been set back so as to widen it, and carry out in this way a much-needed and long-promised improvement. Probably at the time when the idea was first mooted, the Great George-street site might have been acquired for half a million; now it is said to be worth more than twice that, and is to be abandoned from motives of economy, after nearly a quarter of a million has, however, been expended in a bit-by-bit tentative acquirement of property on the site, which, for any immediate purpose to which the Government can put it, seems to be now practically money thrown away. The present writer does not claim to be a financier, but it seems patent enough to any one that if there had been a permanent administration, combining the best surveying and architectural ability available, to look after these matters, instead of their being left to be the plaything of a succession of First Commissioners of Works, money and a fine architectural opportunity would have been saved. The Great George-street site would combine the public offices in one great group near the centre of Government, and would give the hint for a rebuilding of the south side also of Great George-street at no very distant date, thus furnishing a fine architectural climax to the boulevard of Birdcage-walk, and a noble approach to the Houses of Parliament from that quarter, the mean aspect of which at present contrasts sadly with the great towered building beyond.

The new scheme consists in squeezing in the new offices between the Horse Guards and Messrs. Cocks & Biddulph's bank, projecting backward over a considerable portion of Spring-gardens, in such a way that the Whitehall elevation and the Park elevations must appear almost as different buildings, and no unity of architectural effect can be realised. Here again we see the result of the utter want of continuity in what may be called building politics. Had this scheme been contemplated for any length of time, it should have been the bounden duty of some one to negotiate for the sites of the Messrs. Drummond's and Messrs. Cocks & Biddulph's banks before they were built; the existing houses between them could then have been easily acquired at no exorbitant price. But now the banks in question are built, and the cost of disestablishing them would be very great; though some of us may think that it would be worth while to pay a good deal merely to clear so poor and commonplace a building as the former off a fine site which it completely spoils. Had the whole frontage been secured, there would have been the opportunity of producing a fine mass of buildings in the new work, and of so arranging them as to run the line of the Mall through into Charing-cross, thus securing a beautiful as well as a much-needed new route.

The First Commissioner, however, tells us we need not mind that, as he can provide a road into the Mall by Drummond's Bank, with room for two carriages to pass; and, if we have a cab-route, what can we wish for more? Let architectural effect go; we need not trouble about that, for are we not going to save money? That is the whole of the argument that can be urged in favour of the new site: it is economical. Even if the banks were bought, however, and the entire site and its possibilities secured, it would not be such a desirable one as Great George-street on architectural grounds. It would involve the removal of the Old Admiralty and its adjuncts, which are really of some interest in their way, more so than anything in Great George-street (except one or two of the old houses west of Delahay-street), and the new building and the Horse Guards would materially injure each other. Far better, on architectural grounds, to group all the new office buildings together, and unquestionably better on practical grounds; and it may still appear that the wiser economy will be to purchase the Great George-street site, and note down the increased price at the present day as one of those pieces of experience for which we all have to pay heavily. One of the practical objections which is urged against the site, that the street is largely occupied by the offices of professional men who are under the necessity of being near the Houses of Parliament, may easily be dismissed. As soon as it was known that this site would be used, new and superior offices would certainly be built on every available plot in the neighbourhood; the demand in such a case is always met by a supply. It is worth note that the block-plan of the new buildings shows them arranged around quadrangles: this is one of the least sanitary principles of arranging large buildings, especially where their height must be considerable, unless the quadrangles are very large; even then the re-entering angles are apt to become receptacles of stagnant air. Wherever the buildings are ultimately erected, this should be reconsidered.*

Of other schemes that appear to be specially talked of, that of removing the houses in Abingdon-street and Old Palace-yard, opening out a

* From a paper by Mr. H. H. Statham, in the *Fortnightly Review*.

* In cases where a quadrangle seems the only means for securing the necessary accommodation, it might be worth while to try the effect of placing the main staircases in the angles, leaving them partially open for a through current of air. This might be made to realise a new and picturesque effect, arising out of strictly practical requirements, which is just what we want to see more of in modern architecture.

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view of the adjoining portion of the Abbey, and forming a new cloister for monumental erections, is an old idea of Sir C. Barry's, which was much favoured also by Sir Gilbert Scott. The throwing open of the Abbey on to what would then form a grand architectural *place* is a noble scheme, but I would prefer to see the new cloister, or "Campo Santo," on the space which has often been talked of for such purpose, the square plot of ground south of the Houses of Parliament, which is now laid out as a very forlorn-looking green, or (by courtesy) garden, with no flower-beds or any other adornments, and which no one seems to frequent. The new cloister would then group with the modern buildings, and the Abbey be left with its genuine Mediævalism undisturbed by modern imitations. The idea of adding to and raising the present façade of the National Gallery, by way of increasing the architectural dignity of Trafalgar-square, is hardly to be approved. The old façade is not, as Mr. Shaw Lefevre says, without a certain merit of its own, but it is essentially a feeble piece of architecture, and nothing really fine could be added which would blend with the existing details; the choice must remain between tolerating the existing façade or replacing it by an entirely new one.

This is a very venial error, however, compared with the remarkable proposal which is seriously entertained for "treating" the Tower. The idea of that proposal is, after removing the block of storehouses which stands between the river and the Tower, and the very mean-looking building which abuts on the south wall of the keep, to rebuild the inner wall of the tower, and the lantern tower, upon their old lines, and in imitation of Mediæval work, and thus to carry out the process (of which there is only too much done already) of producing a mock-Mediæval tower,—as Edie Ochiltree would have said, "to make an antic of it." Mr. Shaw Lefevre is quite practical in his remarks as to the present utility of the Tower, and the necessity, after these unsightly buildings have been pulled down, of providing the same accommodation otherwise; and straightway he proposes to express this practical value of the Tower as a modern armory by giving it the aspect of an imitation Mediæval fortress. To rebuild it, he tells us, in any way but as a reproduction of the ancient fortress, "would be to repeat the error of those who constructed the unsightly buildings now to be removed, and could not be entertained for a moment." There seems to be a curious confusion of ideas here. The removal of the buildings referred to is, no doubt, desirable; not, however, because they are modern, but because they are bad, and badly placed. The remedy is to build better and more suitable ones; nor could there be any more interesting problem in modern architecture than to produce in such a case an addition to the Tower which would be fitted for its practical purpose, would represent the spirit of the time in which it is built, and at the same time harmonise with the massive style of the old portion of the structure. That would be a thing worth doing. But if Mr. Shaw-Lefevre really imagines that Salvin's modern-antique bastions and machicolations are looked upon with interest, or that "those who reverence and respect the past" will be impressed with a second edition of the same sort of article, he must have lived very much out of the way of recent lines of thought about art and architecture. He may be assured that with the majority of those who take an enlightened interest in the subject of architecture such a proposal would only be received with laughter, as it has already been wherever we have heard it commented upon or referred to.

The foregoing remarks are not intended to disparage the acquirements of the present First Commissioner of Works, whose capacity for dealing with architectural improvements is certainly not inferior to that of the majority of those who have preceded him in the office. It is his special misfortune to have been tempted into a much more energetic exercise of his office than most of his predecessors have thought it worth while to undertake, and to have done so under unsound official advice. The real mischief is in the system rather than in the individual. At every change of Government, the conduct of matters with which politics have no more connexion than mathematics with lyric poetry, is handed over to the hands of an official placed in his position for political reasons, who has probably given no special study either to the practical or the artistic side of architecture, and who has suddenly to assume a knowledge of the subject, and to appear as the arbiter of our architectural improvements. In one instance the choice fell on a person so notoriously destitute of any qualifications for such a post that the appointment was generally believed to have been a kind of grim joke on the part of the statesman at the head of the Government. One perfectly natural result of this is the want of any continuity of principle in dealing with public works. It is the object of each successive First Commissioner to mark his temporary reign with his own individuality, and to supersede the ideas of his predecessors. This disadvantage would be much lessened if the Parliamentary official were under the advice of a really competent permanent official; and formerly this was recognised. At one time the late Sir James Pennethorne, a very able man, was the architectural adviser to the department. At a later period, after some changes in the administration of the Office of Works, Mr. Fergusson was appointed "Inspector of Works and Buildings," in accordance with the recommendation of a Committee of Inquiry, to the effect that, "The First Commissioner requires the aid of an officer conversant in a high degree with architecture, in reference to questions connected with existing or contemplated buildings." But we have changed all that. Mr. Fergusson resigned shortly after the appointment of Mr. Ayrton as First Commissioner, not probably caring to expose himself to the amenities of that remarkable specimen of the British ædile. One or two successors followed and retired, and the present Permanent Secretary, who had been secretary in conjunction with some of the architectural officials, by a process of exhaustion of the architectural element was left apparently master of the situation. There is no wish to say anything here in the way of unnecessary comment on individual deficiencies; but this is a matter of public importance. It ought, also, to be one of public interest, and it is time that some one should say what many people know well enough, that the present permanent official has given evidence of no qualification in regard to previous training or to present knowledge of architecture, either practically or artistically, to render him a fit person to direct the architectural improvements of London, or to give advice thereupon to the Parliamentary officials, and that it is but the bare truth to say that, in any assembly of men well educated in art and architecture, his opinion on such subjects would go for absolutely nothing,—or less than nothing. As to the value he himself sets upon architectural design, Mr. Mitford has been, indeed, imprudently candid. He declared before a Parliamentary Commission that any great building that was required would be most satisfactorily carried out in the offices of the Department, as it would involve "only the engagement of a few more draughtsmen." Precisely so: and the results of that way of looking at it, where we are unlucky enough to have them, are what might be expected. The New Post-office buildings and the Bow-street Police Court are draughtsman's architecture, and the plan of the Hyde Park Corner improvement is a draughtsman's plan; and bad at that. The direction of the architectural improvement of London is, therefore, in the hands of whatever politician it may be convenient for a new Government to nominate as First Commissioner of Works, under the advice of a permanent official, who may be an excellent secretary and man of business, but to whose opinion on matters architectural no one who really understands such subjects attaches any value whatever. It remains to be seen whether educated public opinion will not demand the appointment of a permanent and specially qualified "Minister of Public Works,"—whose jurisdiction should be independent of political changes,—or at least of a permanent architectural adviser of the highest class; or whether we are to continue indefinitely a system such as would not be tolerated in any other first-class city in Europe.

St. George's Chapel, Windsor.—The work of restoration of St. George's Chapel, Windsor, which has been going on for some years, has just been completed so far as the present year is concerned. The work has been carried on by the Dean and Chapter under the direction of the Chapter surveyor, Mr. A. Nutt, and includes filling the vacant niches with the statues of Royal benefactors.

THE BURNING OF THE ALHAMBRA THEATRE.

As our readers are aware from the daily papers, the Alhambra Theatre was entirely burned out on Wednesday night, or, more correctly, Thursday morning last. Whether anything is known as to the probable or possible cause of the fire it is impossible to say at the time of writing these remarks. The fire appears to have been first perceived by the police about one o'clock in the morning, and at two the whole place was in a blaze, throwing its light far and wide over London. Regarded from the De Quincey point of view, the fire was a remarkable success, and originated some splendid effects. In St. James's Park the effect of this lurid and unwonted "northern light," with every branch and twig of the bare trees standing out in a black network against the light, was very remarkable, and a thing one would like to see painted; but this was surpassed by the effect in Trafalgar-square. Nothing could have been better arranged for a grand *coup d'œil*. Below the columns of flame and smoke lay the long dark mass of the National Gallery, all its detail lost by contrast with the glare above; while on the right Gibbs's steeple rose in a column of intense light against the black sky, glowing like molten silver; the blaze brought out other tones from the buildings on the south side of the square, and raised the whole for the moment into the region of architectural poetry. It would be worth while for any painter who may have seen it to try a picture of the effect. In Leicester-square an equally striking but more weird effect was produced by the spectacle of the burning building, the sound of the dull, heavy thuds from within as the large girders successively went down, mingled with the peculiarly unearthly noises of the steam fire-engines planted in various parts of the square. Under a canopy of smoke and sparks, which spread all over the square, hundreds of people were collected to witness the sight. A picturesque incident in the scene was the aspect of the two large turrets or minarets at the extremities of the façade, which were on fire at various points, and often in the full thick of the flames, but gave evidence of the solidity of their construction by the way they retained their position. The northern minaret settled about a foot out of the perpendicular, towards the building, and one expected to see it come down every moment; but up to the time when the fire began to subside, having burned itself out (about a quarter to three) the two turrets were still standing. The house adjoining the theatre northwards took fire, and was apparently gutted, in the upper portion at least, and at one time it looked as if there were some danger of an extended conflagration; but every effort was evidently made to keep under the flames in this house, and the fire does not appear to have spread further.

This latter point, working for the safety of adjoining buildings, is evidently regarded in such cases as the best line of tactics to employ; and no wonder, considering the utter futility of the means at hand to do anything towards keeping down the main conflagration in the case of a fire on a great scale. To see the masses of flame within the theatre, and the jets of spray playing upon them (for the column of water from the hose is broken into mere spray in its passage through the air) suggested a contrast almost ludicrous, if the occasion and the possible further consequences had not been so serious. One might as well think of putting out Pandemonium with a garden squirt. Surely it is time that some decisive effort were made to place at our command a more effective weapon against fire than the fire-engine of the day furnishes, and one of which the effects should be more proportionate to the means employed. As it is, we have in various parts of London large and handsome fire-engine houses and offices, costly engines, relays of horses, and a splendid staff of fearless and daring men; but what does all this accomplish? When there is a large fire, the fire-engines certainly arrive with great dramatic effect, careering through the streets and through crowds of people in a manner which affords a refreshing contrast to the sober everyday habits of our street traffic, and they commence snorting and belching sparks like so many demons, and floods of water are sent running down the streets; but all the result is the pumping of a few showers of

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broken spray into the burning building, the effect of which upon the fire is absolutely *nil*; indeed, the gases into which the water is instantly decomposed seem to replenish and strengthen the flame. It is evident to any one who looked on at the fire on Thursday morning, that our present tolerably costly fire-extinction service and *matériel* is utterly powerless to produce any effect whatever in reducing a large fire. The water was duly and regularly poured through the nozzles of the hose directed up against the windows of the burning building, but for any apparent effect produced it might as well have been poured down the street-gutter. Any means which would throw water in heavier and more solid streams might be effective, but probably we must turn to chemistry for the real solution of the problem how most quickly to reduce a great fire when it has once got fairly started.

Another consideration which naturally arises in reference to this particular fire is the emphasis which it gives to the conviction which is gaining ground, both in official and non-official quarters, of the danger from fire in theatres, and the necessity of enforcing the most stringent regulations as to construction and means of exit. Several of the more self-confident of our theatre managers (a race not deficient in that same quality of self-confidence) are talking as if they were very ill-used by the Lord Chamberlain in being expected to do so much more than formerly was expected of them in regard to fire-resisting construction and safety in the plan and arrangement of their buildings. Here is one more big theatre-fire to testify that theatres, as now constructed, are exceptionally liable to fire,—places containing many lurking-spots for fire to commence and develop unobserved, and much to feed the flame when it is once started. It is fortunate that the fire at the Alhambra did not break out until some time after the closing of the house, and that nobody's life was endangered by it. But the cause of it must have been something connected with the usual operations of the theatre; something which had commenced to burn before the house was locked up, and was left smouldering unnoticed. The same thing might have taken place at nine o'clock instead of at closing time, and then it is terrible to think what the nature of the disaster might have been. Whatever efforts managers may have been compelled to make lately to lessen the risk of fire in their buildings, the burning of the Alhambra comes in as a reminder that such risk is still one which especially attaches to theatres, and that we must proceed with improving the system of construction, plan, and supervision of theatres, until we render them as little liable to risk by fire as other buildings of public resort, which at present they certainly are not.

A WANT AT NETLEY HOSPITAL.

The attention which, during the past week, has been directed to the Royal Military Hospital, Netley, by the visit of her Majesty the Queen, renders timely a remark which for some weeks past we have been anxious to find an opportunity of making. It is one on the due observance of which it is possible that the saving of many a valuable life may hereafter depend.

Of the site, the plan, the service, the aim, and outcome of the hospital we do not now propose to speak.* It is simply to express regret that in one particular item, that of the staircases, there should be a singular and lamentable shortcoming. We speak, it is true, only from the experience of few visits paid to patients in the building; but that experience is complete so far as it goes. And if there be in any portion of the noble pile a feature for which we have failed to give it credit, it is none the less true that it has not been made in any way available in recent cases of the carriage of sick or wounded men into the establishment.

We allude to the staircases. These are rather suited to a barrack than to a hospital. They are strong and substantial, floored with that compressed and indented wood with which the stations of the Metropolitan Railway have made us familiar, and quite suitable to the use of the orderlies or male attendants on the service of the establishment.

* The plan of this hospital was originally very bad, as we pointed out in its earliest days (if not before its erection). Since then, however, if we remember rightly, improvements have been made in this vital respect.

But if regarded either as architectural features, or as means by which invalids have to walk or to be carried from floor to floor, they must be spoken of in a very different manner. They are so steep as to try the wind of any but a very hardy climber. For an invalid to walk up them would be a difficulty, and something worse. Nor are they better suited to the carriage of a patient on a stretcher. Too narrow to allow of the stretcher being carried sideways, and thus kept on the level, they enforce a very unpleasant angle on the appliance. And when, as will some times happen, and as did actually occur in a case within our own personal cognisance, the feet are carried foremost up the staircase, the strain on the patient is severe, and might not improbably prove fatal.

In a building of the grandeur of Netley Hospital,—it is, we believe, fifty yards more than a quarter of a mile long,—if erected in Italy, the Grande Scala or staircase would form not only a prominent and very striking feature of the building, but a means of access of the most admirable kind. Most admirable, that is to say, so far as relates to this mode of entrance alone. A broad flight of easy steps, as in the cases not only of the Royal Palaces of Naples and of Caserta, but even in such a building as the Palace of the Ministries at Naples, which has many features in common with an edifice like Netley Hospital, gives free access to corridors, story above story. Ascent and descent are easy to the pedestrian. And in the case of its being required to carry any one up or down, the ample width of the stairs would allow a litter or stretcher to be carried horizontally, so that the patient would not be exposed to the discomfort inflicted by a narrow stair.

But all this might have been written one, two, or three hundred years ago. Grand feature as such a staircase is, it is far inferior, as matter of convenience, of safety, and especially of comfort to an invalid, to a lift. How it is that a building of this magnitude, dating, if we remember rightly, only as far back as 1857, should be unprovided with mechanical lifts, may well be inquired. For the patients the difference would be incalculable. For the service of the house, although this is as much as possible self-contained on each floor, it would be every way preferable to steep and somewhat noisy staircases; and then, unfortunately, it is not all the patients who recover,—another obvious reason for the introduction of lifts. We beg to call the very serious attention of medical and other authorities of Netley Hospital to the strong need that exists for the introduction of mechanical lifts. Even if only one were provided at the back of the house, a branch being run from the railway to the very foot of the lift, so that with only one short transport the sufferers could be at once taken from the train that brings them to the hospital to the floor on which their wards or private rooms are situated, the gain, in cases of severe illness, would be immense. In the interest of the army, in that of humanity, in that of an establishment bearing the term "Royal," we hope that we shall not have pleaded in vain for the addition of lifts to Netley Hospital.

MODERN SANITARY LEGISLATION.

A comparison of the various legislative measures adopted by the leading civilised nations of the world for the furtherance of the cause of hygienic reform is an instructive lesson for any one interested in the cause of sanitary progress. An opportunity of this description was recently afforded by the opening paper read by Prof. Reklam, of Leipsic, at the Brunswick Hygienic Congress, in which he defined sanitary legislation as carrying out the principles which should really guide all states in the framing of laws, namely, the removal of all impediments to the corporal and mental development of individuals, thus rendering each subject as capable as possible of contributing to the general welfare. He considered the system of hygienic legislation in France as being fairly well planned but inefficiently carried out. Much the same state of things exists in Italy and Spain, though in the latter country the Medical Boards are doing good service at present. The position of sanitary matters in Belgium he considered as exhibiting a kind of compromise between the systems in operation in France and Germany. The *Conseil Central de Salubrité publique* is there the leading sanitary authority, and although not in a position to enforce its recommendations, they are voluntarily submitted to by nearly all the local authorities of the country. In Holland, each district has its sanitary council, but there is likewise in each case an inspector appointed by the Government, who acts as an intermediary between the local and national authorities. He considered the state of things in Holland as being relatively satisfactory in consequence of this system.

He attributed the increased attention given during the last forty years to sanitary matters in England to the cholera epidemics, and the consequent increase of mortality. The first law was passed in 1848, although efforts had been made since 1839 by private and public organisations to arouse the needful interest in the important question of hygienic reform. In Germany, he remarked, progress had been slower, but now an efficient system is provided by the Imperial Sanitary Administration, with its various local organisations. In some States the local medical bodies elect members to the Boards representing groups of districts, and these Boards send deputies to the head administration. In other States comparatively little progress has been made, on account of the apathy of those concerned, and Prussia is, more than any other State, open to such a charge, sanitary legislation being there in a backward condition. An improvement is, however, looked for ere long.

The American Sanitary Administration has the power of naming officials, and of issuing special injunctions. The adulteration of food has recently occupied much attention in the United States. In Switzerland there has been by popular desire an abrogation of some laws affecting sanitary matters.

The speaker considered that the fault of all modern hygienic legislation consists in the fact of its having been in most cases enacted at different times, and thus not forming a harmonious whole. Two sanitary codes have come into force, however, within the last year, which he quoted as models of what legislative enactments of this kind ought to be. In Finland, Prof. Hjelt has devised a law which meets all the requisite emergencies. In every town there is to be a sanitary commission, which consists of the chief of the police, the municipal architect, the local medical officer, and three town councillors. The whole *surveillance* of sanitary matters is in their hands. This law deals with town and country hygienic measures in a uniform manner, and provides for children's playgrounds in every town.

The regulations now in force in Servia place the authorities of that country, according to Professor Reklam's view, in the front rank of sanitary reformers, Servia being the only European country which has an independent sanitary budget. Its hygienic code has been elaborated by Dr. Gjoryjorics, and although only introduced last year, is now in practical operation. There is an annual revenue of nearly 50,000*l.* devoted to sanitary measures.

ART EXHIBITION BUILDING, ROME.

The permanent Art Exhibition Building in the Via Nazionale, Rome, is fast approaching completion, as also the temporary erection on the site of the future Via Genoa. By means of the electric light the work is carried on after dark, and the inauguration is fixed for *circa* Jan. 16. An illustrated journal, "L'Espozione delle Belle Arti," will appear in Rome on the opening of the exhibition, and will be continued while it lasts; it will then probably be published under some other title. The art editor of this journal is Sig. Foli, Piazza Nicosia 25, Rome. The approaching art exhibition is to be threefold,—Modern Art, Retrospective Art, Ancient Art. The exhibition of modern art is to comprise work done in the last decade, that of retrospective art in the epoch from Canova and Camuccini. The exhibition of ancient art will be in the Academia S. Luca. The Italian Government has voted 200,000 lire for purchases of paintings exhibited; the municipality of Rome, 50,000 lire. The royal family will also devote a large sum to purchases, and various provinces. The exhibition of ancient art is divided into ten classes: 1, architecture; 2, house and church decoration in sculpture and painting; 3, ceramic; 4, jewelry, plate, bronzes, and other metals; 5, armour and iron work; 6, intaglio and intarsio industry; 7, historical portraits and costumes; 8, tapestry, lace, embroidery; 9, Numismatic collections, &c.; 10, ancient documents, engravings, leather, and parchment. The proposal of the Municipality of

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Rome to alter the Palace Altieri by converting the ground-floor into an arcade, thus enlarging the street, has been rejected by the State Council, and the demolition of part of the palace determined on. The Palace Torlonia is to be levelled to permit a regular square at the junction of the Corso with the Via Nazionale. The Palace Strozzi and an adjoining house will be demolished, and the Via Nazionale will then be carried from the Place de Termini to the Bridge St. Angelo, traversing the Place della Valle and Place Chiesa Nuova. The Corso is also to be carried to the foot of the Capitol, and to effect this, part of the smaller Palace of Venice and buildings beyond will be levelled.

THE RATHHAUS AT VIENNA.

THE "iron man" (the *Metallarbeiter* says), which has attracted much interest in connexion with the above building, is really made of copper. The figure represents a powerful warrior clad in Mediæval copper armour. The energetic features of the countenance are seen through the open visor. The whole of the remainder of the body is covered with armour, coat of mail, &c. In the right hand is a banner about half as high again as the figure, which is itself 9 ft. in height. The statue is fixed on a pedestal, which is fastened by iron screws to the roof. These screws weigh, it is stated, over 2 cwt. each. As a further measure of precaution, an iron ball weighing nearly a ton is suspended from an iron bar which runs vertically through the pedestal.

MACHINERY AT THE SMITHFIELD CLUB SHOW.

ALTHOUGH there was a very large display of machinery and appliances in connexion with the eighty-fifth annual Cattle Show of the Smithfield Club, held in the Agricultural Hall this week, there were not very many exhibits which were of special and exclusive interest to the building trades. Among the exhibitors in the arcade entrance from Islington-green were Messrs. Henry Wurr & Co., of Blomfield-street, who showed a hand-feed planing-machine which will plane and true-up ready for a glue joint any piece of wood up to 12 in. wide. This is a strong and cheap machine, and likely to be highly appreciated wherever it is used. The same exhibitors show a substantial saw-bench, with a rising and falling table instead of a movable spindle. The "Ord" gas-engine, made and exhibited by this firm, appears to be a great success. It is simple in construction, and claims to be the only atmospheric gas engine fitted with a "governor." Messrs. Lewis & Lewis, of Cambridge Heath-road, were also exhibitors of some good wood-working machinery, including the "Westminster" hand-feed planer, which is well worthy of notice. They also showed a combined circular saw-bench and band-sawing machine, and the "Kensington" and other mortising machines. Messrs. Tushaw & Co. were amongst the exhibitors of wood-working machinery in the arcade, and among their exhibits was a very useful little machine for rapidly punching hoop-iron, and which is likely to be much appreciated by packing-case makers and others. Messrs. John Warner & Sons, of the Crescent Foundry, were exhibitors of pumps and other appliances for which they are noted. In St. Mary's Hall, among an odd jumble of things, we noticed some useful wood-working machinery shown by Messrs. Hempsted & Co. (late C. Powis & Co.), of London and Grantham. Among the exhibitors of steam engines may be mentioned Messrs. Aveling & Porter, of Rochester; Messrs. Barrows & Stewart, of Banbury; Messrs. Clayton & Shuttleworth, of Lincoln; Mr. Hindley, of Bourton; Messrs. Ruston & Proctor, of Lincoln; and Messrs. Ransomes, Head, & Jefferies, of Ipswich. Messrs. R. Waygood & Co., of Falmouth-road, Great Dover-street, were exhibitors of a high-pressure horizontal engine, very simple in design and exceedingly well finished. Messrs. E. R. & F. Turner, of Ipswich, made an interesting display of their specialities. Conspicuous amongst these was one of their patent automatic expansion portable steam-engines, of 8-horse-power. These expansion engines are now well known and appreciated. A 4-horse-power portable engine of the ordinary type is also shown,—a thoroughly well-constructed engine, possessing several important points of merit. The "Gippeswyk," engine appears in two of its various forms, viz., as a vertical portable engine, mounted upon iron travelling wheels, and as a horizontal fixed engine. These engines are fitted with the new Patent Turner-Hartnell Automatic Expansion Governor, a special adaptation of the Hartnell Patent Governor. The "Gippeswyk" engine is one of the best of the small-power engines now in the market. Corn mills,—another leading speciality of this firm,—are well represented, a number of mills of different sizes being shown.

ELECTION OF A DISTRICT SURVEYOR.

AT the meeting of the Metropolitan Board of Works, on the 1st inst., one of the first items of business on the agenda was that relating to the appointment of district surveyor for the district of St. James and St. John, Clerkenwell, and part of Islington, rendered vacant by the death of Mr. R. L. Sibley.

There were in all thirty-five candidates who had made application for the appointment, but the voting only took place upon thirty,—five of the applicants being struck off the list,—one (Mr. H. H. Bridgman) for not being present when his name was called; a second (Mr. F. C. Notley) had withdrawn his application on the ground of ill-health; while two of the remaining three gentlemen wrote asking to be excused attendance on the ground of illness or domestic bereavement. The fifth candidate whose name was struck off (Mr. A. T. Taylor) was stated to be on a visit to America.

The following is a list of the candidates who were present, with the number of votes recorded for each in the preliminary voting :—

Name.	Age.*	Votes.
Ashbridge, A.	30	27
Brooks, C. W.	39	11
Buxton, W. J.	37	3
Carritt, E.	34	32
Cheston, H.	32	6
Edmeston, J. S.	38	19
Elkington, G., Jun	31	20
Ferguson, J. M.	37	5
Grellier, W.	35	7
Hamilton J.	38	4
Hunter, P.	31	22
Inskip, G.	34	1
Jackson, G.	34	5
Karslake, L.	38	10
Lean, G. A.	36	7
Lees, W. H.	39	18
McLachlan, H.	30	13
Marsland, E.	29	17
Mundy, T. E.	38	7
Pownall, R. E.	34	9
Renton, O.	34	2
Scrymgour, W. H.	30	18
Solomon, L.	34	5
Spiers, W. L.	34	10
Stenning, A. R.	37	22
Stevens, W. H.	39	17
Stock, H. W.	31	1
Street, E.	34	18
Tanner, A. W.	39	29
Todd, F.	48	17

The six candidates who received the highest number of votes in this preliminary voting were Messrs. Ashbridge, Carritt, Elkington, Hunter, Stenning, and Tanner. The subsequent voting was as follows :—

	Second Vote.	Third Vote.	Fourth Vote.	Fifth Vote.	Final Vote.
Ashbridge	14	—	—	—	—
Carritt	29	27	25	27	23
Elkington	17	13	—	—	—
Hunter	17	16	13	—	—
Stenning	21	20	18	15	—
Tanner	22	23	20	23	15

Mr. Carritt was, therefore, the successful candidate, and he was accordingly appointed to the office, subject to the usual conditions.

THE USE OF CEMENT IN THE CONSTRUCTION OF SEWERS.

IN commenting upon the recent utterances of various sanitary engineers on this question, the *Thonindustrie Zeitung* states that recent examinations made at Frankfürt showed that the cement, mortar, and the concrete used (nearly four years ago) in the construction of the system of drainage have completely withstood all influences to which they have been exposed, and as they get older become harder. In the case of surfaces of concrete their hardness and smoothness have been fully maintained, and in no place could any trace be discovered tending to show that they had been affected by the sewer-water. An inspection made at Hamburg has resulted in an equally satisfactory manner.

* The limit of age fixed by the Board is between twenty-eight and fifty years.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

5,598. F. Greatrex, Uxbridge. Stoves and fireplaces. Nov. 24, 1882.

5,636. T. Carter, Bideford. Preventing the flow of sewer gas into buildings. Nov. 27, 1882.

5,680. H. Doulton, London. Construction of the steps of flights of stairs. Nov. 29, 1882.

5,685. F. Smith, London. Bricks. Nov. 29, 1882.

5,704. H. J. Allison, London. Artificial stone for veneers, &c. (Com. by W. Matt and M. Meterbach, New York, U.S.A.) Nov. 30, 1882.

5,708. P. Jensen, London. Manufacture of furniture, doors, window-sashes, &c., from peat moss. (Com. by T. P. Aktiebolag, Jönköping, Sweden.) Nov. 30, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named :—

Nov. 28, 1882.

3,487. E. Edwards, London. Apparatus for maintaining a constant draught in chimneys. (Com. by A. Marques, Bordeaux.) July 22, 1882.

4,850. W. Teague, Illogan. Apparatus for ventilating purposes. Oct. 12, 1882.

5,125. A. J. Boult, London. Door checks or governors. (Com. by the Elliott Pneumatic Door Check Company, Boston, U.S.A.) Oct. 27, 1882.

Dec. 1, 1882.

3,554. J. L. Thomasson, Worcester. Ventilators. July 26, 1882.

3,565. H. Morris, Manchester. Apparatus for adjusting ventilators. July 27, 1882.

3,613. A. C. Henderson, London. Stoves for heating by hot air and water. (Com. by Besson & Co, Paris.) July 31, 1882.

3,816. H. J. Haddan, London. Stoves. (Com. by D. McB. Graham, Massachusetts, U.S.A.) Aug. 10, 1882.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending December 2, 1882.

1,740. A. Browne, London. Stove. (Com. by L. Bregha, Dresden.) April 12, 1882. Price 6d.

This consists of three cylindrical chambers, one within the other. From the fire beneath, the gases of combustion rise into the innermost cylinder, thence pass down the inner annular space, and rise again through the outer annular space, whence they pass to the flue. The air is led through pipes through these spaces to be warmed.

1873. H. Fokes, London. Apparatus for sweeping chimneys and flues. April 19, 1882. Price 2d.

At the top of the chimney is a pulley, round which passes a chain, to which the brush for sweeping is attached. (*Pro. Pro.*)

1890. F. Kingston, London. Eye for holding stair-carpet and other rods. April 20, 1882. Price 4d.

This eye has two limbs, which terminate in chisel edges, by which the eye is secured in its place.

1,902. W. Selby, Manchester. Ash-guards. April 21, 1882. Price 4d.

These consist of a hinged perforated shelf, with ledges which form a toast-stand, a toaster, and a smoothing-iron heater.

1,916. T. A. Riggs, Aldeburgh. Combination of substances for the manufacture of bricks, &c. April 22, 1882. Price 4d.

The chief material is "coralline craig," which is mixed with cement or lime, and made into the required form.

1,974. John Henson, Derby. Barns and shelters with rising and falling roof. April 26, 1882. Price 8d.

The roofs are supported by chains led over pulleys on the top of uprights, and are raised or lowered by a worm and worm-wheel, which actuates all the chains at the same time.

1,975. T. E. Bladon, Birmingham. Ventilating and chimney cowls. April 26, 1882. Price 6d.

These consist of two concentric tubes, on the axis of which are two sets of vanes inclined in opposite directions. As the air enters it passes through one of these sets of vanes down the annular space between the tubes, while the vitiated air escapes through the inner tube past the other set of vanes.

1,979. J. Beresford, Birmingham. Urinals. April 26, 1882. Price 8d.

The basins are secured on horizontal pivots, so that they can be folded up, and a small tank is arranged above, so connected with the pivot that the water is shut off when the basin is lifted, and the tank is allowed to fill, and when the basin is lowered for use the water in the tank flushes the basin.

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

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2,006. W. Willshaw, Lenton. Ventilating greenhouses, &c. April 28, 1882. Price 2d.

The air-admitting orifices have pipes, which lead the air to a trough surrounding a portion of the heating-pipe, whence the air may pass into the greenhouse warmed. (*Pro. Pro.*)

2,022. J. H. Welch, Birmingham, and B. W. Spittle, Wednesbury. Attaching door-knobs to spindles. April 28, 1882. Price 2d.

A steel tongue is placed inside the mount of the knob, to bite the corner of the spindle. (*Pro. Pro.*)

2,216. T. C. Summers, Portsea. Supplying water to water-closets. May 11, 1882. Price 6d.

The seat is connected with a double-action closing piston. When the front end of the seat is depressed the tank is allowed to fill, the exit from the tank being cut off, and when it is again raised the flush issues from the tank, shutting off the supply.

4,039. W. R. Lake, London. Impregnating mineral substances or compounds with bituminous products. (Com. by R. Michelet and L. Tescher, Berlin.) Aug. 23, 1882. Price 6d.

The stones, bricks, &c., are subjected to the action of intense heat, vacuum, and pressure, in a receptacle to which the bituminous substances are introduced with which they are impregnated.

HARD GLASS.

One of the leading organs of the German glass trade has recently called attention to the fact that, under certain conditions, the description of glass known as hard glass is liable to fracture, and in some cases is even more easily destroyed than ordinary glass. Cases occur in which glass vessels composed of it break without apparent reason, the cause being probably that the process of cooling has been too rapid, or that it has been partial and unequal in its operation, with the result of some parts of the glass being of different elasticity from others.

The invention of De la Bastie (by which glass heated to a softening point was plunged into oil, grease, wax, resinous, or bituminous substances, and subjected to a rapid process of cooling until a certain degree of temperature was attained, from which point the process was conducted at a slower rate), attracted, at the time of its being made public, a degree of attention in excess of its merits as proved by actual experience. It is no detraction, however, from the approved and tried value of this process, to record that the expectations formed of its practical value were, in many cases, of an exaggerated nature. Thus it has been stated that its resisting power was fifty to eighty times that of ordinary glass. The fact is noted that sheets of hard glass can bear the strain of weights falling on them, and can also bear the shock of being thrown down from a height. At the same time, they are easily broken, it is stated, if in their fall they come upon a piece of gravel, which cracks the glass. When hard glass breaks, it usually does so with a certain degree of violence, and falls into a number of small, sharp-edged fragments. In this respect it is not dissimilar to certain kinds of Venetian glass.

The cutting of hard glass can usually only be effected in one manner, namely, in a parallel line to the sides, this circumstance being connected, it is said, with certain facts in relation to optical science.

ST. PETER'S CHURCH, LEICESTER.

The decoration of the chancel of this church is now completed, and presents a harmonious effect. The lower part of the apse is painted in a chocolate colour, with ornamental bands running across it, and the sacred Greek monograms A and O in gold; from the moulding at the top of this dado to the string-course running round the windows a greyish-green prevails, and is powdered with conventional lilies and roses, with a rich chocolate band of pomegranates at the upper part. The spandrils over the arches of the windows are filled with a conventional treatment of the vine in a brownish red, on a vellum-coloured ground, the grapes being in gold. There are also shapes containing sacred monograms on coloured grounds, and each window is surmounted by an ornate cross, the reveals being painted a warm salmon colour. The cornice running round the whole of the chancel is ornamented in gold and colours in broad leading lines. The wooden roof of the sacrarium is divided into sixteen large panels in two rows, each panel being filled with an angel clothed in white, with coloured wings and gold nimbi. The upper row are playing on musical instruments; the lower holding a scroll, with the text, "The Lord is in His Holy Temple, let the earth keep silence before Him." The two angels immediately over the altar are kneeling in adoration. At the apex where the ribs meet, the panels contain broad gold rays radiating downwards; the ribs are treated with chevrons of gold and red; some of the lesser mouldings are also coloured. The whole composition has been designed and executed by Messrs. Cox, Sons, Buckley, & Co., of Southampton-street, Strand, London, who are also painting the panels for the new reredos, which is being made by a townsman, Mr. Noble, after the designs of Mr. Turner, architect.

PROVINCIAL NEWS.

Reading.—The new block of buildings to be known as the "British Workman," in Abbey-street, Reading, was opened on the 23rd ult. The old premises, which were erected in 1872, were found to be not sufficiently large for the present requirements, the house being very largely patronised by working men and country people visiting Reading, and, by the liberality of Mr. Alfred Sutton, the new premises have been built at his sole cost. The old coffee-room has been transformed into a bar where tea, coffee, and other non-intoxicants will be sold, and adjacent is a spacious dining-room 36 ft. long and 18 ft. wide, fitted with marble-top tables and comfortable benches, and affording accommodation for about seventy persons at a time. On this floor also are scullery and kitchen, with all modern appliances, and in the latter room is a lift communicating with the first floor. The club-room, which is on the first-floor, will seat a large number of persons. In addition to the supply of refreshments, ample accommodation is provided for working men and others of limited means to lodge or live, there being on the first and top floors about twenty bed-rooms neatly furnished for single working men. In the basement of the building are spacious stores, larder, &c. The contractor was Mr. J. Bottrill, King's-road, and Messrs. Brown & Albury were the architects. On the occasion of the opening of the building Mr. Alfred Sutton invited the whole of the workmen employed in the construction of the building (numbering between seventy and eighty) to a substantial dinner. The total cost of the building has been about 3,000*l.*

Tunstall.—We learn from the *Staffordshire Advertiser* that the Tunstall Board of Health is endeavouring to retrieve the mistake it made many years ago in erecting a market wholly out of character with the needs of the town, and which has been a "white elephant" ever since. It is proposed to convert a third of the dismal waste into a structure which will supply the town with the public offices of which it is so much in want, and if the estimates of the surveyor are reliable, not only can this improvement be effected without adding to the rates, but the rearrangement of the market and the additional buildings will bring in a revenue which will go a good way towards paying the interest on the outlay. Captain Hildyard, R.E., has held an inquiry in reference to the matter, the Local Board having applied for a loan of 12,000*l.* for the purpose of effecting the improvement. Among the witnesses examined in support of the scheme was Mr. Wood, the surveyor to the Board, who explained his plans, and said that the present area of the market was 7,226 square yards, and the intended area would be 4,920 square yards. The present number of stalls was 130, besides 60 yards of tables. The altered market would contain 94 stalls, and tables of the length of 54 yards. The cost of re-arranging the market would be 1,450*l.* In the new erections (in front of the market) there would be a board-room, offices for the officers of the board and the relieving officer, and a committee-room. The inspector said he could not help thinking that Mr. Wood's estimate would be exceeded. Mr. Dutton said the Board had determined to keep within the 12,000*l.*, and if the tenders exceeded the estimate the plans would have to be amended.

Birmingham.—The Birmingham Council has been occupied in considering the draft of the new Birmingham Corporation Bill for consolidating and amending the various Acts and Parliamentary Orders affecting the powers of the Corporation. These powers relate to sanitary matters, the regulation and control of the parks, municipal buildings, free libraries, and other property of the Corporation, the by-laws affecting porters and drovers, hackney carriages, and marine-store dealers, the police regulations, the sale of coal, the duties of the fire-brigade, and the prevention of fires, the employment of children in factories and workshops, the conduct of the gas and water departments, the Closed Burial Grounds Act, and the finances of the borough, together with a number of miscellaneous regulations and provisions.

EDUCATION OF ENGINEERS.

Sir,—In your article in last week's *Builder* on "The Education of Engineers," you remark, "Shall the Institution of Civil Engineers remain an educating body when it becomes an examining body?" Those who favour the present movement are disposed to answer this question in the negative, and they suggest that the large number of students now under the *ægis* of the Institution should be transferred to one of the junior engineering societies."

This is not the view taken by the Council of the Society of Engineers, for they aim at strictly educational work in their coming lectures, which is a totally different thing from the work now done by the Institution with their students.

As a matter of fact, the Council carefully avoided appointing Tuesday and Friday evenings, so as in no way to clash with the ordinary meetings of the Institution on Tuesdays, or their students' meetings on Fridays.

Jabez Church, M.Inst.C.E.,
President, Soc. Eng.

DAMP WALLS.

Sir,—We have read with much interest the article in your last issue on this subject, reproduced from the *Badische Gewerbe Zeitung*. It is quite evident that Professor Meidinger has thoroughly investigated the matter as to the different causes from which damp walls are produced.

Of the remedies recommended by him that contained in paragraph *c* is undoubtedly the most effectual, but it is absolutely necessary that the walls, after being thoroughly dried by stoves, should be kept heated during the application of the waterproofing liquid, and also that it be driven into the bricks or stones with the heated stoves until they become thoroughly saturated. It will take from six to twelve applications of the liquid to do this, one coat being quite useless, as we have found from experience.

Tinfoil and pitch paper have been in use for some years, but in nearly all cases failed after the lapse of a few months, when the damp from the walls causes it to come away from them, bringing the paperhanging with it.

A. Dreyfus & Co.

REMOVAL OF SNOW.

Sir,—About ten weeks ago the Commissioners of Sewers invited sketches and ideas for the removal of snow from the area of the City. As one of the competitors, will you kindly allow me, through the medium of your columns, to ask these gentlemen what decision they have arrived at, and when that decision will be made known? Patience.

COSTS OF PAVING THOROUGHFARES.

At Marylebone, the owners of five houses at Dartmouth Park-hill were summoned by the Vestry of St. Pancras for their part of the estimated expenses of providing and laying the paving on the west side of that thoroughfare. Mr. Besley supported the summons, Mr. Rotton and Mr. Lyon defended. The boundary of the parishes of St. Pancras and Islington ran down the centre of the road, and, by an order of the Metropolitan Board of Works, the upper part of the thoroughfare was vested in Islington for paving and sewage works, and the lower end in St. Pancras. Islington had been unable to recover paving demands for houses on the western or St. Pancras side of the road, although it was a portion of the thoroughfare vested in Islington. St. Pancras parish then took these proceedings.

Mr. Cooke held that a vestry could not apportion on houses in one part only of a road, but must do it on both sides of the road. One parish also could not apportion on houses in another parish. There was here a perfectly good order vesting the whole of that portion of the street in the Islington vestry, and the demands made by St. Pancras were illegal, and could not be sustained. The summonses would be dismissed, with twenty-six guineas costs against the vestry.

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OBITUARY.

Miss Rhoda Garrett.—The death is announced of Miss Rhoda Garrett, at the age of forty-one. The daughter of a country clergyman of small means, and one of a large family, she broke through the usual restrictions of home life and determined to earn for herself an honest independence. After passing through an architect's office, she set up for herself as a "house decorator," taking a cousin, the sister of Mrs. Garrett Anderson and Mrs. Henry Fawcett, into partnership, and, in spite of delicate health, soon attained a good position. Her taste and sense of fitness soon recommended her to a large and admiring circle.

DISSENTING CHURCH-BUILDING NEWS.

Clapham. — The new Baptist Chapel in Grafton-square, Clapham, was opened on Tuesday, December 5. It has been erected of picked stock facings, with Portland stone dressings and red-brick quoins, &c. It will hold 850 persons seated in the area and capacious galleries. There are schoolrooms in rear to accommodate on first and second floors about 500 children. The usual vestries and other offices are provided on the ground-floor. The amount of the contract was 5,572*l.*, exclusive of heating, which is on Grundy's hot-air principle, and appears to act well. The architect is Mr. W. Niven, Dean's-yard, Westminster, Mr. F. Higgs, of Loughborough Junction, being the builder, and Mr. C. Hunt, the foreman of works.

Richmond, Yorks. — A new Congregational church is to be built at Richmond, Yorkshire, from designs by Messrs. Clark & Moscrop, architects, Feethams, Darlington.

STAINED GLASS.

Salisbury.—Wilton Church has just received an addition in the shape of a memorial stained-glass window, the gift of Dr. Bennett, a local physician, to the memory of his wife. In the treatment of the window the greatest importance has been given to the central subject, illustrating the "Resurrection," which was, at the request of the donor, treated after a painting by Giotto. Surrounding this is a subject showing the three Marys at the tomb. The subject chosen to form the base of the window is "Our Saviour meeting Mary 'on the third day' in the Garden." These subjects are divided by a frame-work of grisaille ornament. The window has been executed by Messrs. J. A. Gibbs & Howard, Charlotte-street, Fitzroy-square.

Chewton Mendip.—Two stained-glass windows, as memorials to the late Mr. E. B. Hippisley and members of his family, have been recently placed on the south side of Chewton Mendip Church. The designs consist of canopy work in accordance with the architecture of the stonework, and in the panels are the following subjects, illustrating the parables of our Lord:—"The Unmerciful Servant," "The Labourers in the Vineyard," "The Talents," "The Good Samaritan," "The Lost Sheep," and "The Prodigal Son." In the tracery are angels bearing inscribed scrolls. The work has been designed and carried out by Messrs. Joseph Bell & Sons, of College-green.

Piddinghoe.—Several of the windows of the recently-restored parish church of Piddinghoe, Sussex, have been filled with stained glass, the gift of parishioners and friends. The three lancets at the east end of the chancel represent in the centre the Crucifixion, with St. Mary and St. John on either side. These windows are the gift of Mr. R. H. Faulconer, of Lewes, and were executed by Messrs. Powell, Whitefriars, London. All the other windows are by Messrs. Wailes & Strang, of Newcastle-on-Tyne. The windows in the baptistery represent Christ blessing little children, and his own baptism. The windows of the south aisle are occupied by representations of the twelve Apostles, and one in the north aisle represents the Eastern Kings bringing offerings to the Saviour, which is in memory of Mr. Hugh, who died in 1866. Another shows Simon blessing the infant Saviour, and is to the memory of Mr. Winton Croft, who died in 1862. The third window in this aisle is to the memory of James and William Tompsett, and in the north aisle in the chancel is a stained window to the memory of William Purnell, who died in 1879. The east window of the north aisle represents the "Ascension," and is erected to the memory of "Joseph and Mary Tompsett." One of the windows in the south aisle portrays the Resurrection, and has been put in as a memorial of Francis Tompsett.

SCHOOL-BUILDING NEWS.

Lynn, Norfolk.—The foundation-stone for the new Wesleyan schools has been laid. When completed, the schools will consist of entrance-hall, on either side of which are two large schoolrooms, communicating with the lecture-hall, 60 ft. by 40 ft., and 25 ft. high, adjoining which are six class-rooms and the library; there will be also a retiring-room, with lavatory and water-closets. The kitchens and other offices are detached. The buildings are designed in the Perpendicular style, with Bracknell red facing-bricks for the front, and Lascelles's concrete dressings to the windows and doors; the roof will be covered with slates. Mr. W. H. Brown, of Lynn, is the contractor, Mr. Hillam being the clerk of the works. Mr. Hatchard Smith, 41, Moorgate Station-buildings, is the architect.

Miscellanea.

Conviction for Abusive Language to a Local Board Official.—Before the Stipendiary, Mr. J. R. Phillips, West Ham, William Simpson, described as a builder, of Graydon-villa, Forest-gate, appeared in answer to a summons charging him with using abusive and insulting language towards Edmund Henry Raiman, on the 20th of November. After hearing the witnesses for the defence, his Worship said that it was impossible for him to come to any other conclusion than that the case was made out against him. It was perfectly clear that Mr. Simpson not only did use the language imputed to him to Mr. Raiman himself, but also to a strange boy. He could not understand how a person of the defendant's apparent education and status could so demean and disgrace himself in that way. He would have to pay a fine of 2*l.* and costs, in all 3*l.* 11s.

Presentation.—Mr. Reuben Cull, London representative to Messrs. John Knowles & Co., of Euston-road and Burton-on-Trent, having decided to retire from that position, the staff and workmen met and entertained him at the Wrotham Arms, Camden Town, a few days ago, and amid unanimous expressions of respect and sincere regret at his resignation, presented him with a liqueur-case, suitably inscribed. Messrs. Knowles & Co. have issued a circular to their customers, in which they point out that Mr. Cull's retirement is his own decision, after having filled his position faithfully and honourably for twenty years. Mr. Cull retires to the Ketley Blue Brick Works, in which he is a partner, and in his new sphere of action we wish him all prosperity.

Architectural Exhibition, Edinburgh.—Particulars of this exhibition were given by us a fortnight ago. Works intended for exhibition will be received at the Royal Academy National Galleries on Wednesday and Thursday next, Dec. 13 and 14. All communications connected with the exhibition to be addressed to Mr. Alfred Bryson, acting secretary, 39, Frederick-street, Edinburgh.

Mr. and Mrs. German Reed's Entertainment.—On Wednesday next, December 13, Messrs. Reed & Grain will produce their Christmas programme, comprising a new first piece, by Arthur Law, music by King Hall, entitled "A Strange Host; or, a Happy New Year"; and a new second piece, by Gilbert A'Beckett, music by Corney Grain, entitled "That Dreadful Boy." Mr. Corney Grain's musical sketch "En Route," will still be retained in the programme.

Burgos Cathedral.—We are asked to mention, with reference to the recent competition here, that the firm who has been selected by the Royal Academy of Madrid to provide stained glass for the six large windows in the chancel is Messrs. Mayer & Co., of Munich and London.

Leatherhead Drainage.—Eighteen sets of plans were sent in for this work in reply to the advertisement of the Rural Sanitary Authority of Epsom Union. The first premium has been awarded to Messrs. Gotto & Beesley, of Westminster. The plans were referred to Mr. Baldwin Latham, C.E.

The Strength of Boiler Flues.—At a meeting of the Society of Engineers, held on Monday, December 4th, in the Society's Hall, Victoria-street, Westminster, Mr. Jabez Church, president, in the chair, a paper was read by Mr. W. Martin on the "Strength of Boiler Flues." In the construction of steam boilers, more than in ordinary engineering matters, it is of special importance, both to the engineer and the public, that the principles involved should be clearly established, since cases of failure produce such disastrous results, which, now that steam power is so universally used, may affect the safety of the public at large. In most cases, where a boiler fails simply from inherent weakness, it is usually from the collapse of its flue, since the flue of a Cornish or Lancashire boiler is, unless specially strengthened, the weakest part of the boiler. Besides being essentially weaker, the flue is the part which, more than any other, is injuriously affected by faulty construction. This, in conjunction with the consideration that, unless dangerous or almost collapsing pressures are applied, it is extremely difficult to discover their weakness by testing, makes the construction of boiler flues a matter of particular importance. Notwithstanding the interesting character of the problem, and its importance, however, the experimental data upon which our knowledge rests is insufficient and unsatisfactory. The only systematic series of experiments which have been made at all were made by Sir William Fairbairn twenty-four years ago, and the formula deduced by him from these experiments is still the one in use by engineers. The reliability of this formula is not, however, beyond question, and its application to different cases can be made to produce somewhat anomalous results. It is much to be desired that this subject could receive a new experimental investigation, and in such a case, the experiment should be with objects corresponding in shape, and conditions of strain, though not necessarily in size, to actual flues.

Railway Hotel, Liverpool.—The Lancashire and Yorkshire Railway Company have instructed Mr. Henry Shelmerdine, of Liverpool, to carry out their intended hotel and station buildings at the new terminus, Tithebarn-street, Liverpool, which are estimated to cost upwards of 100,000*l.* He has lately carried out several extensive erections, including new *Daily Post* offices, Imperial Chambers, Henstock's Buildings, Castle-street, and several buildings in other parts of that city.

Portishead Railway.—Arrangements have been made for doubling a portion of the Portishead Railway, between the junction with the main line and Clifton Bridge Station. The tender by Messrs. J. Durnford & Son, contractors, has been accepted. Mr. F. C. Stileman, of Westminster, is the engineer.

The Courts of Justice.—The *Citizen* has issued a large and clear plan of the principal floor of the Royal Courts of Justice. It will be found useful to hang up in offices.

TENDERS

For the erection of school-rooms, class-rooms, and gallery, and reseating of ground floor, at the Baptist Chapel, Queen-street, Ilkeston, Derbyshire. Mr. R. Argile, architect, Ripley and Derby. Quantities supplied:—

Noon & Wood, Marston	£1,250 0 0
Holbrook, Ilkeston	1,172 0 0
Ford & Co., Derby	1,120 0 0
Shaw, Ilkeston	1,115 0 0
Clark, Ripley*	1,000 0 0

* Accepted, subject to modifications.

Accepted, for pulling down and re-erecting three houses at Charlestown, Halifax, for Mr. Thos. Townsend. Messrs Leeming & Leeming, architects, Halifax:—
Fearnley & Firth (mason).
W. Macdonald (joiner).
A. S. Blackburn (plasterer and slater).
Akroyd & Mills (plumbers & glaziers).

Accepted, for tailors' workshops and woolshops, Halifax, for Mr. Jubal Riley. Messrs. Leeming & Leeming, architects:—
Scott & Co. (masons).
Noble & Son (joiners).
A. Hobson (plasterer and slater).
J. Thompson (plumber and glazier).

For works in connexion with building new infants' school, boundary-walls, &c., at Upper Stratton, Swindon, for the Stratton St. Margaret School Board. Mr. William Drew, architect, Swindon:—

Wallis	£738 0 0
Barrett	679 0 0
Henley	659 15 0
Wiltshire	659 12 0
Jackson	649 0 0
Phillips & Powell	648 10 0
Looker (accepted)	625 0 0

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For additional block of buildings, receiving wards, &c., at the workhouse, Sydney-road, Homerton, for the Guardians of the Hackney Union. Messrs. Lee & Smith, architects:—

Stevens & Baker	£37,750	0	0
Hart	37,286	0	0
Gentry	36,974	0	0
Paramor, Margate	36,785	0	0
Howell & Son	36,550	0	0
Morter	36,475	0	0
Crockett	36,398	0	0
Johnson	36,347	0	0
Boyce	35,700	0	0
Longley	35,541	0	0
Perry & Co.	35,280	0	0
Kellett & Bentley	35,184	0	0
Nightingale	35,180	0	0
Macgregor	35,115	0	0
Ewins & Co.	33,900	0	0
Wood, Chelmsford	33,720	0	0
Croaker	33,411	0	0
Merritt & Ashby	33,111	0	0
W. Shurmur (accepted)	32,877	0	0
Capsey	32,532	0	0

For town-hall and cellarage, Eastbourne. Mr. E. F. W. C. Schmidt, architect (building surveyor), Eastbourne:—

Huggett & Coster	£17,390	0	0
E. Cornwell	17,180	0	0
Redford & Potter	16,946	0	0
W. Hook	16,280	0	0
C. Tomkinson	15,637	0	0
James Harper	15,540	0	0
James Longley	15,495	0	0
James Peerless	15,410	0	0
William Jones	15,370	0	0
R. Climpson	15,200	0	0
J. A. Skinner	15,122	0	0
W. Gregar	15,118	0	0
Booth & Sons	15,000	0	0
Smith & Son	14,814	0	0
M. Wells & Co.	14,800	0	0
Priestley & Gurney	14,790	0	0
Deacon & Co.	14,774	0	0
Alfred Dore (accepted)	14,481	16	0
P. Peters	14,476	0	0
Grimwood & Sons	14,444	0	0
A. Matthews	13,676	4	4

For extension of the Adelaide Café, 436, Strand, and 11, King-street. Mr. Spencer Chadwick, architect:—

Lawrence	£6,850	0	0
Bywaters	6,475	0	0
Clements	6,345	0	0
Oliver	6,235	0	0
Howard & Dorrell	6,197	0	0
Garrard	6,121	0	0
Patrick	5,925	0	0
Langmead & Way (accepted)	5,690	0	0

For the New Dock Inn, Rotherhithe, for Messrs. Mann & Crossmann. Mr. Augustus Walton, architect:—

Burgen	£697	0	0
Sharing & Williams	682	0	0
Brightmore	647	0	0
Cook	613	0	0
Buller	598	0	0
Wood	590	0	0
Taylor	563	0	0
Hoben & Parker	550	0	0
Parrish & Hawker	540	0	0
Croaker	530	0	0
Aldridge & Gill	502	10	0
Cawson & Son	487	0	0
Hawkins	432	0	0

For the erection of new Sunday schools for All Saints' district, Leyton, Essex. Mr. Richard Creed, architect:—

Hunt	£2,045	0	0
Arber	1,997	0	0
Brightwell	1,893	0	0
Jones	1,890	0	0
Morter	1,858	0	0
Reed	1,764	0	0
Stewart	1,748	0	0
Bangs & Co.	1,740	0	0
North Bros.	1,725	0	0
Sayer (accepted)	1,549	0	0

For the erection of West Cliff Hall, Hythe, near Southampton, for Mr. John Wylie. Mr. W. H. Mitchell architect, Southampton:—

W. J. Martell, Hythe (accepted) ... £6,162 0 0

For the erection of a temporary church, Shieldfield, Newcastle. Mr. Arthur B. Plummer, architect, Newcastle-on-Tyne:—

Walter Baston (accepted)

For the erection of nine houses in Rose-road, Beddington, Surrey. Mr. C. W. Reeves, architect, 102, Guildford-street W.C.:—

Howe & White (accepted) £2,400 0 0

For making new road, on Isaac Duckett's Charity estate, Crayford, Kent. Mr. C. W. Reeves, surveyor:—

Manners (accepted) £285 0 0

For rebuilding No. 4, Half Moon-street, for Mr. P. De Long. Mr. D. Cubitt Nicholls, architect:—

Langmead & Way (accepted).

For new lodge, and alterations to billiard-room, at Kenton Grange, near Harrow, for Mr. John Gwynne. Messrs. Dunk & Geden, architects:—

Various Contractors £800 0 0

For the partial rebuilding of chemical works at Langbourne Wharf, West Ferry-road, Millwall, for Messrs. Couper, McCarnie, & Co. Messrs. Dunk & Geden, architects:—

J. Rider Hunt £1,910 0 0

For plant-houses, potting-shed, &c., at Broomfields, Elland, for Mr. Godfrey Beaumont:—

S. Leeley (accepted) £320 0 0

For alterations to premises, Broadway, Hammersmith, for Mr. H. Newman. Mr. R. P. Whellock, architect:—

J. Mears (accepted).

TO CORRESPONDENTS.

L. & L. (should send amounts).—D. (illustrations of the Church of the "Sacré Cœur" have appeared in our pages).—R. & A. (send view, &c.).—L. J. B. (we cannot find space for testimonials).—J. R. L. B. (already inserted).—F. B. P. (we are not disposed to enter into the inquiry as to where Hopton Wood stone has been used).—H. B. (send particulars of trial).—W. P. B. (adds no fact to the discussion).—J. P. S.—R. P. W.—H. & O.—J. C.—H de B. H.—S.—G. T. C.—J. S. M.—R. T.—H. R. G.—H. & F.—C. & F.—M. & Co.—F. & Son.—G. S. & Co.—J. W. S.—W. D.—A. & H.—G. & B.—L. & W.—B. R.—S. Bros.—R. W. D.—C. W. O.—R. J.—E. W. S.—W. S.—C. & M.—G. L.—H. H. B.—R. K.—J. F. jun.

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The Builder.

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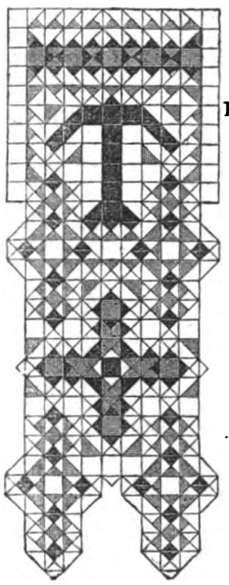

More Books on Decoration.

THE cry is still, "They come!" If we do not become a truly tasteful and decorative generation, it will not, at least, be for want of books to teach us the way in which we should walk; and the fact that publishers should be willing or able to produce so many books of the kind, and that so many persons think it worth while to write them, certainly argues a considerable degree of public interest in the subject.

The three books* at present before us illustrate three different classes of artistic publication. The lectures by the late (we regret to say) Miss Crane attempt to deal suggestively with the whole subject of art,—what it is and how it arises,—an immense subject, of course; but there is nothing pretentious about Miss Crane's lectures; she does not profess to give any exhaustive treatment of her subject, but to throw lights upon it and awaken thought in those who have not thought enough about it. Mr. Day's book is narrowed to one branch of art,—that in which he has been so successful himself,—and goes proportionately more into detail in regard both to principles and practice. Mr. James's book (we will conclude the author to be "Mr.," in the absence of any evidence to the contrary on the title-page) belongs to a much less important and more humble class of works, those which are intended to furnish "hints to beginners" who wish to amuse themselves by trying a little amateur decoration; it has, in fact, no claim to be grouped with the other two except for the sake of convenience, and we may dispose of the few remarks we have to make about it at once. The author gives instructions for the preparation of such means of applying colour in rooms as are likely to be within the reach of amateurs of average resources, and also a few particulars as to the nature and prices of some of the most useful of the available methods of hanging or covering walls. As far as they go, these are practical and useful; after this, the author concludes that "it will not be out of place to say a few words on the various styles of decoration." Considering (and not without some reason) that to most people of average culture their very culture almost precludes originality, and leads them to some sort of copying from the forms of other periods with which they are acquainted, therefore he says a few words as to the characteristics of various styles, and gives some few illustrations of their prevalent forms, which illustrations are mostly not good. Some attempt is made to define decorative art, but not very clearly; for instance, we are told flat and conventional design is much better suited to wall decoration than natural painting, but no reason or explanation of this judgment is given. A suggestion, that the Ogham alphabet may be used in inscriptions with decorative effect, has the merit of originality, but it hardly seems worth while to adopt an extinct character with which very few people are acquainted for the sake of the limited and somewhat barbaric decorative effect to be obtained from it. In short, Mr. James had better have published the first or practical half of the work as a pamphlet; the suggestions contained would have been useful in that form.

The two other books we speak of stand on higher ground, and they deal respectively with the two leading questions about decorative art; first, what is it, why do we want it, how did it arise; all which are varying forms of the *why* which crops up in relation to all branches of art; and secondly, what is the best we can do with it now, how should we apply it, in what direction are our efforts to be made. *Why* and *how*, in short; those words sum up roughly what we want to settle about it.

Miss Crane commences her introductory chapter with a much-needed protest against the jargon use of the word art—"art-embroidery, art-colours," &c.; a piece of patter which meets us in Mr. James's book, by the way, where we come across the threadbare talk about "æsthetic colours." Expressions of this kind were, as Miss Crane says truly, "invented by shopkeepers to characterise a kind of goods got up in a certain style to please that part of the public that cares for fashion and novelty alone, and has no higher aims and desires, and wishes to have none." Miss Crane's definition of art follows a line which some other writers have followed lately,—that art is only workmanship, carried to a higher point. There is a great deal that is suggestive in this view of the matter; it is the partial expression of one side of decorative art, that it should have relation to the form or use of the object decorated; but it is a confusion of ideas after all, arising from the use of one word in a double sense. She says, "the word, in its original sense, meant force or strength, and it was applied to mechanical work, and is so still.', It is not applied in the sense of force or strength, however, but of skill. But when we talk of the art of weaving, for instance, and of the art or artistic feeling displayed in a design with which the stuff woven is decorated, we mean two different classes of human work and ability. The art of weaving, in the first sense, implies only mechanical dexterity applied to a material intended for practical use. The art of the artist, in designing a pattern to be worked on the stuff, is a talent differing not in degree but in kind; it depends upon perfectly different qualifications from that of the weaver, and it is applied to a totally different end. It is absurd to group them in this way, as:—

"1. Art purely necessary and useful;
2. Art decorative;
3. Fine art;"

which is what we find done here. It is a fallacy arising from the fact that the word "art," like a good many other words in our language, has come to be loosely used with two different meanings, and people are building erroneous definitions on that fact. It sounds very practical, but it is a fallacy. As soon as the maker of a thing for practical use comes to think of something else besides its practical fitness for its purpose, to do something to it or add something to it merely because this will improve its appearance, he is coming on a different task altogether, and calling into exercise a different class of faculties. It is true that a merely well-made thing, in the highest degree fitted for its use, will often please our artistic sense by its appearance of fitness, much more so than a more ornate article illustrated with bad or common-place decoration. It is also true that some every-day articles are now constantly made with a more or less degree of ornamental treatment, even in their commonest forms, which has come to be regarded by many, from habit, as almost necessarily associated with them, and as part of their practical treatment. But those considerations do not alter the fact that ornamental art is quite a different thing in its nature from practical or handicraft art, and that the two cannot be confounded together.

This admission is, in fact, necessary to justify the position taken by both the writers whose opinions we are noticing, that the judgment in regard to what is right or wrong in decoration needs cultivating just as much as the judgment in regard to other specialties. Mr. Day boldly puts on his title-page (and we are very glad to see it) a contradiction of a well-known and continually abused proverb: he says emphatically, "De gustibus EST disputandum," and he is quite right. Miss Crane brings out the same rule with equal emphasis: "In all other human productions, an enlightened or reasonable person sees at once that it is not enough to know what he likes, but what is *worth liking*; but, respecting questions of art, he thinks himself *born* com-

* "Art, and the Formation of Taste": Six Lectures, by Lucy Crane. With illustrations drawn by Thomas and Walter Crane. London: Macmillan & Co. 1882.

"Every-day Art: Short Essays on the Arts not Fine." By Lewis Foreman Day. Numerous illustrations, chiefly by the Author. London: B. T. Batsford. 1882.

"How to Decorate our Ceilings, Walls, and Floors." By M. E. James. With diagrams and coloured illustrations from designs by the Author. London: G. Bell & Sons. 1883.

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petent to judge, no matter though he never gave an hour's patient consideration to the subject." Mr. Day has a good many observations to the same purport in his chapter on taste. "Why is it," he asks, "that in this matter of art a man, even while admitting that he knows nothing of the subject, will protest that he is none the less competent to give judgment?" It is exactly because artistic work stands on a ground of its own, different from that of any other work, that these questions have their point. Miss Crane insists also a little too strongly on the idea, in which she fortifies herself by quotation from Mr. Morris, that "nothing is truly ornamental which is not useful." That is not quite the correct way of putting it; what should rather be said is that nothing can rightly take place as decoration except what is applied to some object in itself useful. Design which exists for itself alone belongs to the category of the fine arts, and must be the representation of life of some kind, human, animal, or vegetable, or landscape generally, with that degree of completeness which will give it a life and expression of its own, too high and too complicated to be relegated to the mere office of decorating an object. That which is rightly called "ornament" is art of that degree of interest that it will add beauty or expression to some object to which it is applied, but has not a special expression which would make it an object of sufficient interest in itself. We decorate an object with a Greek fret or honeysuckle ornament; but we should not hang up drawings of these decorations for their own sake, except in an art-museum or a studio. The simple object illustrated in the tail-piece at the close of Miss Crane's first chapter is an example of this. It is an antique pitcher of the simplest form, and is in itself a practical object merely, and its form, though agreeable, is so as representing a good practical shape. But the simple ornament of rings of beading round it at the top and bottom, has nothing to do with its utility; its application is a matter of taste merely. Ornament begins where utility leaves off, but it is an addition made to useful objects to give them an interest beyond mere usefulness. The moving cause of the existence of all artistic design, we should say, was creative impulse; the desire to make or create something; as Carlyle says in the passage Miss Crane quotes, "the first spiritual want of a barbarous man is decoration." The difference between art created purely for its own sake, which is what we call "fine art," and art created for a decorative purpose, is that in the former case the art is its own excuse, it appeals to us by its own intrinsic interest; in the latter case it has reference to the shape and use of the object to which it is applied, and must not clash with either. In so far it is connected with utility; but its *raison d'être* is not utilitarian, any more than that of painting and sculpture in the higher sense.

It is this relation of the decoration to the purpose of the object which is so little understood and borne in mind, and which causes so many stumbling-blocks to those who will not take the trouble of thinking about the subject, or see the necessity of doing so if they are to avoid sins against true taste. It is this want of thought which leads to the making of and the admiration for those hosts of things in absurd imitation of other objects,—earrings like boots, toast-racks with crossed muskets as bars, and so on *ad infinitum*. People will not, or cannot, see that such productions, however cleverly manipulated, have no relation whatever to the use of the objects to which they are applied, and are therefore vulgar because unsuitable and unmeaning; besides showing an utter want of that thought in design which gives the real value to all good ornament. The production of this kind of vulgarity is tradesmen's work; the desire of the tradesman to produce something "novel," and therefore saleable, being encouraged and called out by the lamentable fact that such a large proportion of persons will purchase anything in the shape of ornament if they find that it is the fashion for the time and is purchased by others. The influence of the tradesman's spirit is probably the most deleterious of all the influences at present adverse to the production of good art; and probably there would be a much more favourable chance if we could deal more with the men who actually made the things, and less with the middleman behind the counter. This influence, as Miss Crane complains, is peculiarly prevalent in London. "It is often possible to deal directly with the workman, particularly about country neighbourhoods, in such things as carpenter's work, for instance. In London it is hardly ever possible to get at the working carpenter, the working jeweller, the working dressmaker; there is always some very smiling and obliging shopman or shopwoman between us and the worker, whom I for one," says Miss Crane, "most want to see." Very few people, however, share this wish; they take "whatsoever is sold in the shambles," and make a false application of the apostolic precept, "asking no questions for conscience sake." And there is, we hope, some ground for the opinion expressed on another page,—that many of the workers would not for themselves delight to make such senseless things, "useless tawdry bits of glass, china, and metal work, vases that will hold nothing, candlesticks that will not carry candles," and so on; so that one may share in the author's reflection as to "the misery and grinding poverty that alone could drive intelligent human creatures to get their living by making them." Many will have had occasion to notice the interest and pleasure with which an intelligent workman will meet half-way any one who has an original idea as to how he wishes a thing made, and shows that he really cares about it on grounds of personal taste. It is the further cultivation of this personal taste (when an uneducated one), the desire to have things in your house because you yourself care for them, not because your neighbour has them, which is one of the feelings the cultivation of which is most desirable, as both our authors observe in different words. But so ingrained is the tendency of modern society to run in flocks in these matters, that we now actually have opposition tradesmen professing good taste as a speciality, and people ready in turn to take whatever they are told is right from these marts, without any more exercising their own judgment than before. Even Miss Crane has her own little bit of artistic fetichism too, and tells us that we in the present day know all we know of art from Mr. Morris and Mr. Ruskin, who "are qualified to tell us what the arts really are, and how to think and feel about them." They are highly respectable fetiches, no doubt, but we cannot quite bow the knee in undiscriminating acquiescence even to these idols.

It is one of the little results of this worship, we presume, that we meet with the statement that cut glass cannot be in any sense an artistic treatment of the material, because glass is a light, fragile material, "capable of being tinted, blown, and moulded into a multitude of delicate forms." It is capable of all this, and these are its most beautiful capabilities; it is also capable, in heavier forms, of being cut with very brilliant and rich effect. Glass-cutting has been so often vulgarly treated that it is no wonder, perhaps, there should be a prejudice against it; but to condemn it *in toto* is absurd. It is certainly amusing, too, to find Miss Crane quoting "Mr. Ruskin's definitions" of Greek, Romanesque, and Gothic styles as "the architecture of the *lintel*, of the *rounded arch and cupola*, and of the *pointed arch*." Did Miss Crane, and do her readers, really suppose that Mr. Ruskin alone invented or was able to invent that simple classification? There is, however, much that is sensible, and thoughtful in her pages, and we felt grateful to her memory for nothing more than for her recognition of that wonderful Titian in the National Gallery as "the ideal painting, as the Venus of Melos is the ideal sculpture," and the wish that she could enable any one who had not yet appreciated it to feel, once for all, what the art of painting at its best can do. "Once feel this, and you know more than all the treatises, criticisms, and lectures on art in the world can teach you." And yet how utterly hopeless it seems to attempt to explain, to any one who has not the perception of it, in what the glory of that wondrous painting consists.

Mr. Day's book goes into more subjects in reference to decoration than we have space to follow here. He has written it, he says, because he had something to say about his art, not because he had to say something. A good deal of it, in regard to general questions of taste, has been said before in various forms and by various writers, in our columns as well as in books. We notice one observation among others which should be emphasised; that, in one sense, too much is left to a decorator, too much expected of him. People who apply to him "have formed no notion what they want in the way of decoration. They should have something more than a notion." This is almost equally the case in regard to architecture, the artistic part of it at least. In each case the employer in reality requires the architect or decorator to tell him what he wants. He possibly has some vague idea in his own mind, but he cannot define or express it. In this very common case it is certainly unfair that the artist should be blamed afterwards for not having satisfied him. But the decorator, Mr. Day says, should make it his object in such cases to find out as much as possible of the individual tastes and likings of his employer, and endeavour to show him, what he does not know himself, the best way of satisfying these. This is a much more sensible and reasonable view than that which is acted upon by some decorative artists, who will not scruple to tell their employer that he must leave it to them to do what they think fit; a verdict against which many men would rebel, quite excusably, from a mere spirit of independence and dislike to be ridden, quite apart from artistic considerations. The main point in Mr. Day's book, however, which can be laid hold of as distinctive, is his idea as to the present path of decorative art. This he suggests to be the laying hold of types and principles in former styles, and forming new combinations and new starting points from these. This he has endeavoured specially to illustrate in some cases. One of the best suggestions in this way is that in treating a particular natural form ornamentally we should compare it with its treatment in different materials in the art of different schools. Thus he gives, in regard to the rose, illustrations of Tudor, Persian, and Japanese treatment; the first an adaptation of the Tudor rose, by himself, for stained glass ornament. This is a very good hint, capable of very extensive and varied application. Another point of the highest importance, and often forgotten, which is touched upon, is that all decoration should have some definite intention pervading it, which should be remembered and carried out through every detail. "Whether the motive be unpretending or ambitious, every stroke should lead up to it. Every stroke that does not do so is ill done. The first step in design should be to determine what shall be the culminating point of the decoration; and, however lavishly the artist may distribute enrichment, he reserves for this his crowning effort, making all else converge towards it. Without such emphasis of treatment ornament sinks to the level of a dead monotony." This, to any one who regards decoration as an object of serious thought, is really almost a truism, but one which is sadly neglected.

We are not able, however, to follow Mr. Day with entire sympathy as to the question of realistic and conventional, as illustrated in the examples scattered throughout his book. These are in many cases charming, but there seems a want of a fixed opinion or guiding rule as to the treatment of natural forms. We find on one page a highly conventionalised ornament, on another a nearly natural spray treated as inlay or otherwise. Some of the latter appear to us to come more near the domain of flower-painting than of ornament, and as at the same time they are not highly finished enough from that point of view, they give some colour to the charge brought by a painter, whose name is not given, against conventionalised nature, as merely a "stopping short" of faithful representation. Of course conventionalism is really the application of thought to the evolving of a design out of a natural form; and the charge of "stopping short" is absurd as applied to such design; but we are not sure that some of these would not give excuse for it. The treatment of seaweed as ornament (page 46) we could not accept as "ornament" in the true sense; it consists of nearly naturalistic sprays arranged conventionally and symmetrically, or nearly so. A Japanese artist would have kept the natural detail and distributed it at random (or seemingly so) over the panel; a Greek artist would have evolved a perfectly conventional representation, conventionally arranged, out of it. But the example given here is neither the one thing nor the other. The illustration of the "frank acceptance of the lead-lines" in window glazing (p. 130) is what we should call frankly refusing to accept them. A floral design is drawn right through them, and the effect is not good. The "acceptance" of them would rather be the division of the design into squares varying in each pane. On the other hand, the design for door decoration (p. 168) is

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admirable, both in theory and fact, entirely based on the construction, and an instructive contrast to the fashionable way of painting flowers scrawling from one panel to another, irrespective of construction. We mention this the rather in that we have seen one of these straggling door designs in another book by Mr. Day, and hope that he has repented of this sin. There is a great deal that is worth attention in the book in every way, and it is both well written and beautifully illustrated.

ON THE MAKING OF STATUES IN PLASTER.

IT is not in respect to the use of plaster of Paris in making moulds from statues and casts from them that the following remarks are offered, but in regard chiefly to the preparing of statuettes and statues in the first instance in plaster, that they are submitted.

Clay, in a moist state, from the readiness with which it lends itself to be fashioned into form by being added to and taken from, is suitably, almost universally, in use for the above purpose; and that this was also the practice in the earliest times of art is attested by the very many ancient terra cottas and sketches in terra cotta extant, and by the various well-known records and anecdotes relating to the subject. Plaster also, by the name of gypsum, is mentioned by Pliny as having been early in use by the artists of olden times in the production of sculpture. This material is a sulphate of lime which, having been burned to a powder, mixes readily with water to the consistence of cream, and in a few minutes sets and hardens into a firm and solid substance, whence its ready convenience and great value in the formative arts. In modern days very extensive stores of this gypsum have been discovered at Montmartre, at Paris; it has, after its due preparation, received the name of plaster of Paris; in Italy it is called *gesso*. In England it goes by the name of plaster of Paris, although manufactured from the native mineral of our own land. No examples of it, however, are quite so good, perhaps, for the finest art purposes as that of Paris, which is especially even in its working and texture, which affords great facility for the production of the small decorative works of sculpture in which that art-loving metropolis delights and abounds.

It may not, therefore, be out of place to mention the extensive and special use made of it by the late M. Pradier, who may claim the title of having been the Anacreon of French sculpture, so full are his numerous works, especially his smaller pieces, of the erotic poetry which characterised the odes of the Teian bard; not, however, that they are quite Greek, inasmuch as they all partake somewhat freely of the flavour of Parisian fancy. At all events, they will ever hold a distinguished place among the works and history of French, and, it may be added, of European, Art. On good authority, derived directly from acquaintance with the practice of this sculptor, we have been informed that he was not so much in the habit of modelling his small works and statuettes in clay as of fashioning them from the first in plaster. For this purpose, in order to facilitate his progress, he was accustomed to have a number of little heads, trunks, and limbs of the required scale, all ready prepared for him in the plaster, in a disjointed and separate state, which, when a design occurred to him, he would arrange, and dispose, and have put together with fresh plaster in such attitudes and compositions as he fancied and contemplated. As this mode is unusual, and not much accredited in this country, this example of its employment may attract and deserve some attention as affording a precedent for a mode of procedure in sculpture which otherwise might be thought heterodox.

In this case this course was evidently the more facile from the excellence of the plaster at hand; for it would only be the best kind that would lend itself readily to the much piecing together of parts which the above process of making a statuette would involve. M. Pradier had also beside him skilled assistants fully familiar with the character of the material, and the due methods of mixing it, and making the fresh plaster adhere homogeneously to the old, and the even working of the two together. In addition to this, the great number of statuettes thus produced by this master and his assistants gave them a command of the material, such as might appear unattainable by those who have not similar opportunities of practice in the same excellent plaster.

Another instance of the execution of sculpture in this substance is to be found in the practice of the late eminent American sculptor, Mr. Hiram Powers, who was, for the most part of his art life, resident in Florence. His marble statue of the Greek slave attracted much attention in the first Great International Exhibition of 1851, and has not decreased in interest since. We have been informed that the original model from which this noted statue was pointed and wrought, was produced and worked almost wholly in plaster. Possibly there might have been a rough general mass in the first instance got up in clay, from which a mould was made, and a plaster-cast obtained out of this, to furnish a general form of material to begin upon. In such case, however, this was but for the convenience of readily arriving at what was but an inception and embryo stage of the work. But it is understood, in respect to all the completion of the statue, as a work of fine art, that this was the result of the sculptor fashioning and completing it, not in clay, but in plaster. In considering this mode of workmanship applied to this figure, it is well to hold in mind that it is of a class which aspires to the highest department of sculptural art, namely, that which represents the most refined beauty by means of the careful selection of form, which thus becomes less individual than abstract in beauty, like that which constitutes the perennial charm of the finest antiques. Art, thus directed, labours in a region different altogether from that portrait style which in this country is most employed and encouraged, in which the somewhat hap-hazard touch of the modelling tool on the clay, or even of the chisel on the marble, may have charms for those who do not appreciate higher qualities. With these critics a little inaccuracy or shortcoming in form, or even ugliness, is no bar to admiration, so that a look of freedom and apparent mastery is thereby produced.

In considering the comparative advantages of different materials for the models for statues of the higher poetic class, it may be noted that the nature of moist clay is such as to be somewhat apt, even in spite of care, to occasion incorrectness during the progress of the work, especially when it is in considerable mass, such as is required for a figure of full or heroic size. It has been said of an arch that it "never sleeps," and the same remark may be applied, *à fortiori*, to the substance of a moist clay figure, which, though appearing stable, and firm, and steadfast, is, like a glacier, in a continual condition of change and subsidence, although slight and gradual. A result of this may almost always be traced in taking down a large clay model, after the mould has been made from it, and it has to be destroyed, on which occasion it may be noticed, in the interior parts, that it has always to some extent sunk and subsided from its supports, and separated from them to the degree that slight open spaces are left beneath each transverse iron of the inner framework.

In making the preparatory models for outside architectural features, wherein general effect may be all that is sought to be attained, or for portrait-statues in which vigour of resemblance may be the chief object, it may not be essential to consider their perfect permanence during the process of their execution; but in the higher class of epic and ideal sculpture, in which the most careful selection of forms and proportions is requisite, it may be well worthy of attention to entertain and weigh several advantages which plaster possesses over clay, especially in the completion of a preparatory model before it is transferred into marble.

In the case of a model for bronze sculpture these advantages may not all be so closely to the purpose, inasmuch as clay has, as a preparation for this material, a convenience beyond white plaster in the circumstance of its being nearer in tint to the tone of the metal. Most of the shades of bronze, especially those adopted for large works, are somewhat dark, insomuch that it has been recommended in preparing models for such occasions, a clay of a decidedly dark hue should be employed. For bronze works in the open air in London, it might thus seem most in keeping to use quite black clay, seeing that is the colour which bronze metal soon assumes on exposure to the smoky and vitiated atmosphere of our great city; except but that we cannot but cherish the hope that the exertions which are being made to mitigate these evils may be crowned with success, and that, among the consequent advantages, the bronze statues in our public places may cease to bear the appearance of mere *silhouettes* against the sky.

In returning, however, to the subject of the preparation of models for statuary marble, which may well, indeed, be said to be the one and only divine material for sculpture attaining the size of life, it may be readily recognised that the difference of tint between usual modelling clay and white statuary marble, is so great that the complete effect of a statue in the latter material cannot be fully realised in the former substance. In the usual clay, for instance, the forms of the parts in shadow are indistinct in comparison with marble, in which there is so much reflected light. In white plaster, however, on the other hand, its light tint and lucent qualities enable the sculptor to see into the undercuttings, and trace the form in all the shadowed parts nearly as well as in the future marble, and to a degree which is not possible in a heavy-coloured clay such as that which is in common use; the lighter coloured clays, such as, for instance, that suited for the manufacture of delicate porcelain, not being sufficiently tenacious for large statues, and also, indeed, in a pure state, too costly for that purpose.

For the above reasons, the formative process in plaster itself, of the more refined class of sculpture, to a greater extent than has been usual here, may be worthy of some consideration, more especially when taken in connexion with the two examples which have been cited above of modern sculptors of eminence who have adopted this method, at least in some of their works. Could we unfold the scroll of ancient art-processes, it seems probable the practice of these artists would find its prototype among the Greeks, both in their own country, and in Rome, where also they were so much employed in the production of beautiful statues.

It must, indeed, be acknowledged to be quite possible to execute, *ab initio*, a large statue in plaster without any preparatory clay model, although it is a process not usual in this country. The first objection which is likely to be raised against this is that it might lead to, and superinduce presumably, a certain stiffness of character; and, indeed, this remark has been thrown out in reference to the statue of the Greek slave itself in respect of its having been prepared for in this manner. If, however, this comment can in any degree justly rest on this figure, it may more fairly be laid to the account of the pose adopted, of firmly leaning on one hand, rather than to the mode in which the model for it was executed; for there exists no inherent reason whatever why plaster should not be worked as freely as clay. In this respect a reference to the practice of the decorative architectural plasterman of former days may be to the purpose. In years gone by, his art had a much freer range than at present, when it does not extend much beyond the running of mouldings, and the affixing of decorative portions cast in moulds, and, therefore, often exactly repeated, whereas, in earlier dates of his practice, of which there are fine examples still extant in this country, much of these ornamental details were handwork, executed in the freest manner in wet plaster, and with excellent effect, on the walls and ceilings of which they form the decoration, and, after a fashion, which bears somewhat the same relation to the more mechanical process that ornamental works in wrought iron bear to those that are cast. These examples of the skill of the worker in plaster, may well, in their happy and free effect, bear witness to the easy and natural appearance of which this mode of working this material is capable.

More closely, however, to the subject of making statues in plaster, a sufficient evidence on this point is readily furnished by the statuettes of Pradier thus produced, among the eminent qualities of which may be recognised a remarkable freedom of line and contour as far as possible removed from any stiffness or constraint. In Florence, possibly, Mr. Hiram Powers did not find the Italian plaster so tractable and compliant as that of Paris, and he had maybe a greater difficulty in producing on it a true and even surface, and accordingly he is said to have invented special tools for the attainment of this object. Of these the flat plain ends had little holes sharply punched

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through them, leaving acute edges which planed off all irregularities, while their even surfaces at the same time controlled their action on the faces of the plaster over which they were worked.

However, in general practice it scarcely appears that such special implements are requisite, the usual marble rasps used for working marble statues, which are of great variety of form, being all-sufficient. And at the same time, the employment of these possesses this advantage, that, by their means, no form can be made in the plaster model that cannot with the same description and pattern of tool be exactly and faithfully rendered in the marble: which, on the other hand, is not the case with the modelling tool working on the clay, which implement is often of quite a different section and quality of form from the marble rasp, and thus this diversity has to be allowed for in the transference of the contour and surface thus produced into the marble. On the contrary, in working the plaster model with the same description of tool as that with which the future marble is to be wrought and finished, no translation will be requisite, but the exact same phrases of form will be retained. Plaster of Paris, after the few minutes which it takes in setting from its creamy state into a solid substance, may be worked much like soft stone, and if allowed to dry first, in just the same manner as Bath stone when fresh from the quarry, which, indeed, at that time is scarcely harder. At the same time, of course, it possesses this vast advantage over any kind of stone in the making of a preparatory model, in that it allows so readily and perfectly of being added to as well as reduced.

The following may be enumerated as some of the advantages presented by the process of preparing, or, at any rate, of fully completing, in plaster, a model from a statue. In the first place, it does not require, like a clay model, to be kept moist by sprinkling with water, or by means of being covered up with damp cloths after work, which are apt to injure the surface; but, on the other hand, it may be left always uncovered, and ready to be looked at and worked at at any time. A model in plaster is not liable to shrink by omission of attention to keep it moist, or to detriment by being damped too much. It is not subject to any subsidence or change or depreciation of form; nor will it suffer from frost on any chance occasion of winter rudely invading the studio in which it is being executed. It is also much less ponderous than a clay model, and much more easily moved from one part of the studio to another, so as to obtain variety of view, light, and elevation, so as to enable it to be placed under conditions similar in these respects to the position the completed marble work is destined to occupy, facilities which are of the greatest eventual value during the production of a preparatory model. All the above considerations are of practical worth, and when taken in conjunction with the fact of the light tint of plaster resembling the general hue of marble, may well invite attention to the above subject, and especially to the finishing of the plaster form completely before its transference to the beautiful material in which it may last for ages.

One objection not unlikely to present itself to those not conversant with all the qualities of plaster should not be overlooked, namely, that which may be supposed in its use to exist in the presumed difficulty in making the fresh plaster thoroughly adhere to the old, so as not to scale off in the process of after-work. To meet this comment, without referring to the success of Pradier and Powers in this operation, it may be enough to say that in the recommendation made to use sharp marble rasps in working the plaster, provision is made for exactly that quality of surface to which fresh-mixed plaster adheres most readily and tightly; and if, instead of a spatula being used to put it on with, in its creamy state, a brush is employed, and it be, as it were, painted on, it will enter readily into all the scratches made by the rasp, and become intimately united, and almost homogeneous, with the under-substance: insomuch that when the fresh plaster is perfectly set, it will bear to be worked without any separation taking place; or, in any case, if by accident any small portion is detached, that part may be worked over again with the rasp, and painted over again with fresh creamy plaster, until the surface is quite even, solid, and satisfactory.

It has been a phrase in regard to the different complexion of the usual stages of a work of sculpture, from its commencement to its completion, that "Clay is Life, Plaster Death, and Marble Resurrection"! and this presents a certain truth, namely, that a model has a better appearance in clay than in plaster, which, indeed, in comparison, possesses but a dry, hungry, and uninteresting aspect. It has to be remembered, however, that, while this is a flattering advantage to the clay model itself, yet, when regarded merely as a preparation for the future marble, it changes its character, and becomes, instead, a disadvantage, inasmuch as it cajoles. Whereas, on the other hand, plaster being a material which has nothing specious in its appearance to blunt criticism, and lead the eye to overlook faults, this very shortcoming in good effect is a real benefit in no mean degree, as calculated rather to invite attention to any defects which may exist in the design or execution, insomuch that their being remedied before transference into marble becomes thereby a more likely consequence. Thus, also, it follows that if the plaster model, which palliates no errors, be wrought so as to give satisfaction, by so much the more is it likely to do so in the most exquisite natural material, statuary marble, which kind Nature has provided for the delight of lovers of sculpture.

The above remarks, which are not the result of mere hypothesis or theory, illustrate one province of workmanship which has come under the notice of the writer in actual practice, and, as such, we offer them to the sculptural world for such value as, on due consideration, they may be found to possess.

THE ROYAL SOCIETY OF PAINTERS IN WATER-COLOURS.

It is almost a pity, as we have said before, that the theory of a collection of sketches and studies for the winter exhibition of this society is not carried out in practice. One may marvel, certainly, at the quantity of highly-finished work which some of the members contrive to exhibit in the year; but the result is only a repetition of the summer exhibition; whereas an exhibition really composed of studies and first thoughts would have a quite different kind of interest and instructiveness. Here and there we do find work of this kind sent, but in the main the character of the winter exhibition is undistinguished from that of the summer one.

The present exhibition is not quite one of the best we have seen. There is one contributor of considerable power whom we do not remember here before,—Herr Adolf Menzel, who dates from Berlin. "The Pulpit in the Town Church at Innsbruck" (28) is really an interior view of some extent, and comprising a number of figures, the whole, though on a very small scale, painted with great power and depth of effect; and the same qualities of execution characterise his other contribution, "Suspicion" (363), a somewhat melodramatic figure of a man looking up and half-drawing a dagger. Judging from these works, Herr Menzel is likely to prove an acquisition if he continues to contribute. Another rather interesting item is the appearance of an old friend,—Sir John Gilbert,—in a new line of subject,—an illustration of a scene from "Roderick Random" (178); this comes under the category of studies, and a very spirited and characteristic work it is; we may hope it is to be taken as a sign that the artist has at last recognised the fact that there may be too much of troopers and trumpeters, however dashingly drawn, and is going to put his great talents to somewhat more varied use than the constant repetition of one class of subject and of figure. Among other figure subjects Mr. Walter Duncan offers his ideas of "Benedick" and "Beatrice" (162, 69), which we cannot accept as such; they are not sufficiently refined; his study of a fine, if somewhat blowsy, young woman, under the title "English Roses" (236), is marked by his characteristic power of hand. This artist contributes no less than fifteen drawings, some of them slight, all with something to look at in them; among these "In the Spring Time" (15) is a combination of a very fresh and true sketch of spring foliage and tones in a plantation, with figures of equal excellence in their way. Among the figure-subjects Mr. Radford, whose works we have generally found beautifully finished, but weak in sentiment, really commands admiration, in spite of the same kind of sentimentality, by the admirable drawing and pose of the two figures in "Sympathy" (86). Mr. Tom Lloyd's "Harvest Folk" (230), is an example of a school in which the aim seems to be to blend the figures and landscape into a unity of tone, by way of obtaining unity of sentiment; the picture is a blending of figures and landscape. Where such an attempt is carried as far as it is in this drawing, whatever the beauty of feeling and of tone, which there undoubtedly is, the realism both of figures and landscape has to give way too much, and the result is a group of rather visionary rustics in an equally visionary landscape. The effort seems to be to raise an ordinary scene of field life into the region of ideal art, but we doubt if this is the way to achieve that end. The figures themselves must be striking and pathetic in character, and powerfully treated, to evoke our interest in them; here they are not remarkable in themselves; it is only the light under which the whole group is seen which seems to give them an ideal interest which vanishes when we begin to study them closely. Of course there is a value in this class of art, but after seeing a good deal of it one finds the effect weakened, and we turn rather with refreshment to a drawing like Mr. Waterlow's "Showery Weather" (173), which is real nature and real water-colour, not nature "idyllised" out of all her force and freshness.

Among landscapes of a very high class may be mentioned Mr. T. J. Watson's "Silver Birches" (88) and "Copse-cutting" (105). These combine powerful and natural effect, with an entire absence of hardness or over-finish, which may be said to represent almost the perfection of style for the use of water-colours in landscape. Both these, it is true, are rather foreground landscapes (the distance being shut out by trees and underwood) than landscape in the widest sense. Mr. Thornwaite's "Sunshine" (104) is a large and highly-finished drawing, in which the landscape and figures are beautifully composed, so to speak; but, here again we feel the loss of force from the desire to blend figures and landscape. The drawing is called "Sunshine," but, really, the feeling and effect of strong sunshine are not in it. Mr. Alfred Hunt contributes eight drawings; of which the finest is "Durham" (214) seen through mist lighted by the sun, the cathedral towers and the bridge forming merely faint silhouettes in the misty middle distance. The drawings contributed by Mr. Hunt this year are all strongly-marked by his characteristic effort to render the poetry of nature, and to achieve a manipulation in which the mechanism of the brush is almost entirely concealed, and we see the results without having the method of attaining them forced upon our notice. "Warkworth Castle" (385) is a masterpiece in this way; the old proverb, *ars est celare artem*, could hardly be better illustrated; the drawing will bear the closest looking into; we can follow all the little details of the laying out of the farm grounds, even, in the middle distance, and yet there is not a touch of hardness or of mere realism, not a square inch of the paper in which the delicate aërial modifications of tone in nature are not remembered and brought before us. The effort to avoid mere "painting," however, leads, in some cases, to a want of force in foreground and middle distance, as in "Eastwick Mill" (150), parts of which are exquisitely delicate, but which certainly wants force. "Warkworth Castle" (101), on the other hand, is a very powerful study of a rain-cloud effect; and the comparison of this with the others before named emphasises what is one of the most delightful and remarkable qualities of Mr. Hunt's work,—the total absence of mannerism or of repetition of favourite effects. Among other landscapes, Mr. Matthew Hale's "Bolton Abbey" (24) is a triumph in its way. It is a rather small drawing of what old poets would have called "a sylvan scene," in which we follow the windings of the river and the contours of the hills and woods from point to point, so that we feel as if we could walk through it. It is a drawing that must be carefully examined to realise how true and thoroughly considered it is in every point. Mr. Eyre Walker's "Close of a Wet Day," and "Study on the Greta" (290) are both admirable, the latter especially. Among other things to be singled out are Mr. A. Goodwin's "Maidstone—Sunshine after rain" (368), a brilliant effect, recalling Turner's; Mr. Brierley's "Grey Morning at Venice"; Mr. Glennie's interesting studies of the "Arch of Titus and the Forum" (338); and the "Exterior Colonnade of the

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Coliseum" (305) and other sketches illustrating the architectural topography of Rome; Mr. Norman Tayler's "Windfalls" (landscape with figures, 259); Mrs. Allingham's "Vernal Oak-leaves" (325); and Mrs. Angell's splendid studies of "Poppies," and "Hollyhocks" (122, 125).

TWO MUSEUMS IN ALNWICK CASTLE.

PROBABLY a very limited number of antiquaries were aware, until very recently, that his Grace the Duke of Northumberland is the fortunate possessor of two very interesting and representative museums, carefully arranged and displayed in the historic castle at Alnwick, which has been for so long a period the home of his ancestors. Now, however, that comprehensive and detailed catalogues of these two great and valuable collections have been prepared by competent authors, and printed and illustrated at considerable cost by the owner, who has enhanced his liberal patronage of archæology by judiciously distributing the copies of the catalogue among public libraries and societies, and in quarters where they are sure to be duly appreciated, we propose to give our readers a short account of the principal contents of the respective museums. Taking the Egyptian Museum as containing the relics of the greatest antiquity, for the present, and reserving for future consideration the equally important collection of British and Roman antiquities which compose the other museum, we may compliment Dr. Samuel Birch, of the British Museum, for the very instructive catalogue * which he has written of objects with which his long acquaintance with similar antiquities in the British Museum has rendered him perfectly familiar. This collection, probably the largest in England after that preserved in our national collection, was originally formed by Algernon, fourth duke of Northumberland, who, when enjoying the dignity of Baron Prudhoe, prior to his accession to the dukedom in 1847, had spent some years in the land of the Nile, visiting and examining most of the principal historic and templar sites and notable monuments, and giving much time and thought to the elucidation of the language, chronology, and history of Egypt. The acquisitions then made by Duke Algernon form the nucleus of the present museum of Egyptian objects at Alnwick, to which subsequent additions were made, when the opportunities afforded by the sale of Salt's collection in 1835, and Burton's in the following year arose. Some idea of the historic and antiquarian value of this collection may be gathered from the fact that the late Sir Gardner Wilkinson published several of the more important historical monuments in his great work the "Manners and Customs of the Ancient Egyptians," and Professor Lepsius drew much information from the inscribed scarabæi and other relics for his "Königsbuch." According to the learned author, who has arranged the objects in the catalogue in a classification which enables the student to turn at once to the section which he desires to study, the museum contains several works of art of historical value and specimens of sculpture of the earliest and best period of Egyptian art, conveying an excellent impression to the beholder of their peculiarity and importance. The antiquities of Egypt, here so well and so typically represented, owe much to the fact of being under the influence of a favourable climate, which has done no harm to the most tender relics and perishable materials. These, if exposed to colder and more humid atmospheres, would long since have crumbled away and disappeared. Another fact which explains in a great degree the preservation of so varied an assemblage of artistic relics is that common objects of domestic life, as well as objects of a purely sepulchral and mortuary nature, have been deposited from three to five thousand years ago in the deep silence of rock-hewn underground tombs, which have stored up, as it were, and preserved for intelligent study to-day, not only things made of hard stone and precious metal, but even animal and vegetable substances; for instance, the dried pomegranates, and the inscribed linen mummy cloth, after the inhumation of three or four thousand years, are in much the same condition as when pious hands first deposited them in their hiding-places. It has also to be borne in mind, we are told, that, after all, only a small proportion of antiquity of any nation, however much civilised it may have been, remains from which we may conjecturally reconstruct its domestic and political condition; and the most extensive collection of relics consists but of scraps of a vast and changing civilisation rescued from oblivion.

The classification which the author has adopted, reduces the miscellaneous objects to an order which enables the reader to form a definite conception of the correlative importance of them in regard to the reconstruction of an Egyptian era. The first, and one of the greatest divisions, is that of the figures of the deities who make up the Pantheon of Egypt's mythology. These figures consist of representations of gods, each one with his proper emblems and attributes, or in his conventional attitude, made of metal, stone, wood, or porcelain, ranging in age from the seventh to the twelfth century B.C. Many are exquisitely carved in materials of difficult manipulation, thus indicating the height to which the sculptor and carver brought their respective arts at this remote period. Some of the golden and silver figures are solid; others, made of thin foil, have rings attached to them whereby they were strung upon necklaces placed upon the richer kind of mummies. Particular substances appear to have been adopted for particular deities; thus Amen-Ra, Osiris, Isis, and Horus are rare in porcelain, but common in bronze; the triple god, Ptah-Socharis-Osiris, and Shu or Sos, occur in porcelain only. A figure of Nefer-Tum, a Memphite deity, in white stone, 7 in. high, is of great rarity (No. 43 in the catalogue), from the fact of its containing an inscription in which the names of Thothmes III. of the eighteenth, and Rameses IV. of the twenty-eighth dynasty, are found. No connexion of these two widely-separated monarchs is known to have existed, except in this one instance. The bronze figure of Osiris (No. 163); the tablet containing figures of Harpachrat or Harpocrates and the Goddess Sechet, of Æthiopic work of the Roman period, perhaps representing an emperor adoring the goddess, in calcareous stone, 10¾ in. high (No. 273); and the inscribed figure of Bes, dedicated by King Sheshank, of the twenty-second dynasty, to Isis, in arragonite, 8½ in. high (No. 313), are worthy of notice in this section.

Next to the worship of the many gods came the veneration of sacred animals, such as the cynocephalus, ape, lion, bull, cat, sphinx, jackal, calf, ram, hawk, ibis, duck, vulture, crocodile, uræus snake, scarabæus, toad, and frog. It is curious, however, that the creature which was considered sacred in one town would perhaps be neglected or despised in a neighbouring locality. The origin of this topical worship and abhorence of animals is undetermined, but has been referred to the archaic period of the second dynasty, when one of the monarchs is believed to have introduced it into Egypt. Some light has, however, been thrown upon the obscure question of animal worship by discoveries at the Serapeum, where the bull Apis is called the avatar or second and repeated life of Ptah, the local and tutelary deity of Memphis. These animals in lifetime were oracular in the districts where their cult was established, and they spent a happy existence in the courts of temples under the care of the prophets and priests, certain revenues being devoted to providing them with fitting sustenance, and even with suitable mates. After death they were mummied. Their figures in coloured porcelains, slate, basalt, bronze, sycamore wood, steatite, carnelian, lapis-lazuli, jasper, green felspar, and other substances have been carefully arranged in glass cases by Dr. Birch at Alnwick in the room which contains the Duke's Egyptian Museum.

The section devoted to a consideration of kings and noble personages, although not a large one in point of numbers (as would naturally be the case, for the transport of one heavy monument is manifestly more difficult than that of a thousand small objects), yields to none in point of interest, for in it are comprised most of the historical relics. Statues appear in Egyptian fine arts as early as the third dynasty, and one figure in the Alnwick collection belongs to that remote period. It has been found that the method of making metal statuettes was to cast them in moulds over sand-cores; those of stone and wood were cut from solid blocks, and although occasionally represented completely carved, they generally have the parts between the legs and arms and body left solid, and are furnished with plinths up the back, thus partaking, in some degree, of the nature of a double bas-relief. Another remarkable feature in the art of the Egyptian statuary is that walking figures have always the left foot advanced, and all figures, except of children, are furnished with drapery. There are but few conventional attitudes, and in bas-reliefs the figures are rather salient, and nearly always in profile. Portraiture, or rather Iconic statuary, was in use at all times. Distinct canons of simple proportion are known, which furnish diacritical marks to the antiquary, whereby he may determine, within certain limits, the age of the monument. The oldest canon is in subdivisions of ¼ ft. or ⅓ ft.,—this is of the third dynasty; the twelfth and thirteenth dynasty made the height eighteen half-feet, and the canon of the twentieth dynasty divided the whole height of the statue into twenty-one parts. All this has been carefully examined by the late Joseph Bonomi, an architect whose love of Egyptian antiquities especially fitted him for successful research into this interesting technical subject. The steatite monument, representing King Amenophis I. and his Queen Aahmes-Neferari (No. 495); the imperfect figure of King Amenophis III. (No. 496); the fragment containing a likeness of Queen Hatasu, the warlike sister of the illustrious Thothmes III., marching with the victorious army of Egypt, which conquered Syria and Palestine, advanced the power of Egypt to the banks of the Tigris and Euphrates, extracted tribute from Assyria and Babylon, and visited Somali and Socotra to collect guns, spices, and cosmetics (No. 500); the statue of Ptahmeri, high priest of Amen (No. 508); the fine black granite statue of Paser, a prince, monarch, and governor of a district in the time of Rameses II. (No. 511); and some others in the section, are enriched with inscriptions which claim the attention of the historian and philologist.

Architectural objects, the next in order, are very few, but there is a remarkable bronze corbel, 1 ft. 5½ in. long, 4½ in. high, and 3 in. wide, having in front a lion couchant in a niche. This has formed part of a monument, but of what kind is unknown. It is hollow inside, and was probably cast with a core. Furniture was a special development of ancient Egyptian fine art. The inscribed head-rests like diminutive crutches, inscribed legs of chairs made of ebony, and fragments of inlaid work, serve to show how elaborate must have been the movables in the rich man's house in the time of the Pharaohs. Objects of personal adornment were lavishly bestowed in the decoration of the mummy, before it was laid to its final rest in the gaily-coloured coffins, richly inscribed with extracts from the "Funeral Ritual." Head-dresses, wigs, skull-caps, collars, chains, necklaces, sashes, shoes and sandals, signet-rings in every kind of precious metal and stone, pastes, glass, and ornamental leatherwork, are found in the tombs, and many very fine examples of these objects have been secured from time to time by the late Duke Algernon for the Alnwick Museum. The necklaces are of interest for their pendants, in form of the pomegranate, figures of deities and hearts (Nos. 542-4); crocodiles, scarabs, and fruit (No. 545); jasper beads in form of Osiris, Harpocrates, and Bes; hearts of carnelian, sard, jasper, basalt, and steatite, scarabs carved in many kinds of precious stone, some having a hawk's head in place of the usual insect's head; a papyrus sceptre of green felspar (No. 637); flowers, cowroids, cylindroids, and other forms, are met with in considerable array, and of more or less rarity. Some of the precious stone rings in this class are penannular, and their use is uncertain, but judging from some of the gold rings of this shape which are furnished with a small ring at each end to admit a cord or wire, they may have been earrings or pendants of necklaces if capped with gold. Their exact use, however, does not appear in the different representations of Egyptian dress which are met with on the monuments. The signets and finger-rings include several with royal and religious names. Thus, the goddess Mut, Amenophis II. of the eighteenth dynasty; Amenophis III., Ptah or Vulcan, Thothmes III. and IV., and Rameses II. of the nineteenth dynasty, are found on choice rings in this collection (case 19). Sandals, mirrors, cases for holding *stibium*, which was a cosmetic having

* "Catalogue of the Collection of Egyptian Antiquities at Alnwick Castle, belonging to his Grace the Duke of Northumberland." By S. Birch, D.C.L., LL.D., F.S.A., keeper of the Egyptian and Oriental Antiquities in the British Museum.

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for its base a kind of sulphuret of antimony, employed by both sexes to impart brilliancy to the eye; combs, tweezers, razors, and other paraphernalia of the toilet abound. One fine stibium-case (No. 758) is formed from the tooth of the hippopotamus, an animal hunted by the ancient Egyptians, and at one time fairly numerous on the reedy banks of the Nile. The inscriptions upon some of these cases are of great interest.

Scarabæi, either as bezels of rings or strung on mortuary necklaces, form an abundant feature in the Museum, as indeed in all Egyptian collections; for although perhaps the most mystical in its signification of all Egyptian emblems, it is certainly the most common object of Nilotic antiquity. Hence its frequent imitation by the modern Arab, who is generally too successful in palming off his spurious manufactures upon the credulous. But the scarabs in the Alnwick Museum were acquired before this nefarious art began to flourish, and the same may be said of the scarabs in the British Museum, and thus a study of these two extensive repositories of inscribed scarabæi will impart a truer technical knowledge of Egyptian historic art than the examination of numberless collections formed after the practice of manufacturing antiquities had become rife in Egypt, and thus far sullied the genuine character of the collections, which they too often injure by their presence. Apart from the names of deities upon these symbolical objects, many names of monarchs of remote dynasties are found inscribed upon them. They are chiefly of the soft soap-stone or steatite of native occurrence, glazed; some, however, are of green felspar, blue glass, porcelain, and other materials. One very remarkable object in this class is like two frogs united together, and inscribed on the base with a winged uræus, the emblem of a goddess. The frog appears rarely in the hieroglyphics, and then is used as a determinative sign of the goddess Heg or Hega, wife of Khnum, the creator of mankind. This little object in light-blue porcelain is only one-fourth of an inch long. Another very archaic scarab (No. 923) is inscribed with the name of Saafra, Kefren, or Chabryes, a king of the fourth dynasty, successor to Cheops, and builder of the Second Pyramid. The object is, however, not necessarily contemporary with the king whose name it bears, for priests who carried out the worship of the sanctified monarchs of the fourth dynasty were attached to these duties until a late period in Egyptian history. Another amulet (No. 925) bears the name of an early monarch, apparently of the fifth dynasty. King Tancheres, of the same dynasty, is recorded by name on the following scarab. Scarab No. 1,030 is of historical value, as affording material, by its long inscription, for placing the date of King Amenophis III. at about 1300 B.C. These scarabs, of which we have mentioned a few important examples, number upwards of five hundred. Passing over several interesting objects, mention must be made of a fine opaque blue glass vase, nearly 3 in. high (No. 1,403), in shape of the Greek *oxybaphon*, the use of glass in Egypt being as old as the twelfth dynasty, if not earlier.

Of the class of vegetable substances, good examples are preserved at Alnwick of dates, corn, figs, seeds, barley bread, grapes, and pomegranates. The weapons in the museum consist of inscribed *batons* of sycamore wood, a dagger inscribed with the name of Thotmes III., and other daggers of bronze, a bow, reed arrows, and bronze arrow-heads. Among the writing utensils is the inscribed cedar-wood pallet (No. 1,451) of Ptah-meri, or Meri-en-ptah, a scribe of the royal treasures; some papyri, and a memorandum-book, or *pugillaria*, of the Greek period, are worthy of notice. The ornamental boxes of wood, thickly covered with tempera painting, are rare and choice, forming, as they do, fine examples of the joiner's or cabinet-maker's art of three thousand years ago. The use of the lock was unknown at this period, but a fastening was effected by means of two studs, one on the lid, the other near it on the box, and by tying a cord tightly round these studs, and then sealing the knot, the contents were made secure from surreptitious handling. These boxes are generally rectangular, sometimes enriched with recurved cornices, and, if used for sepulchral purposes, painted elaborately and inscribed. Ivory slips, and ebony inlaid with glass, ivory, or porcelain, are not of uncommon use for boxes. One rare specimen, unlike the usual form of sliding lid, has a hinge of cylindrical shape cut out of the solid wood, like the modern snuff-box. Of two fine boxes with pent-roofs (Nos. 1,459-1,460), Dr. Birch gives a lengthy account, the inscriptions with which they are enriched being of considerable importance.

The tools are puny and apparently of little real use as tools; it is far more reasonable to suppose them to have been made for mortuary rather than practical purposes. Still, their forms, and the inscriptions they carry, invest them with an interesting character. Human mummies do not occur in the Alnwick Museum, but there are several mummies of cats, one of the jackal of Anubis, and one of the Ibis, or messenger bird, sacred to Thoth. Some fragments of the inscribed linen bandages of mummies have vignettes and the text of certain chapters derived from the Funereal Ritual or "Book of the Dead." Many of these texts are of high value to the student of the hieroglyphics and the philology of Egypt on account of their containing variants and synonymous expressions which elucidate many obscure points in the language. The amulets and sepulchral scarabæi must be passed by in a few words, although they are of great variety. The former class comprise pendants of various forms, beads, hearts, sceptres, the *bat* or so-called Nilometer, pectoral plates, heads, flowers, cartouches, bugles, models of finger-rings, disks, vipers' heads, feathers, collars, buckles, square and rectangular tablets, pillows, and levels or squares. In size they vary from ⅛ in. to 1 in. The workmanship is fine, and so strongly marked with technical Egyptian treatment that the eye soon begins to be able to distinguish the peculiar, but undefinable, character of the work from that of any other people. The materials of which these minute objects are composed consist of glass, porcelain, steatites of various colours, felspar, lapis-lazuli, burnt jasper, black oloidian stone, serpentine, cornelian of several shades, hematite, schist, basalt, sard, and other hard substances native in, or foreign to, Egyptian quarries. The sepulchral scarabæi, of different style and character to the scarabs used as seals, stamps, or rings, were deposited with mummies, and are of very remote antiquity, the chapter of the ritual with which they are inscribed being attributed to the earliest period of Egyptian history, from the second to the fourth dynasty. These are generally from 2 in. to 3 in. long, and formed of steatites, felspars, jaspers, basalt, or serpentine. Many of them introduce the name of the deceased person for whom they were made into the formulary chapter inscribed upon them; others, however, are uninscribed, or have the conventional name "Men.," which corresponds to the "M. or N." of our catechism for an unknown name. The numerous class of sepulchral figures, found deposited in tombs, set in boxes, or strewn along the floor, is well represented in this collection, those of copper, ebony, and steatite being rare. They are generally made of glazed porcelain or clay, mostly of rude workmanship. In date they range from the eighteenth to the twenty-fifth dynasty. They are supposed to represent the deceased personage in a justified or Osirian form; the sixth chapter of the Ritual, or some portion of it, being inscribed or painted upon them in horizontal or vertical columns. Good notices of these figures, and of the place they occupy in the religious practices of the Egyptians, is contained in the "Zeitschrift für Ägyptische Sprache," 1864, pp. 89-103; 1865, pp. 4-20, to which the attention of the student may be directed. Some of these little figures appear to have been taken from the tomb of Seti I., in the "Biban-el-Moluk," or "Tombs of the Kings" in the neighbourhood of Thebes. This important exposition of antiquities concludes with a long section of about fifty tablets in calcareous stone, and a few wooden tablets, a sepulchral altar, obelisk, pyramidion, sepulchral vases, cases, lamps, and miscellaneous or later objects. The inscribed sepulchral tablets are treated in the most instructive manner and with great detail by the author, who, perhaps better than any Egyptologist who has yet set his mark upon the Temple of Fame, is able to explain the minute points of domestic and religious life which they silently, but not less on this account eloquently, illustrate, when they are brought under the eye of one who can read their inscriptions and decipher their peculiar pictorial and glyptic arrangements as easily as Dr. Birch. The Duke of Northumberland is to be congratulated not only on the possession of this representative collection, but also on having secured the services of so distinguished an Egyptian archæologist, and the lover of Nilotic antiquities and philosophy will be, we have not the least doubt, delighted to find in this catalogue a compendious encyclopædia of a branch of archæology for which he would have to seek in vain elsewhere.

THE AMALGAMATION OF THE WATER-COLOUR SOCIETIES.

A curious little correspondence has recently been taking place in the *Times* in regard to the water-colour societies, which seems to be really a larger question than it is in the opinion of these writers. It appears that some time ago the Institute of Painters in Water-colours endeavoured to procure an amalgamation with the Royal Society of Painters in Water-colours. Being unsuccessful, they opened negotiations with the Dudley Gallery, and a kind of partial amalgamation is the consequence. The desire of the *Times* and of its correspondents would appear to be that these societies should be united and should form a water-colour academy. We venture to think that the existing state of affairs is much better for artists, for art, and for the people of this country. The mere fact that there exists a chief society, honoured by marks of distinction, small in numbers, and recruited from the best water-colour painters of the day, necessarily causes artists to be put on their mettle, so as to be admitted within the charmed circle. It may be said that even if the other societies were amalgamated with this society, the chief members of the new union might be distinguished from less noticeable artists as the R.A.s are from A.R.A.s and simple exhibitors at the Royal Academy exhibitions. But one of the things which most lovers of art deplore is the amount of rubbish that necessarily gets, by hook or by crook, into a large exhibition, and overwhelms much of the best work. When a small and select society, such as the Royal Society of Painters in Water-colours, exists, the exhibitions are necessarily on a high level; for a member to exhibit bad pictures lowers the tone of the whole exhibition, and therefore it is that the exhibitions of this society form the most delightful and most instructive exhibition of water-colours in the world. Accordingly, to have an aged and honoured society at the head of the water-colour societies seems to us distinctly to the advantage of English art. Of course, we by no means say that we can go only to the exhibitions of this society for good water-colour drawings, but we repeat that we think it would serve no good purpose to have this exhibition, which retains so high an average character, lowered by the inferior works which must find their way into larger exhibitions. Moreover, a certain friendly rivalry between the older and the younger bodies is in itself healthy, and the management of each is certain to be kept more efficient by such a rivalry. Further than this, when there exists an old society, filled chiefly with veterans, the younger society naturally seeks out the rising painters, so that they may, as they frequently do, render the less select exhibitions noticeable by works not only fresh and vigorous in themselves, but having fresh interest to the public, by reason that their authors are less widely known. There is also another point to be noticed, and that is that, even supposing a union of the several water-colour societies took place, there will always remain exhibitions of water-colours at the Royal Academy, at the Grosvenor Gallery, and at the Suffolk-street Gallery, not to mention the rooms of some well-known dealers in art. Therefore, when once such an amalgamation took place the probability would be that even more water-colours would be exhibited elsewhere than is at present the case. Certainly, too, regarded from the point of view of the amateur, such an amalgamation would be a distinct loss. One of the charms of the present water-colour exhibitions is that there at least some of the most refined and most characteristic specimens of modern English art can be seen in the quietness which should reign in every gallery. Nothing can well be imagined more hostile to what may be termed picture enjoyment than the throngs who crowd the rooms of Burlington House. Nor is the fact that in one gallery age, and in another youth, are to be studied, one of the least of the advantages of the present arrangement. But it is

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said that what may be called a Water-colour Academy would be able to establish a school for the teaching of water-colours. It may be a conservative sentiment; but we confess that we doubt if English water-colour art would be improved by such a school. The English school of water-colour painters are supreme in their art, and we fail to see how it would gain by the establishment of such an academy. Moreover, in London at least, sufficient opportunities exist for the learning of art. There is the Royal Academy, and the Slade School at University College, and there is South Kensington, and the water-colour painter who would make a name for himself must finish his education, not in any school, but among the lanes of Surrey and the valleys of Wales. Hence we cannot regret the failure to establish one large water-colour society. It is a mistake to suppose that English art would obtain from it either an immediate or a lasting benefit.

THE NEW ACT ON BILLS OF EXCHANGE, PROMISSORY NOTES, AND CHEQUES.

BARREN as the recently ended session has seemed in general measures, it will be remembered as a noticeable one in regard to legal matters. We have already commented on the Settled Land Act, and shown how important a statute has thus been enacted. But there is also another Act well worthy of notice, which should be welcome to all men of business. We refer to the Bills of Exchange Act,—a measure of no striking general interest, but, as we have said, of great legal and commercial importance. When we consider how necessary it is that every business man should be acquainted at least with the outlines of the law relating to negotiable instruments, and when we recollect that hitherto this branch of law, like most others in this country, has had to be discovered in volumes of legal reports and text-books not of the smallest size, the cordial welcome which should be given to the new Act must be obvious. The Bills of Exchange Act, 1882, is but the short title to an "Act to Codify the Law relating to Bills of Exchange, Cheques, and Promissory Notes." The mere fact that a code of even a small and somewhat technical branch of law should at last have been enacted, would alone form a mark in our legal history, and will doubtless in the future be noted as the commencement of an epoch which will in time see the whole of our law placed in a more systematic form than that of being embedded in innumerable volumes of reports and hardly less voluminous text-books. Moreover, the fact that this particular bit of law which relates to what may be termed a limited class of negotiable instruments has been the first to be codified, shows what has long been evident to careful observers, namely, the immense effect of English commerce and business upon our laws and upon law reform in general. It has not been the criminal law,—that which affects the lives and the property of the English people,—which has been first systematised, but a technical branch of the law of contracts, which, in the main, and if we except that which relates to cheques, is almost wholly of interest to the business community. It would be out of place to specify other particulars in which this effect of English commerce is visible in the changes of English law, but we may mention one only which is connected to some extent with the present subject. Long before the provisions of the Judicature Act came into operation, by which judgment was allowed to be signed in a claim for a fixed sum if the debtor could not show a good ground of defence, this procedure had been in operation in regard to bills of exchange by the Bills of Exchange Act, 1855, which formed the model for the more general procedure introduced in 1873. Yet another circumstance stands out very clearly in relation to this new code, and of a very encouraging character. It is the effect of individual effort upon English law. Without the individual exertions of Sir James Stephen it would have been hopeless for some time to come to have expected a criminal code; without the general effect of this judge's labours and that of Mr. Pollock and others, it would hardly have been possible to have got a sufficient force of professional or public opinion in favour of the codification of English law. The triumph of individual energy is still more complete when we recollect that Mr. Chalmers, the draughtsman of the present Act, is likewise the author of a digest of the law of bills of exchange, which may be considered the precursor and cause of the present Act.

To discuss minutely an Act which comprises 100 sections, and which deals with a technical subject, would be impossible, but it may not be out of place to observe how far this new code conforms to the main principles which should be kept in mind by every draughtsman, namely, simplicity of language, clearness of expression, and harmonious arrangement of the subject matter. On the whole, there is but little fault to be found with the Act, though it seems that what may be called the table of definitions might have been enlarged so as to comprise at the beginning of the code all the definitions which are required for the purpose of the Act. The definitions are mostly comprised in section 2, but we find them also scattered throughout the Act. Thus, the definition of "British Islands" occurs in section 4, and "month" in section 14. Again, "reasonable time" is twice defined, in sections 40 and 74; it would have been quite possible to have made one clear definition of this term at the beginning of the Act, in what we have already termed the table of definitions. So far as regards clearness of expression, we have hardly any adverse criticisms to make. There are many places where more happy expressions or more concise terms might have been used so as to make, if we may apply the epithet to a legal measure, the code more artistic. But the existing language is clear and not obscure, so that the same object is attained. There is, indeed, one section which will certainly puzzle both laymen and lawyers, namely, the first sub-section of section 74, which deals with cheques. It runs thus:—"Where a cheque is not presented for payment within a reasonable time of its issue, and the drawer or the person on whose account it is drawn, had the right at the time of such presentment as between him and the banker to have the cheque paid, and suffers actual damage through the delay, he is discharged to the extent of such damage, that is to say, to the extent to which such drawer or person is a creditor of such banker to a larger amount than he would have been had such cheque been paid." The sentence is a great deal too long to be read without an effort, and length in such cases is no small cause of obscurity of meaning. But if we look closely at this section it is hardly possible to understand it. The first part clearly states that if a cheque is not presented within a reasonable time, and the drawer suffers damage, he is discharged to the extent of such damage. Thus, if A draws a cheque for 50*l.* in favour of B, and B, instead of presenting it at once, delays to do so, and meanwhile the banker on whom it is drawn fails and ultimately pays ten shillings in the pound, A suffers damage to the extent of 25*l.*, having so much less cash with which to pay his cheque. Therefore, as to this amount he is discharged as regards B, the holder of the cheque, who did not present it within a reasonable time, and who must bear the consequences of his negligence. But the customer cannot be a creditor of the banker for more than the actual amount which the banker held for him. Yet the extent of such damage is stated by the section to be the larger amount to which the customer is a creditor of the banker in consequence of the non-presentment of the cheque in due time. There, no doubt, may be some explanation of the section, but it is obvious that it is obscurely drafted, and, as we have already said, obscurity in a legal and commercial code is a grave fault.*

The Proposed Statue of Burns for London.—The statue of Robert Burns which Mr. J. G. Crawford, a retired Glasgow merchant, long resident in London, is desirous of erecting on the Victoria Embankment, with the sanction of the Metropolitan Board of Works, will be entrusted to Sir John Steell, R.S.A., the sculptor of the statues of the poet recently erected in Dundee and New York. The London statue will (the *Scotsman* states) be of bronze, the pedestal being of Peterhead (red) granite, and it will be executed by Messrs. Macdonald, Field, & Co., of Aberdeen. The entire monument will stand 16 ft. high, and is estimated to cost about 2,000*l.* The proposed site is in that section of the gardens containing the statue of another eminent Scotsman,—Sir James Outram,—between Westminster Bridge and Whitehall-place.

* It may be useful to point out that there are now several handy editions of this Act to be purchased.

THE SITE OF THE ROYAL COURTS OF JUSTICE.

THE removal five years ago of Temple Bar gave the *coup de grace* to a third clearance that within the last hundred years has been made in the eastern portions of the parish of St. Clement Danes. Through good and evil days Wren's gateway had stood for more than two centuries. Its predecessor,—a wooden postern,—figures in each of the older maps, including the first, of London; in the memory of living men there remained beneath its shadow an ancient bulk-shop said to date from the reign of King Henry VIII. The "posts, rails, and a chain" mentioned by Strype, which separated the liberties of London and Westminster, are spoken of as "*barram Novi Templi*" in a grant of the 29th Edward I. Thenceforward the Bar played its part in many a stirring scene of our home history. Witness to the funeral obsequies of the victor at Agincourt and of Elizabeth of York, it has been decorated in honour of the coronation processions of Anne Boleyn and Edward VI., of Mary and Elizabeth. Its head has reared above the flames and smoke of the bonfires which celebrated the discomfiture of the Rump Parliament, and those that blazed at the Protestant riots on each anniversary of Queen Elizabeth's accession. Its pediment has frowned hideous with the heads and limbs of traitors. Nor was it without associations which appealed to emotions of another kind. Many a time in adverse days have England's sweetest poet and her rugged, albeit tender-hearted, moralist passed friendless and unknown through its portal; as often have they in more prosperous times walked through it together to or from their chambers in the Fleet-street courts or the Temple. The remains of Reynolds, Nelson, Rennie, Sir Thomas Lawrence, and Wellington were carried to St. Paul's beneath that archway, through which, to the same cathedral, went the present heir-apparent to the crown and an aged king, both to return thanks for their recovery,—the one from illness, the other from one of the most terrible of human afflictions.

The north side of Fleet-street formed the principal part of our Saxon city. In Ethelred's reign London had more buildings west of Lud Gate than were in all that portion where the "City" now is. In the year 1353 the Strand was still an open highway, having here and there a bishop's "inn" with its garden to the river's side. So neglected was the road that in this year King Edward III. made an ordinance for a tax to be raised upon wool, leather, wine, and all goods carried to the staple at Westminster wherewith to provide for its repair. But about the middle of the sixteenth century the settlement of the Court again in the west, at Whitehall, brought about a change. Houses gradually appeared at either hand and around the New, Lyon's, and Strand Inns of Court,* though for a long period open country still lay beyond the northern side; the gardens about the old Convent Garden site were bounded by fields, St. Giles's remained a distant country village,† and the citizens would stroll in the evenings to St. Clement's Holy Well. In King Charles I.'s reign Covent-garden began to assume its present aspect. Fiequett's Croft, otherwise termed Templars'-field, was laid out in Carey-street (*antiq.* Jackanape's-lane), Boswell-court, Portugal-street, Serle-street, and New-square (*antiq.* Serle's-court); whilst of Inigo Jones's more ambitious scheme there remains Arch-row along the western side of Lincoln's Inn-fields. About 1640 the space between this and Clement's Inn was covered with Clare Market, and other small streets and alleys. There thus sprang up in the last-named quarter Ship-yard, Crown-court, Crown-place, &c, with the almshouses and vestry of the parish, all of which were pulled down at the end of last century in pursuance of Alderman Pickett's project for throwing open the church of St. Clement Danes, which Pierce had

* *New Inn* (where Sir Thomas More studied before entering of Lincoln's Inn), formerly "Our Ladye's Inne," for travellers, was given by Sir John Fineux, Lord Chief Justice, *temp.* Edward IV., to the law students of St. George's Inn, Old Bailey. *Lyon's Inn* stood formerly on the northern side of Holywell-street, over against the passage, bearing a carved lion's head, from the Strand. *Strand Inn*, formerly Chester's Inn, was destroyed *temp.* Edward VI., for the Duke of Somerset's new palace. King's College occupies the site.

† The lord mayor and aldermen used, on the occasion of their annual visit to the conduits, to hunt a hare before dinner, and a fox after it, in the fields near St. Giles's.—"Picture of London," 1824.

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built under the superintendence of Wren. Butcher-row, which had been a flesh-market from the days of the Tudors, was replaced in 1813 with Pickett-street. The further changes of some twelve years ago included the removal of part of Clement's Inn and lane, of much that was left of Clare Market, of Shire-lane, Boswell-court, Bear-yard, and portions of Carey-street and Bell-yard. Fleet-street has already contributed to the sacrifice, whilst the Inn and the courts to the south of King's College Hospital will not long survive.

It will be seen, then, that the Courts of Justice have arisen in a district which, in late years at least, enjoyed no enviable repute. But all the above-named places have histories of their own that are abundantly marked with names and events strikingly at variance with those which render their subsequent memorials so notorious. St. Clement's Well was one of the "excellent springs . . . whose waters are sweet, salubrious, and clear, and whose runnels murmur over the shining stones" mentioned by Fitzstephen.* The inn represents a hostel where the penitents who, as early as Ethelred's reign, resorted to the spring, lodged. The hostel in time became a religious house, which, in its turn, was converted into an Inn of Chancery, cited in a record of the 19th King Edward IV. In 1486 we find it possessed by Sir John Cantelowe, whose interest afterwards passed (20th Henry VIII.) to William Holles, Lord Mayor, ancestor of the Dukes of Newcastle and Earls of Clare, who resided where is now Clare Market, and of whom the second earl, removing to Drury-lane, demised the Inn to the then principal and fellows. St. Clement's Inn, where "they will talk of mad Shallow yet," should divide its claims to celebrity between that worthy and Lord Chief Justice Sanders. In the garden (a charming corner of Old London) is the bronze figure of a kneeling negro supporting a sun-dial, a present from an Earl of Clare, which occasioned the stanzas :—

"In vain, poor sable son of woe,
Thou seek'st the tender tear;
For thee in vain with pangs they flow,
For mercy dwells not here.

From cannibals thou fledst in vain,
Lawyers less quarter give:
The first won't eat you till you're slain,
The last will do't alive!"

Gay's "Trivia" contains a lively and faithful picture of Butcher-row, which lay to the north-east of the church. Here were Betty's and Clifton's eating-houses, the latter frequented by Dr. Johnson. It was in returning from the Bear and Harrow, in the Row, through Clare Market (where one or two penthouses and the last of the bulk-shops may yet be seen) to his lodgings in Duke-street, that Nat Lee, overcome with wine, fell down and was suffocated in the snow. In the churchyard close by, where he was buried, rest another poet, Otway; Lowen, an original actor of Shakspeare's plays; Rymer, compiler of the "Fœdera"; and Mountford, the actor whom Lord Mohun killed in Howard-street, at Mrs. Bracegirdle's door. Joe Miller, "a facetious companion and an excellent comedian," was buried (1738) in the parish ground over which the hospital now stands. Clement's-lane formed a fashionable quarter in the closing years of the seventeenth century. Here lived Oliver Cromwell when a student of Lincoln's Inn, as also Sir John Trevor, Master of the Rolls, who when Speaker had to pronounce his own conviction and dismissal for bribery. By the eastern end of Butcher-row was a fine old gabled house of date 1581, its front profusely decorated with coronets and fleurs-de-lys, the residence of the Count de Beaumont, French ambassador to King James I.'s Court. Johnson-court, Fleet-street, and Boswell-court are vulgarly believed to owe their styles to the Doctor and his biographer. As a matter of fact, the former was so named long before its most famous inhabitant removed thither (in 1765) from the Inner Temple-lane; the latter was so called after a Mr. Boswell, from whose house Gilbert Talbot (1589) dates a letter of town gossip to his father, the celebrated Earl of Shrewsbury. The parish register chronicles, under date September 5th, 1611, the burial of "W. Ewins, esquier, from Boswell Howsse." The house and its courtyard were built upon as early as 1615. Sir Walter Raleigh's widow lived here, as did Sir Richard and Lady Fanshawe, with, in 1635, *teste* the rate-book, the Lord Chief Justice and Sir Edward Littleton, Solicitor-general. This lane (*alias* Rogue's-lane, and latterly Lower Serle's-place), at Temple Bar, abounded with reminiscences of the past. Andrew Marvell refers to the "Trumpet" in Sheer-lane, being the same tavern, at the upper end, whence Isaac Bickerstaff dates many papers to *The Tatler*, and where the Tatler met his club. From the "Trumpet," since known as the "Duke of York," the Tatler led down into Fleet-street that immortal deputation of "twaddlers" from the country who, as a celebrated writer observes, hardly seem to have settled their question of precedence to this hour. Moreover, in Shire-lane originated the famous Kit-Kat Club, a society of thirty-nine distinguished noblemen and gentlemen zealously attached to the House of Hanover. Walpole, one of their number, says they were "generally mentioned as a set of wits, in reality the patriots that saved Britain." They took the name of Kit-Kat either from Christopher Katt, the pastrycook, at whose house they dined, or from his excellent mutton pies which are mentioned under that name by more than one writer of the day. Their toasting-glasses, engraved with verses in praise of the beauties to whom they were severally consecrated, are pleasantly commemorated in the well-known epigram attributed to Pope, but believed to be by Arbuthnot. Besides the leading statesmen of the day the club comprised such authors as Steele, Addison, Congreve, Garth, and Vanbrugh. Of the many stories connected with the club and their meetings one alone must suffice. Hoadley, then bishop of Bangor, was a guest one 4th of November, when it was customary to drink to the "immortal memory" of William III. This toast fell to the not unwilling Steele, who had also to raise the more phlegmatic Addison to conversation pitch. John Sly, the hatter of facetious fame, approached the company on his knees with a tankard of ale to drink to the toast and to return in the same posture. Steele, seated next to the bishop, whispered him, "Do laugh, my lord; it is humanity to laugh," but, soon falling in Sly's own condition, he had to be put in a chair and sent home. Nothing would satisfy him but being carried late as it was to the bishop's house. The next morning his guest's displeasure was dissipated with the propitiatory couplet,

"Virtue with so much ease on Bangor sits,
All faults he pardons though he none commits."

In Shire-lane Sir John Sedley lived, and here his son the dramatic poet was born. Antony à Wood records his having dined with Elias Ashmole at his house by the "Globe." In making the foundations of the new buildings traces were discovered of the underground passages connected with the Bible Tavern at No. 13, which, ostensibly a printers' house of call, was a favoured haunt of the lawless,—chief amongst whom was Jack Sheppard, another of whose "flash kens," the White Lion in Wych-street, disappeared about two years since. They still show in the Black Jack, Portsmouth-street, the first-floor window through which he once jumped to escape Jonathan Wild. By a singular coincidence, the branch of the Bank of England in the Courts is believed to occupy the site of "Smasher's Corner" in Shire-lane, which took its name from the coiners who here pursued their nefarious calling. Shire-lane could also boast of the Anti-Gallican, frequented by sporting men, and kept by Harry Lee, whose diminutive son was the first of the tigers made fashionable by Lord Barrymore.

The Ship Inn in the yard of that name once belonged to Sir Christopher Hatton, and adjoined another, the Drake, dedicated to the great naval hero. In Bell-yard lived Fortescue, to whom Pope addressed many letters as "his counsel learned in the law." Blackstone and Franklin dwelt in the southern side of Carey-street, so named after a house there of Sir George Carey (1635). To bring down our account to recent times, it may be stated in conclusion that an old watch-box stood in Boswell-court not more than thirty years ago.

* *Temp.* Henry II. The well, with its pump, was at the southern end of Clement's-lane. The new Judges' Library occupies its site.

New Workhouse Infirmary for Stoke-on-Trent.—In consequence of the increased pauperism of the parish, the Board of Guardians have decided to erect a new infirmary at the workhouse, at a cost of 13,000*l.*

HORTICULTURAL BUILDINGS.*

The chief object I have had in view in preparing this paper has been to embody just that information and just those points relating to the construction of horticultural buildings which are outside the province of the gardener, and do not usually come within the knowledge of architects; in fact, to supply a few links which are generally missing between the architectural and horticultural interests.

I have no desire to discuss questions of architectural design or even many points of constructional detail, respecting which you probably know far more than I do. Neither do I wish to dilate upon the many methods of growing plants, fruits, and flowers; these questions we may safely leave to the gardener proper.

In order to start fairly, I will first of all draw your attention to the nomenclature of the subject. The words "hothouse," "greenhouse," "glasshouse," are so frequently used indiscriminately that a slight classification of these structures is necessary. I generally find they divide themselves into two classes, growing-houses and showing-houses. Growing-houses, again, divide themselves into three sections,—1st. Those in which plants are grown in pots on stages, or at a certain distance from the glass, comprising simple greenhouses, plant-houses, houses for bringing on bedding stuff, some descriptions of orchard-houses, and plant-stoves without bottom heat. 2nd. Houses in which foliage is trained along the roof, such as early and late vineries, muscat-houses, peach-houses, or similar descriptions of orchard-houses. 3rd. Houses in which root action is stimulated, such as cucumber and melon houses, pine, succession, and fruiting houses, pits with forcing or propagating beds, plant-stoves containing heated beds, &c.

Whatever classification, however, is used, must not be regarded as rigid; for these divisional sections will often be found to overlap each other. For instance, from the force of circumstances a general-purpose lean-to house may frequently be seen, in which cucumbers trained along the roof have their roots in a heated bed in front, and plants are grown in pots on a stage at the back. I shall confine my remarks chiefly to growing-houses, and then, if I have time, I will say a few words on showing-houses or conservatories.

Of heating I propose to say nothing. The subject, although closely connected with horticultural buildings, is such an important and a complicated one, that I could not possibly do justice to it in the present paper with the time at my disposal.

The peculiarly trying conditions under which horticultural buildings exist,—viz., the extremely varying temperatures of the inside and outside: the moisture-laden air of the former; the exposed character of the structures; the uncertainty of our climate; the necessity for durability, solidity, and yet the minimum of obstruction to light,—warrant every precaution being taken that the materials used be thoroughly sound; that the construction be such that there be no crevices for the retention of moisture or harbouring of insects; and that the buildings, by subsequent periodical painting and repair, be kept in a good state of preservation.

The first main point in connexion with a growing-house is to determine the pitch of roof most advantageous for various purposes. Now, I need not tell you that when the sun's rays strike a sheet of glass some of those rays cannot pass through. The more nearly sunlight strikes a roof of glass at right-angles, or within 30° of a right-angle, the less obstruction to the rays of light does the glass afford.

The next point is how to obtain the maximum impingement of the sun's rays at, or as near as possible to, a right-angle, for the position of the sun relatively to the earth is always varying. In point of fact, the sun on the shortest day, say Dec. 21st, with us in London, rises about 50° east of south, attains an altitude at twelve o'clock on that day of about 15° above the horizon, and sets about 50° west of south. On the longest day, say June 21st, the sun rises about 50° east of north, attains an altitude of about 62° above the horizon at twelve o'clock on that day, and sets about 50° west of north. You will therefore see that if we wish to build in the latitude of London a greenhouse of which

* A paper by Mr. F. A. Fawkes, read before the Architectural Association on the 8th inst.

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the roof shall receive the sun's rays at right-angles on December 21st, such roof would have to be built at an angle of 75° with the horizon; whereas, on June 21st, the roof would only have to be at an angle of 28° with the horizon.

If, again, for ripening purposes, we desire accuracy of the highest degree, and require the sun to strike a roof at right angles at twelve o'clock on any particular day of the year, and at any other place besides London, we only have to remember the following simple rule:—Take the latitude of the place, and from it subtract the sun's declination between the vernal and autumnal equinoxes; or to it add the sun's declination between the autumnal and vernal equinoxes, and we shall obtain the required inclination of roof. The "Nautical Almanack" gives the sun's declination for every day in the year. Of course exactly at the autumnal and vernal equinoxes, that is, when the planes of the equator and ecliptic coincide, the latitude of the place equals the angle which the roof must make with the plane of the horizon. An inclination of roof, however, founded on the astronomical problem alone, is only necessary when the sun's heat and light are required under the most advantageous circumstances, such as for ripening, on or about a certain date, fruit trained along the roof. In most cases, for plant and flower growing purposes, especially when pot plants require to be near the glass, a low pitch economises space and artificial heat, and is really found better suited than a higher pitch. In such cases 26 degrees to 30 degrees pitch is what I recommend. I never like a lower pitch than 26 degrees, or rain is apt to drift in under the laps.

Summing up the question of the best pitch of roofs in a few words, I may state that for plant-growing where low houses are required a roof of 26 degrees to 30 degrees is suitable. For fruit growing along the rafters, when the ripening process requires the maximum sun influence from 36 degrees to 44 degrees,—say a mean of 40 degrees,—and for wall fruit, where the glass requires to be as near the wall as possible, and a specially narrow house is advisable, 60 degrees to 70 degrees may be advisable.

So much for the pitch of roofs. We have not, however, done with the astronomical part of the question. Keeping in our mind the leading points connected with the sun, where it rises, where it sets, and the altitude it attains, we will pass on to the various forms of growing-houses, and some of the reasons for their assuming these forms.

The first and most natural form is the *lean-to*. This form is used under the following circumstances:—When a wall or building already exists against which it is desired to place a glass house; when a wall is specially built in order that a house or combination of houses may face the south and have a brick protection from the north; when the maximum length of rafter for vines or similar fruit-growing is required; when outhouses, potting-shed, boiler-house, gardeners' apartments, seed-room, &c., are required on the opposite side of the wall; and when, with a wall already existing, a house having a given area is required to be built at the smallest cost. Of course the best aspect for a lean-to house is to face the south. It will then catch a larger amount of sun than in any other position. Even when the lean-to faces exactly south, and the wall is consequently due east and west, part of the early morning and late evening sun will be lost, for the sun rises north of east and sets north of west during part of the year. Sometimes an existing wall against which it is proposed to build a lean-to does not face exactly south. You will then remember that by so much as the aspect of the wall deviates westerly, by so much do you lose the morning sun; and by so much as the aspect of the wall deviates easterly, by so much do you lose the afternoon sun. Again, it is as well to remember that in consequence of brick protection from the north, and glasswork facing south, a lean-to, other things being equal, is easier to heat than a house in which the glasswork is exposed in every direction.

The next form of house is the *span*. This form is used under the following circumstances:—When no high wall exists or is required; for building at right angles to and in combination with a range of lean-to houses against a south wall; when the minimum height is required, so that the houses may cause as little obstruction as possible; when comparatively small plants require to be accessible, and yet as near the glass as possible, and when, from local circumstances, this is not so easily effected in a lean-to house; when the sun's rays are required to reach all parts of a plant as much as possible; when great length of rafter is not necessary; and when the length of a house requires to be in the direction of north and south, and each side requires an equal amount of solar rays.

The best aspect for a span house is, of course, for the ridge to run north and south. In this way the contents obtain as perfect a distribution of the sun's rays as possible; for as the side facing east receives all the morning and part of the afternoon rays, so the side facing west receives part of the morning and all the afternoon rays. Frequently span houses are not built with the ridge running north and south. I have even seen them purposely built with the ridge east and west. In this way the side facing south will receive a much greater proportion of the sun's rays than that facing north, so that plants requiring different proportions of sun's rays can be grown in the same house.

The lean-to and the span are the chief simple forms to be met with in connexion with glass houses; but there is another,—a sort of compromise between the two, viz.,—the three-quarter span, which will be found very useful under the following conditions:—When the back wall of an otherwise lean-to requires to be kept as low as possible, so that without departing from the main features of the lean-to, the wall may form the minimum obstruction; when it is necessary to let light in at the back or for utilising early morning or late afternoon sunlight, which would otherwise be lost; and when the maximum length of rafter is not a *sine quâ non*.

It would be perfectly impossible for me to give you a résumé of all the combinations which can be constructed. It may be as well to bear in mind that when a number of houses are required, they should be planned so that they are compact, not straggling; so that the buildings for consecutive operations are as nearly as possible in consecutive order; so that the boiler or boilers are in a convenient position for the work they have to do; so that each separate building does not suffer from being in combination with others.

Very important points in connexion with planning horticultural structures are site and levels. The actual site may be, and frequently is, a matter of choice. When this is the case, first see that trees or other objects are not likely to obstruct the sun's rays and thus neutralise the advantages of your glass houses. Decide upon that site which will best suit the varied conditions of aspect, drainage, stoke-hole, furnace, chimney, potting-shed, fuel-shed, and other buildings, retaining a particular view, &c. Also, see if your ground is level; if it is not, ascertain the exact nature of the inequality. If the ground be fairly level in the direction of the length of your buildings, well and good. If, however, the ground fall in that direction, several courses are open to us. In any case, it is advantageous for the boiler to be at the lower end, when, in many instances, excavation for a stoke-hole may be entirely avoided. Even supposing the ground to be perfectly horizontal, the question of floor-levels must be considered. If there is a difficulty of drainage, or the boiler cannot be sunk as low as necessary, it is often advisable to raise the floor-level. On the other hand, it may be necessary to sink the floor-line below the ground-line, in order that the houses may form the minimum obstruction. In this case great care must be exercised in the drainage, or the houses may be perpetually flooded. It used to be the fashion, more than it is now, to sink houses in order to retain the heat, but with existing facilities for heating, such a course is now rendered unnecessary. These remarks regarding levels will equally apply to combinations as to single houses. Houses composing one range should, if possible, have their floors on the same level. Steps from one house to an adjoining one should be avoided; but, if necessary, parallel disconnected lines of houses may occupy different levels without inconvenience. In all cases there should be easy means of intercommunication between all houses for a wheelbarrow.

In constructing a glass house, several points thrust themselves upon us, especially with reference to the roof. Obstruction to the sun's rays must be avoided as much as possible, yet the structure must be durable and substantial, and lateral thrust must be avoided. The rafters should be sufficiently deep for the purpose, yet not so deep that the solar rays, especially when they shine obliquely, will be materially arrested. Under ordinary circumstances, for growing-houses a roof well tied with light iron tie-rods will enable rafters to be much shallower than a roof not so tied. As to whether the roof shall be made of framed lights or not, I may say from my own experience a sash-bar roof, with T-iron purlins between the rafters, is lighter, has less material, is not so liable to get out of repair by rotting, and, in fact, will answer every practical purpose for such houses much better than the heavier and more substantial sash roof. The advantages of a sash over a sash-bar construction are, that the roof can be practically stripped if for cultivating purposes. The maximum amount of air is required at any season; and also that the house can be taken down without the actual necessity of taking out the glass.*

* To be continued.

ST. OLAVE'S, JEWRY.

THE Ecclesiastical Commissioners are about to prepare a scheme which will involve the removal of yet another of Wren's City churches. St. Olave's, Jewry, conspicuous for the four obelisks crowned with balls and the staff carrying a gilded vane in the form of a ship upon its tower, was built in 1673 at a cost of 5,600*l*. The former church, in existence more than 500 years ago and long known as St. Olave's Upwell from a well at its eastern end, was burnt by the Great Fire. Here were buried, amongst others, Thomas Morsted, surgeon to the kings Henry IV., V., and VI., and sheriff of London, with Giles Dewes, clerk to the libraries of kings Henry VII. and VIII., and French preceptor to Prince Arthur and his younger sister Mary. In the Fire also perished the neighbouring Church of St. Martin in the Pomary or Orchard which stood on the eastern side of Ironmonger-lane, near the house of Sir Thomas Chitty, Lord Mayor. This was not rebuilt and the parish was united with St. Olave's. The name of the district commemorates a persecuted and long-suffering race who gathered here until their spoliation and expulsion from England by King Edward I. The church reminds us of an earlier and more dominant occupation, being one of the four in London that were dedicated to Olaf, or Olave, king of Norway, son of Harald Grinska, the hero of many valiant exploits in freeing his country from the Swedes and repelling the Danes from our own. A convert from paganism, he ultimately fell fighting against the rebel Thore Hund, at Sticklerstad, on the 31st of August, 1030, the cry of "Fram, Fram, Kristmenn Krossmenn Konungmenn!" on his lips. Enrolled amongst the martyrs and saints, his glorious end served the Faith he had espoused as much as all his previous efforts in behalf of Christianity. In his monograph upon the towers and steeples designed by Sir Christopher Wren, Mr. A. T. Taylor describes the tower of St. Olave's, Jewry, as consisting of four stories, containing, on the lowermost one, a square-headed door, with Doric side columns, entablature, and cambered pediment; the second story, he goes on to say, is pierced by a circular-headed window, and emphasised by a pronounced moulded string-course; the third contains the clock and case, with pediment over, and side consoles; the belfry-stage is pierced by circular-headed openings, edged with moulded architraves having centre and cross mullions, and filled in with louvres. Though St. Olave's possesses no architectural features of unusual merit, it contains the remains of two men whose association therewith it is to be hoped will not be allowed to perish. In the old church was buried Robert Large, a mercer, the master of Caxton; in the present church are the tomb and monument of John Boydell, to whose love and practice of art, coupled with a well-nigh prodigal liberality in encouraging and rewarding the labours of others, is due our modern school of historical painting and engraving. His greatest work was the employment of Reynolds, West, Fuseli, Northcote, and other artists, to paint pictures illustrative of Shakspeare's plays. The pictures were exhibited for some years at the Gallery, afterwards the British Institution, in Pall Mall. Boydell also published a number of large-sized prints from these compositions, together with a superb edition of the poet's

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works. In these and kindred projects for the advancement of pictorial art, he, with his nephew, Josiah Boydell, expended no less than 350,000*l*. But subsequent embarrassments, mainly owing to the outbreak of the French Revolution and concomitant interruption of traffic abroad, forbade the accomplishment of his original design to bestow his collection upon the nation. Within a few months of his death the pictures were sold, in May, 1805, at Christie's, realising, by reason of their abnormal proportions, a sum very incommensurate with their original cost or intrinsic worth.

Old Jewry was once famous for the stately houses built by Wren for Sir Robert Clayton, Sir Nathaniel and Sir Joseph Herne; here, too, lived William Sharp, the eminent surgeon, and Granville Sharp, the patriot. The synagogue at its northern end passed into the hands of the friars, *Fratres de Sacco*, and then was used as an official residence by several lord mayors. Degenerating into a tavern, it is mentioned in the inventory of "Innes for Horses seen and viewed" in preparation for Charles V. of Spain's visit to Henry VIII. *Kitely*, in Ben Jonson's "Every Man in his Humour," is a merchant of Old Jewry, and *Wellbred* in that play dates his letter to *Edward Knowell* "from the Windmill." The magnificent house in which Sir Robert Clayton, the "fanatick lord mayor," of Dryden's "Religio Laici," entertained King Charles II. at supper, was pulled down about twenty years ago. Here, as librarian to the London Institution, Porson died. Dr. James Foster,—the modest "Foster" of Pope's couplet,—had a chapel in Old Jewry; he owed his popularity to Lord Chancellor Hardwicke, who, stepping one day within the chapel to escape a shower of rain, was so well pleased with Foster's discourse that he sent all his great acquaintances to hear him.

NELL GWYNNE'S HOUSE IN WARDOUR-STREET.

The new street from Piccadilly to Bloomsbury will, in traversing Soho, pass over the site of a house which is probably the last in London that can with any certainty be pointed out as a home of Nell Gwynne. Standing then in Hedge-lane by the Military-garden, it is now No. 53, Wardour-street (until recently No. 38, Princes-street), at the south-eastern corner of Richmond-street. It would seem that Nell Gwynne lived here at some time within the interval 1667-1670, for in 1667 she was, as Pepys records, lodging in Drury-lane, and in 1670 inhabited a house on the north side of Pall Mall, next to Lady Mary Howard's. In 1671 she obtained under Act of Parliament a free conveyance of the house and site on the south side of that street, which she occupied until her death, in her thirty-eighth year, in 1687. This last-named house, adjoining the Countess of Portland's, was purchased by the Waldegrave family; its site is at present occupied by the more modern premises of the Eagle Insurance Company. Buried at St. Martin's-in-the-Fields, Tenison did not disdain to preach her funeral sermon, whilst the numerous London houses from Bagnigge Wells in the north to Sandford Manor, Fulham, in the west, that were associated with her memory, evince how strong a hold Nell Gwynne retained in the people's regard by her love of unaffected nature and fondness for their more harmless pleasures,—traits in her character but too commonly neglected. Those who delight in the trivial surprises of coincidence will find amusement in being reminded that the Thames at the eastern and western limits of the metropolis flows by the sites of two ancient palaces, at this day represented by national hospitals, designed by one architect, whereof the one is attributed to the large-hearted benevolence of this royal mistress, and the other testifies to the affection with which William III. cherished the memory of his consort, whose pity had been kindled on seeing the sufferings of the victors at Cape La Hogue.

Worthing.—A first-class club has just been established here under the auspices of the principal gentry of the neighbourhood. It joins the Royal Hotel, and is in a capital position. A fine billiard-room, 36 ft. by 25 ft., is being erected in connexion with the club from the designs of Mr. George Truefitt, under whose care important alterations and improvements are being carried out at the Royal Hotel for Mr. Young, the new proprietor.

EDINBURGH.

The new chancel of St. John's Church has been consecrated, and the effect of the alterations upon the interior can now be judged of. The church, as we formerly stated, had no chancel, the altar and table having been placed below the great east window of the nave. The head of this window now does duty as the chancel arch, and the chancel is projected in the form of an octagonal apse lighted by five windows, which are similar in character to, although better in detail than, those of the nave, which are of a later phase of the Perpendicular style. It is unfortunate that circumstances rendered it imperative that the chancel could not be carried further eastward, but, as it is, the improvement upon the interior is considerable. The removal of the organ from the west to the east end of the nave has opened up the arch into the central west tower, which greatly improves the perspective in that direction; and in the other, the abrupt termination has been modified by the new chancel. As regards the details, they have been carried out in a liberal spirit; the floor of the chancel has been laid with coloured marbles, and the steps are of polished white marble. The stalls are oak appropriately carved, and the ceiling is richly groined and coloured in keeping with the other decorations of the building. The central window of the chancel only is filled with coloured glass, the other four being left for future donatories. All the windows in the original structure were furnished with stained glass by Messrs. Ballantyne, and the new window, which is by Messrs. Clayton & Bell, presents a marked contrast to them, both as regards colour and design, affording an example of the change in taste in this particular.

St. Thomas's Chapel has been re-opened. Besides the new elevation towards Rutland-street, formerly referred to, considerable improvements have been effected in the interior. The two elevated structures which respectively served the purpose of pulpit and reading-desk at the west end, have been superseded by new furnishings, more in consonance with the present taste. The organ has been removed from the gallery at the east end and placed alongside the altar, where seats have been provided for the choir. The pitch of the galleries has been lowered, and the panelling in front improved.

At a meeting of the Town Council, held on the 5th of December, the Lord Provost gave notice of a motion that it should be remitted to a committee "to consider and report as to the most appropriate manner of recording the sense which the Corporation and people of Edinburgh have of the services rendered to the city by Dr. William Chambers, especially through the Improvement Act of 1866, and the restoration of St. Giles's Cathedral." No one now doubts the benefit which has accrued to the city from the improvements in question, both as regards the sanitary condition and amenity of the city; and it will be conceded by many enlightened citizens, that there is need of still greater improvements being carried out. Were a new scheme mooted, there would doubtless be strong opposition to it on the part of certain of the ratepayers, as there was on the former occasion, but if the like energy were displayed, a similar result would most probably follow. The restoration of St. Giles's is still in progress, but it is not in a state in regard to which anything definite can be said. The plans for the new chapter-house to the south-east of the chancel have been approved of, and to these we propose to refer on a future occasion.

The elevation of the new Conservative Club is now complete, with the exception of some slight details. The building forms a marked feature in the line of Princess-street, rising as it does to a height of 70 ft. The style adopted by the architect, Mr. Robert Rowand Anderson, is that which has been associated with the name of the brothers Adam, and it may be conceded that Mr. Anderson has given a fair interpretation of the style, but it can hardly be maintained that he has succeeded in producing an exterior capable of exciting admiration, except, it may be, amongst those precisians who delight in primness and propriety. We are given to understand, however, that it is to the interior that the supremest efforts of the architect are directed, and that it will vie with the interior of any other club in the kingdom as regards the artistic merit and richness of the fittings.

A new police-station and fire-station is to be erected at the West Port upon ground acquired under the Improvement Act. The designs will be carried out by Mr. Robert Morham, city superintendent of works.

The Edinburgh street tramways are not carried to the north of the city, on account of the steepness of the gradients, which, it is considered, it would be next to impossible to work by horse-power. Several efforts have been made to introduce steam traction engines, but any movement in that direction has been vigorously opposed. A movement is now on foot with the view of introducing a system to be worked by stationary engines and an endless rope. It is contended that street tramways of this kind have proved successful in certain American cities where the gradients are even steeper than in Edinburgh. So long as a system of this nature is carried out in comparatively straight lines and in wide streets, it may be worked efficiently without much injury to the neighbourhood; but where there are a multiplicity of narrow turns, or much private traffic, it is manifest that the difficulties increase. This point should be carefully investigated before active steps are taken.

A new Board School at North Merchiston is nearly completed. It is similar in scale and style to the other schools designed by Mr. Wilson, the architect to the Board, but it exhibits more spirit in grouping, and better character as regards detail, than his former efforts.

HALL OF THE AMBASSADORS, IN THE PALACE OF SEVILLE.

We illustrate in this week's *Builder* a work of Arabic art, which forms part of the Seville Palace, and which dates from the peaceful reign of Betis. Our engraving represents the hall in the edifice which was used for the reception of ambassadors. Almost every monarch of the Catalan and Spanish dynasties, from the period of the Conquest, left evidence of his love of art in this remarkable palace. According to extant trustworthy records, the palace was founded by the Moorish king Abdul-Hassis. It was restored by Don Fernando III. (the Holy), the conqueror of the city, and his son, Don Alfonso X. (the Wise). It was enlarged, and its preservation carefully attended to by Don Pedro I. (the Cruel), even amidst the sanguinary epochs of his turbulent reign. Subsequently it was restored by the Emperor Charles V., who here held his nuptials with Dona Isabel of Portugal. Next, in 1607, King Don Felipe III. caused to be constructed the "Apeadero," or Portico of Three Naves, supported upon marble pillars. Important alterations were made in the palace at the instance of King Don Felipe V., the founder of the Bourbon dynasty; and, finally, great care was bestowed upon its preservation by Queen Dona Isabel II. and King Don Alfonso XII.

The Hall of Ambassadors is one of the principal works of the palace. Gently curving arches of a collar shape rest upon marble monoliths. Walls covered with brilliant arabesques, and windows elegantly decorated, produce a beautiful effect. Moslem friezes remind us of the Koran, while the shields of Castille and Leon are emblems of the conquest. The doors are made of the imperishable wood of the larch tree. A cupola, which is a marvel of Arabic architectural art, surmounts the whole. In fact, the hall is said to be equal in colour and vivacity to the richest Persian tapestry embroidered in gold and silk. The history of Spain records a sanguinary scene enacted in this palace. Here died, by the hand of a king's archer, the Infante Don Fadrique, second son of Dona Leonor de Guzman, and brother to Enrique de Trastamara, who, a few years later, was destined to take away the crown and the life of his brother, Don Pedro I. of Castille, on the memorable field of Montiel.

The Alcázar of Seville, like the Great Aljhama of Cordova and the Alhambra of Granada, is regarded as one of the best specimens of the architectural taste and the artistic delicacy of the Arabs of the Spanish Peninsula.

Extensive Additions, Alterations, and improvements have just been completed to Brampton Brian Castle, Herefordshire, from the designs and under the direction of Mr. T. Nicholson, F.R.I.B.A., architect, Hereford. The works have been carried out by Mr. James Clutterbuck, of Gloucester.

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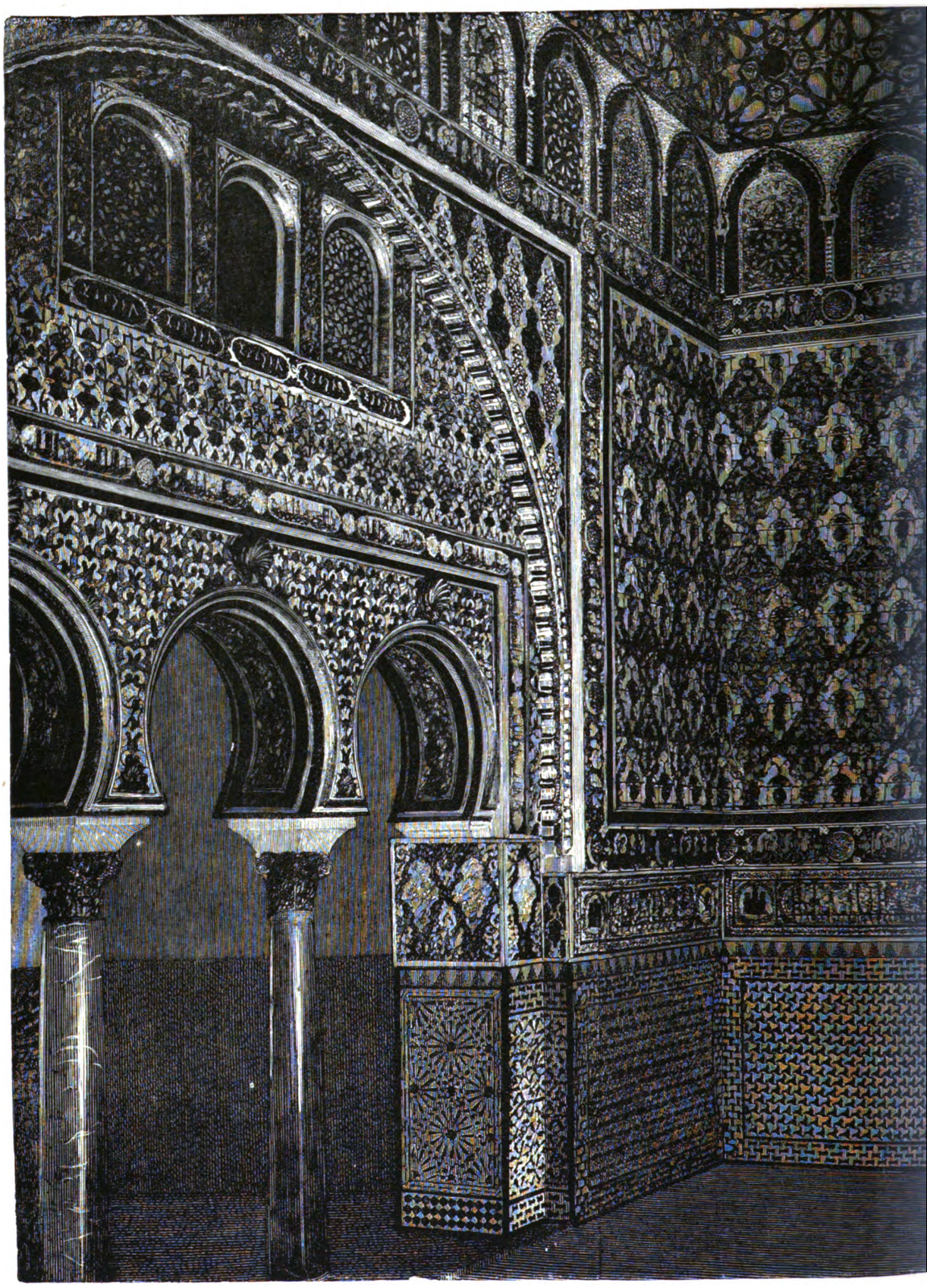

SALOON OF THE AMBASSA

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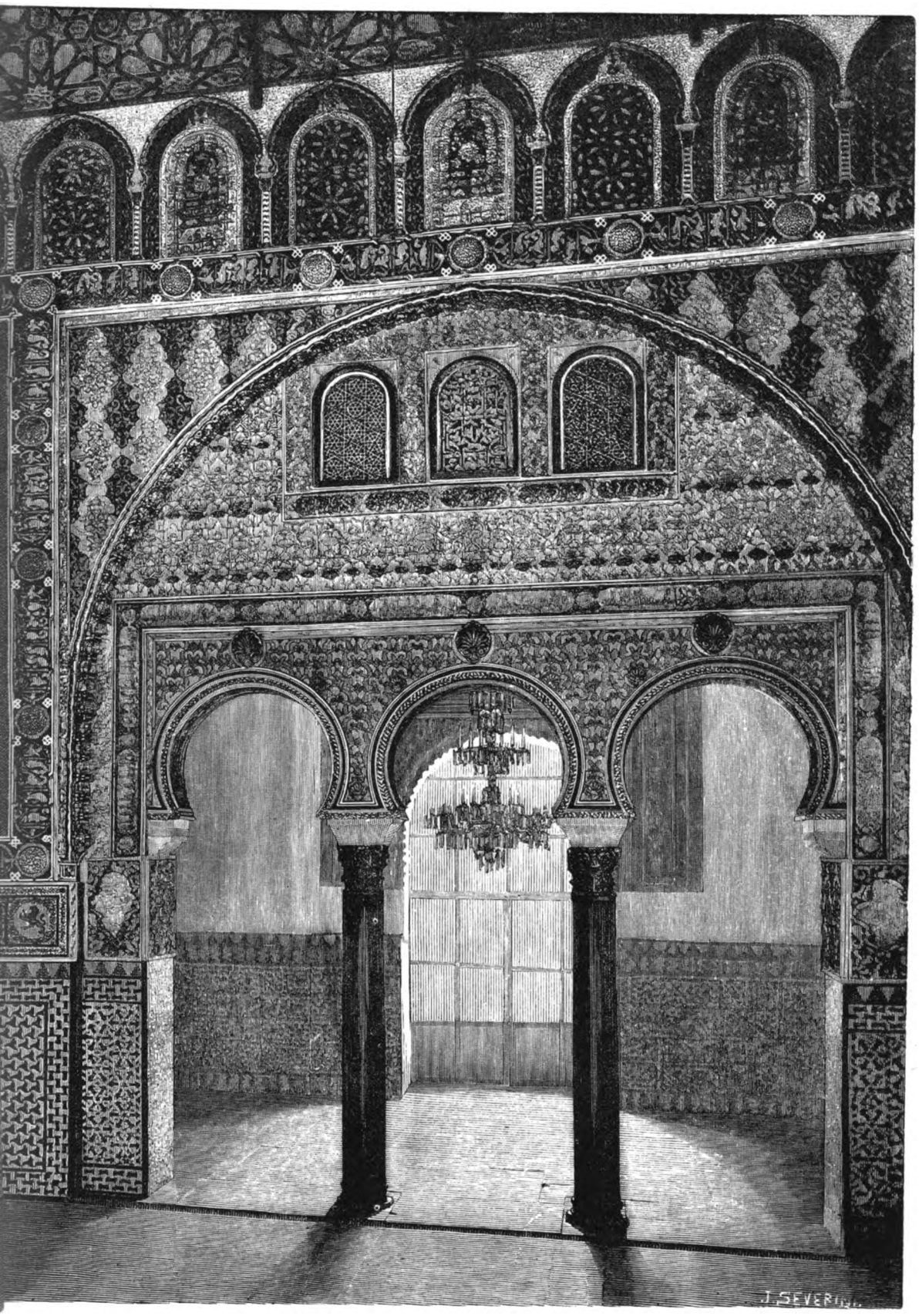

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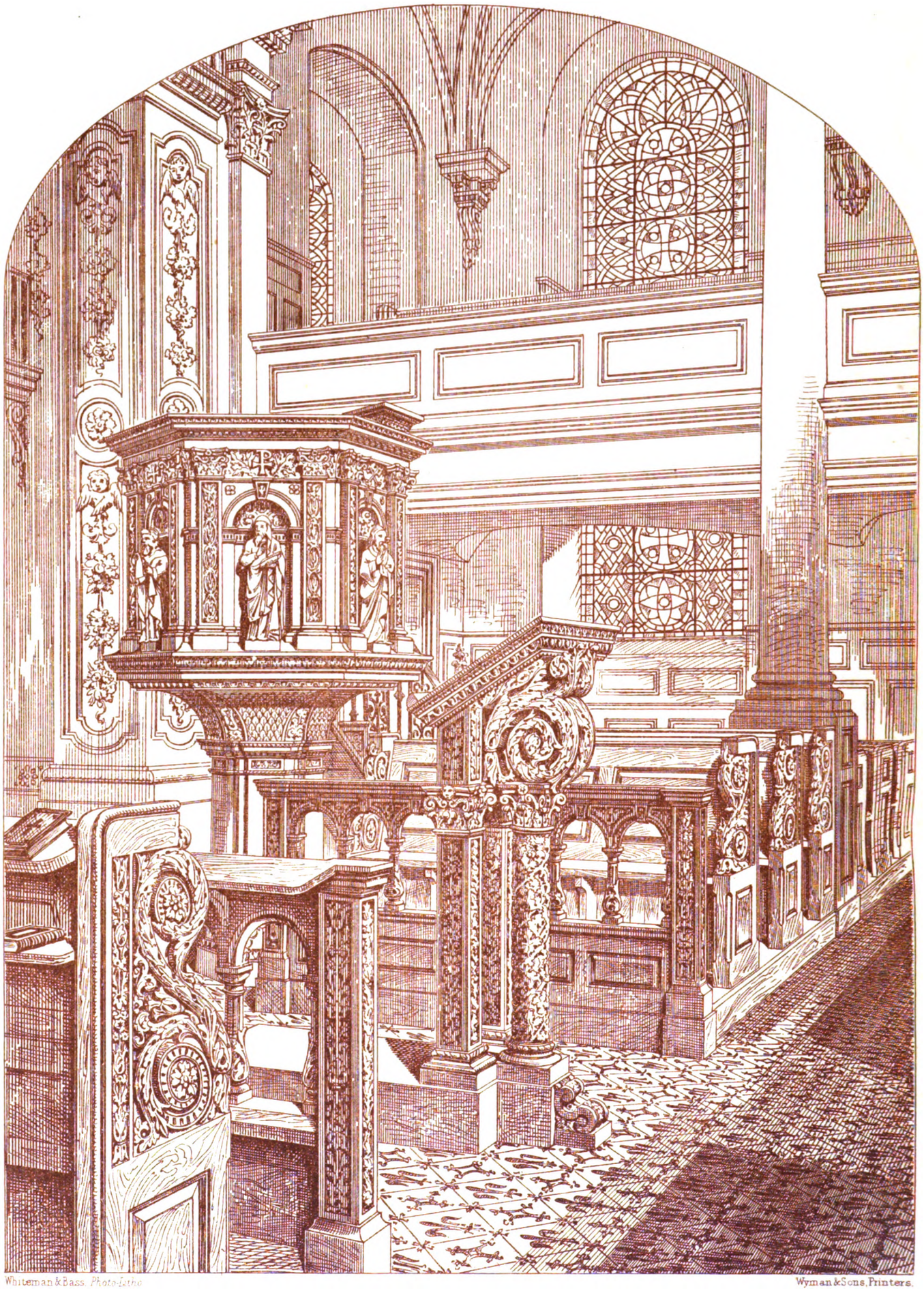

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ST. PETER'S CHURCH, VERE STREET, OXFORD STREET.

AS FITTED UP FROM THE DESIGNS OF MR. J. K. COLLING, ARCHITECT.

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STOKE GOLDING VICARAGE.—Mr. W. Bassett Smith, Architect.

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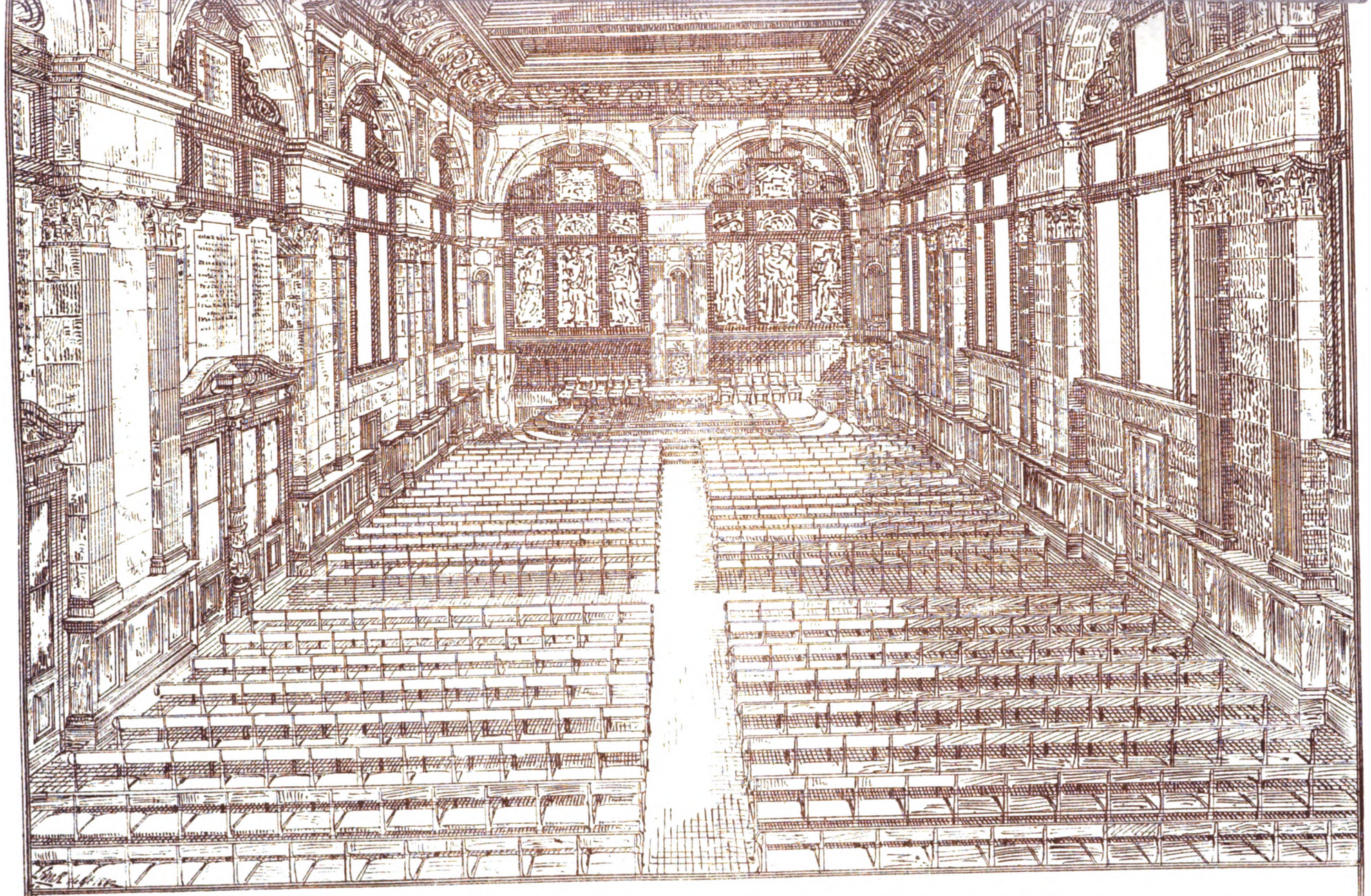

THE CITY OF LONDON SCHOOL: INTERIOR OF GREAT HALL.——Messrs. Davis & Emanuel, Architects.

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ST. PETER'S CHURCH, VERE STREET, OXFORD STREET.

THIS church, after having been decorated and reseated, was re-opened not very long ago, a notice of which we gave at the time.* We now give an illustration, showing the new pulpit, lectern, and choir-seating, as being specially worthy of commendation, from the careful manner in which they have been designed and carried out. The church being the work of James Gibbs, the architect of the Church of St. Martin-in-the-Fields, one of the primary objects was to keep the new seating and other additions in perfect accordance with the style of the church. In this the architect has been very successful, as the whole of the new work harmonises with the building itself most satisfactorily.

The new work is executed in oak, and the pulpit is hexagonal, the upper part being composed of niches, flanked by Corinthian pilasters, having Arabesque panels upon their fronts, designed from natural foliage conventionalised. The niches are filled with figures of our Lord, St. Peter, St. John, St. Paul, and St. Matthew, after those by Thorwaldsen in the Church of Notre Dame at Copenhagen, these examples having been adhered to by the special wish of the incumbent, the Rev. W. Page Roberts, M.A.

The very handsome lectern was the gift of the Lady Caroline Kerrison. The book-board is supported by a triple arrangement of one round and two square Corinthian columns, the shafts being covered with carved foliage; from these rises an elaborate double open-work scroll supporting the front of the book-board. The choir-seating has bench-ends, with open carved scrolls of elegant design. The type of work adopted in the carving has been mostly that seen in the oak carving of Grinling Gibbons. Nature has been freely resorted to, but rendered with that conventional delicacy which is characteristic of the best period of the Italian Renaissance.

The whole has been carried out, from full-size working drawings made by the architect, Mr. James Kellaway Colling, F.R.I.B.A., by Messrs. Cornish & Gaymer, of North Walsham, Norfolk, builders and architectural carvers, with the exception of the figures occupying the niches of the pulpit, which were the work of Mr. James Forsyth, the sculptor.

STOKE GOLDING VICARAGE.

STOKE GOLDING is situated about three miles from the town of Hinckley, in Leicestershire, with which it was formerly connected. It is now an entirely separate parish, and the present vicar has just erected the vicarage-house, a view of which we give.

The house is built with red bricks, and is covered with Staffordshire tiles. It contains drawing-room, dining-room, study, good entrance-hall, small parish-room, kitchen, and offices, and ten bed and dressing rooms; at the back there are a small stable and carriage-house, &c.

The works were carried out by Messrs. Fox Bros., of Atherstone, from designs by Mr. Wm. Bassett-Smith, architect.

The Church at Stoke is a very interesting fourteenth-century building, but is in a terrible state of decay. The chancel has, however, been entirely rebuilt, at the sole expense of the present vicar, in accordance with the old design, and every old stone that could be re-used has been replaced in its former position.

The Site of the Tuileries, Paris.—Says the Paris correspondent of the *Standard*, the question of what is to be done with the site of the Tuileries is being actively canvassed. It is generally agreed that it will never do to leave the ground vacant. To say nothing of the value of so large an area in the midst of Paris, some edifice, as a complement to the Louvre, and as a base to the immense perspective of the Tuileries gardens and the Champs Élysées, is held to be absolutely necessary. The *Paix*, the organ of the Élysée, insists that the obvious solution is to erect upon the ground "the palace of the modern sovereign,"—that is, a pile of Parliamentary buildings to accommodate both the Senate and the Chamber of Deputies.

* See *Builder* for 1881, vol. xli., p. 618.

THE NEW CITY OF LONDON SCHOOL.

WE give this week a view of the interior of the great hall of the new City of London School, on the Victoria Embankment. In vol. xxxviii., pp. 602-5 (May 15, 1880), we gave a view and four plans of the building as adopted for execution, a few minor deviations from those plans having been made in the progress of the work, such as the abolition of the compartments reserved for hats and cloaks in each of the class-rooms, and the provision of a large aggregate hat and cloak-room on the playground level. The only other deviation that need be mentioned is that the library has been made twice as large as at first contemplated by a re-arrangement of the class-rooms on the ground-floor. In vol. xlii., p. 495 (April 22, 1882), we gave some further particulars of the buildings, which were opened on Tuesday last by the Prince and Princess of Wales.

The City of London School was established in the year 1834, under a special Act of Parliament, by which it is endowed with an annual minimum sum of 900*l.*, payable by the Corporation out of the profits of certain lands bequeathed to the Corporation nearly 400 years before (viz., in 1442) by John Carpenter, Town Clerk in the reign of Henry V., for the purpose, as his will expresses it, of "finding and bringing up of four poor men's children, with meat, drink, apparel, learning at the Schools, Universities, &c., until they be preferred, and then others in their places for ever." The land so willed to the Corporation has long since been covered with buildings, and is situated in Tottenham-court-road, close to Chenies-street. The building in which the School has been carried on ever since its establishment is situated in Milk-street, Cheapside. It was built from the designs of the late Mr. J. B. Bunning, before his appointment as City Architect, on the site of Honey-lane Market, and the first stone was laid by Lord Brougham, in October, 1835. The position of this building is, we need not say, very confined. The superficial area occupied by it is only 9,000 square feet; it has no playgrounds, no adequate provision for natural science teaching, and no luncheon-rooms, while the general arrangements are, in some respects, below the standard now considered necessary even in primary schools. The constitution of the school has not greatly changed since the days of its establishment half a century ago. It is a *day*-school for the education of 680 boys between the ages of seven and nineteen. It is under the government of the Corporation, by a committee of that body elected annually. The Corporation has, for some years, paid an average of 4,000*l.* a year out of its corporate purse towards the maintenance of the school, instead of the 900*l.* a year which they are bound to spend under the Act before named.

One of the chief disadvantages hitherto suffered by the school arose from the old school building in Honey-lane Market being planned with a small number of large class-rooms, necessitating the teaching of classes numbering as many as sixty boys by one master. It is now generally held by educationists that a class of forty is the largest that can be effectively taught by one master. In the new buildings, therefore, an increased number of smaller class-rooms has been provided, and the staff of masters will be correspondingly augmented. While the old building has, owing to modern requirements, been getting more and more unsuitable for the purposes of the school, its site has become increasingly valuable as building land for warehouse purposes, it being in the very centre of what is known as the "Manchester trade." The Corporation therefore determined to erect a new building for the purposes of the school on a site an acre and a half in extent on the Victoria Embankment, and having instituted a competition, the plans sent in by Messrs. Davis & Emanuel were awarded the first premium, and those gentlemen were appointed to carry out the work. Subsequently, however, the plans had to be entirely recast, owing to changes determined upon by the Corporation in the method of laying out the whole area of the land formerly occupied by the gas works, and of which that appropriated as the site of the school formed a part. By these changes the frontage of the school towards the Embankment was reduced from 196 ft. to 136 ft., while, at the same time, the depth backwards was extended so as to make up the promised area of an acre and a half. The new site is an irregular oblong, having a frontage of 136 ft. towards the Embankment, and a return frontage of 430 ft. towards a new street running northwards from the Embankment to Tudor-street. The site becomes somewhat wider as it extends northwards, and is bounded on the east by lofty flank wall of the Royal Hotel, and on the back or north side by some vacant building land belonging to the Corporation next Tudor-street. A large portion of the site, including almost all the ground covered by the school building, being land reclaimed from the river, is stated to be free from all taxes and assessments, under the Act of Parliament of 7th of Geo. III., cap. 37.

The surface of the site of the building was entirely composed of "made" ground, and all the foundations have been carried to an average depth of 28 ft. below the level of the playground. Large rectangular holes were sunk through the made ground to a bed of Thames ballast which was met with at that level over the whole site, and which doubtless formed at one time a part of the bed of the river. The holes were then filled in with Portland cement concrete up to a level of 2 ft. 6 in. below the surface of the playground, so that the school-building may be said to stand on a series of concrete monoliths more than 25 ft. high, and ranging from 10 ft. to 15 ft. or 16 ft. square. According to a descriptive *brochure* issued by the School Committee, the bed of Thames ballast before mentioned is by no means thick, and an attempt was made in the first instance to reach, by boring, the London clay; but immediately beneath the bed of shingle there exists a bed of quicksand, which it would have been extremely difficult to penetrate. This quicksand, too, being below low-water mark, is always fully charged with water, and no risk to the building attends its existence unless in some future building or deep drainage works this quicksand should be cut by the excavations, in which case any heavy pumping would certainly cause risk of settlement to the school buildings, as well as to the Royal Hotel adjoining, the foundations of which rest on the same bed of ballast.

The whole of the floors throughout, except those to the porter's bedrooms in roof, are fireproof, consisting of Portland cement concrete, filled in between rolled iron joists spaced 27 in. apart from centre to centre. The lintels throughout are of rolled iron joists. A large amount of constructional ironwork in girders and columns has been employed at the level of the ground-floor, so as to avoid obstruction in the covered playground which occupies a large portion of the basement. The block-plan of the buildings is L-shaped. The shorter arm of the L, facing the Embankment, is three stories high, and contains large and lofty covered playground in basement, administration rooms and library on ground-floor, and the great hall on first floor, with its longitudinal axis parallel with the Embankment frontage. The longer arm of the L, facing the side street before referred to, constitutes the "teaching" block, and contains hat and coat room, dining-room, and covered playground in basement (all lofty and well lighted); eighteen class-rooms on first and ground floors; a natural-science school and lecture-hall, and two class-rooms, on second-floor, besides a common room on ground-floor for the assistant masters, a kitchen, and apartments for the resident porter.

The exterior of the façade towards the Embankment is entirely of Portland stone, with the exception of polished red granite shafts to the windows. It is in the style of the Italian Renaissance, enriched with carving and sculpture. The Embankment front of the building is 120 ft. long, and is three stories in height, with a flanking tower at each corner. The principal entrance is in the centre of this front, and is approached by a wide flight of stone steps from the Embankment. The basement story, half sunk beneath the level of the pavement, with open areas in front, has large segmental-headed openings filled with iron grilles enclosing the front part of the covered playground. The ground-floor has four three-light square-headed windows, two on either side of the principal entrance. The fenestration of the front of the first floor, or hall floor, consists of five large circular-headed windows, deeply recessed. The tympana beneath these arched heads are filled in with allegorical seated figures representing various arts and sciences, while the spandrels of the arches are separated by niches containing statues of Bacon, Sir

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Thomas More, Shakspeare, Milton, and Newton. These figures and statues, together with the spandrels containing shields bearing the arms of the principal donors to the school, were all executed by Messrs. J. Daymond & Son, of Edward-street, Vauxhall Bridge-road, under the direction of the architects, Messrs. Daymond & Son being selected, in competition with other artists, by the Building Committee. This selection has been amply justified by the excellence of the sculptural work. The general architectural carving has been well executed by Mr. G. W. Seale, of Brixton.

The façade is crowned by a balustraded stone parapet, above which rises the roof of the great hall, which, externally, is high-pitched and of French character, covered with green slates, surmounted by a lofty central *flèche* of copper work, and relieved here and there by dormers. This lofty roof has been avowedly made a marked feature in order to prevent the school building being altogether overpowered by its gigantic neighbour, the Royal Hotel. The roof is very strongly timbered, and is covered with green Westmoreland slates. The height of the hall from the floor to the springing of the roof is 40 ft. The roof is ceiled at a point 24 ft. above the springing, the timbers below the ceiling being cased with pitch-pine, stained walnut-wood colour. The principals are arranged in pairs, the tie-beams of each pair being made to range with the pilasters of the walls below. Each pair of tie-beams carries, at each end, a group of four columns, surmounted by an entablature, from which spring transverse and longitudinal arches dividing the roof into large compartments, in the manner shown in our view. It is, in fact, an attempt to treat an open-timbered roof in a Classic manner, and the attempt has been, on the whole, very successful. The hall is 100 ft. long by 45 ft. wide in the clear. The floor of the hall is of oak, and the walls are faced with Portland stone. What the acoustic properties of the hall may be we do uot know. The woodwork of all the lower portions of the hall is of American walnut. The large enriched cove just beneath the tie-beams is of *carton-pierre*, coloured to match the walnut woodwork, and has been executed by Boekbinder. The body of the hall is fitted with permanent seats to accommodate 816 occupants. These, with the additional seats in the gallery and on the daïs make up the total accommodation which the hall supplies to about 1,000. The seats in the body of hall have been specially made by the North of England School Furnishing Company from the architects' designs. The actual seats are balanced and hinged to fold back, so as, while accommodating the largest possible number, to leave free movement along the rows. Every alternate row of seats has a further movement by which the seat-back becomes a desk for the row of occupants immediately behind it. Thus for a public lecture the body of the hall will accommodate 816; for a writing-class half that number, 408; and for an examination, where more space is desirable, 204.

The principal entrance opens into a vestibule about 18 ft. square, and this gives access to the inner hall, about 40 ft. by 30 ft., but somewhat low for its size. The enriched plaster work in ceiling here and in other parts of the building was modelled and executed by Mr. E. T. Taylor. The floor is laid with a pavement of marble tesseræ designed in panels. On the right of the hall is the secretary's room, 22 ft. by 18 ft., and the committee-room, 22 ft. by 20 ft., both with windows overlooking the Embankment. Closely adjoining these rooms is a room for the secretary's clerk, a porter's room commanding the whole of the hall, a store-room, lavatories, &c. On the other side of the hall are the Head Master's room, 22 ft. by 18 ft., and the library, 45 ft. by 20 ft. All these rooms are 14 ft. 6 in. high. The fittings are in American walnut, and "Tobin" tubes are used as inlet ventilators, outlet ventilators close to the ceiling being connected with air flues in the walls. Facing the vestibule is the grand staircase, on the half landing of which is a central niche containing the statue of the founder, John Carpenter. This staircase is mostly of marble work, executed by Mr. George Mitchell, of Brompton-road and Upper Thames-street. This comprises some fine specimens of Greek green and red Devonshire columns at the foot of the staircase, with black plinths and Sicilian bases. The stone staircase is filled in with green serpentine, which is continued round the landings, and which forms the plinths for the black marble bases. This is grooved to receive the Sienna dadoing, on the top of which comes the moulded handrail of the stairs in Sicilian marble. The work reflects much credit upon Mr. Mitchell.

We have no space to give further details, for which we must refer our readers to the volumes already cited. We may say, however, that the arrangement of the laboratory and chemistry schoolrooms seems very good, complete provision being made by means of stink-chambers and stoneware sinks for carrying off all noxious fumes and products. The lecture-hall, 58 ft. by 48 ft., has a lecturer's table fitted with gas, water, pneumatic trough, and electric battery power, with a stink-chamber behind. Facing the table are ranges of steeply-rising seats and desks, tier above tier, accommodating about 300 boys.

The total cost of the buildings, including foundations and furniture, has been about 100,000*l*. The preliminary contract for the foundations, amounting to about 10,000*l*., was carried out by Messrs. Higgs & Hill. The main contract for the building was let to Messrs. John Mowlem & Co. (who have been represented in this work throughout by Mr. George Burt, jun.), for the sum of 76,000*l*. Messrs. Burt have also executed a large proportion of the fittings throughout. Messrs. Measures Brothers have supplied the wrought-iron girders, and Messrs. Rownson, Drew, & Co., the columns and heavy castings. The ornamental iron grilles at the front entrance doorway have been executed by Messrs. Jones & Willis, and the copper work of the central *flèche* by Messrs Holden & Co. Mr. D. O. Boyd has supplied his hygiastic grates for all the class-rooms, Messrs. Steel & Garland providing the grates for library and committee-room. The Coalbrookdale Company have been entrusted with the pillar lamps for the balustrade outside the principal front. Mr. Anderson provided and fixed the lightning conductors. Milner's Lock and Safe Company have supplied most of the locks and lock furniture. The School Committee obtained competitive tenders for and let separate contracts to Messrs. Herring & Son, of Chertsey, for the hot-water apparatus and fittings; Messrs. J. F. Clarke, for the gas-pipe-work and sunlights, cooking apparatus and fittings, and sundry gasfittings; Messrs. Strode & Co. and Mr. R. H. Hughes for the more important gasfitting; the North of England School Furnishing Co. for the desks and seats, not only of the great hall, as mentioned, but in the lecture-hall and class-rooms; Messrs. Story Bros. & Triggs for the general furniture; Mr. Laurie for masters' tables, blackboards, platforms, &c.; Messrs. Willis for organ; and Mr. George Spencer for the fitting-up of the gymnasium. Mr. Elsley's lever apparatus is used throughout for opening and closing the windows. Claridge's asphalte is used for covering the floor of the kitchen and of the corridors in the "teaching" block. The plumbing has been done by Messrs. Matthew Hall & Co. Jennings's valve closets, urinals, and tip-up lavatories are used in the administrative or front part of the building. The boys' latrines and urinals are placed on the playground level, well away from the main buildings, but are approached by a covered way. The urinals are fitted with Messrs. Bowes, Scott, & Read's automatic flushing tanks, and for the latrines Pearson's twin-basin trapless closets are used. The lift from kitchen to playground level (where there is a comfortable dining-hall for 200 boys) is by Messrs. Waygood & Co. The slatework throughout has been executed by Mr. Bingley. Minton's white glazed tiles are used for lining the walls of school corridors, while the walls of the covered playground, dining-hall, &c., in basement are faced with some excellent cream-coloured glazed bricks supplied by Messrs. Cliff & Co., of Wortley. The speaking-tubes and electric bells are by Mr. Wontner-Smith, of Finsbury-pavement. The stained-glass work has been done by Mr. Odell. The contractors have had a very efficient general foreman in the person of Mr. John Jackson, and the clerk of works throughout has been Mr. Charles Till, who acted in the same capacity at the new Natural History Museum, and to whose courtesy we are indebted for many of these particulars. The architects, as before mentioned, are Messrs. Davis & Emanuel, of Finsbury-circus, who, together with the Corporation and all concerned, may be congratulated upon the completion of this very important work.

THE DECORATION OF CLASSIC DOMES.

ST. PAUL'S CATHEDRAL.*

Though I did not take part in the discussion of Mr. Pullan's paper at the Royal Institute of British Architects on his proposed decorations of St. Paul's Cathedral dome, I have very strong opinions upon the subject, and I should be glad to say a few words on the general question at the present juncture, in accordance with Mr. Penrose's own suggestion at the meeting.

By the courtesy of Mr. Penrose and Mr. Stannus I have had the opportunity of seeing many of the various models and drawings prepared for this important work, and every one now knows the leading points in the late Mr. Burges's scheme. As an old friend of the late E. T. Parris, I sat by his side upon the little suspended platform from which he repainted, rather than restored, Thornhill's designs, and discussed the vexed question with him.

During one of my Italian tours some years ago, I made a special pilgrimage to Parma to see the painted dome of the church there, which drew from the great Titian the exclamation,—"If I were not Titian, I would be Correggio." And in the same journey I stopped at Padua to contemplate the mural decorations of Giotto's chapel, a remarkable example of flat treatment, the walls being divided into picture-panels by horizontal and vertical bands of coloured mosaics partaking of every tint of the pictures enclosed thereby.

The result of my observations has led me to formulate for myself certain principles, which, I think, should underlie any scheme for the internal decoration of domes, to some of which I will now draw attention.

1. In the decorative treatment of the smooth concave surface of a Classic dome, unrelieved by panelling, raised mouldings, or coffers, its constructional form should never be disguised by its painted or coloured ornamentation, but only emphasised, as were the best Byzantine examples, and notably St. Mark's, at Venice, wherein the old mosaic work forms a flat treatment in colour, enhancing its beauty, but not disguising its spherical charms.

2. It follows that the so-called architectural features in the framework of any decorative composition should only be admitted in so far as it would not be inconsistent to execute the same in the solid materials they affect, provided always that they are conceived in due proportion and in entire harmony with the general design of the building. It does not follow from this last proposition that it would be desirable to introduce architectural forms in coloured decorations,—quite the contrary; but obviously they are inadmissible if they do not conform at least to such normal restrictions.

3. The preservation of the apparent and real spherical form of the dome under decoration, and the limitation of architectural details to the development and not the disguise of that form, precludes the introduction of more or less solid-looking vertical divisions of the dome, broad at the base and narrow at the apex, apparently supporting the eye thereof, as Gothic ribs sustain an octagonal lantern, or flying buttresses support a Scottish crown; the blue colouring of the interspaces giving the impression that the dome is not a solid opaque body covering a vast circular area, but is open to the air like a bird-cage or a conservatory, except where the ribs occur.

The great majority of the old painters preferred to treat the whole dome as if it were not there; that is, as if the clouds had descended beneath and filled the temple with a beatific vision of the heavenly host in glory, or strove to represent the coming of the Son of Man and all the holy angels with him. The artistic beauty of the imaginary apotheosis condoned for its structural inconsistency, and of all methods of dome decoration it was ever the most popular, especially in the more emotional eras of religious art, of which Parma is a typical specimen.

4. If any evidence were wanting as to the disastrous impolicy of introducing architectural forms that are not helpful to the spherical idea, it is found in the necessity of representing these forms in false perspective, accentuated by still falser shadows on the under sides of cornices

* The following communication has been addressed by the writer to the President of the Royal Institute of British Architects, with an intimation that it would also be sent to the *Builder* for publication.

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and architraves, which, if constructed in real materials, would be the brightest portion, the light coming from below.

Impossible combinations of colonnades and pedimented compositions, with apparently projecting entablatures and ornaments of architectural details, round and square, recessed or perforated, are ostentatiously prominent in many of the designs I have seen, quite inconsistent with the fact that they are but painted decorations on a flat surface having no real relief at all.

Such misrepresentations of the conditions existing reduce the noble arts of architecture, painting, and sculpture to the level of ordinary theatrical scene-painting. But, says one, how comes it about that Thornhill's paintings, which are exemplifications of these defects, are, nevertheless, admitted by all parties to be remarkably successful? First, because the architectural framework of the pictures follows the lines of the general design of the interior, and the details are not absolutely inconstructible, grotesque as they are and would be under any circumstances. And, secondly, because of their indistinctness. The monotones in browns and greys used in these cartoons and their surroundings mingle with the murky atmosphere, and lend a dreamy dusky vision of an indistinguishable but well covered surface, the colour of which is not strong enough to upset the general effect of the hemispherical form of the mounting dome. Owing to this mysterious gloom, the dome of St. Paul's seems loftier than that of the brilliantly-illuminated and richly-decorated St. Peter's, of Rome. Had Sir Christopher Wren been unwise enough to have insisted on the bright colours being used which are now suggested, we should all have good reason to wonder how we ever admired what has really been the salvation of the dome as it is.

5. The last remarks point to a conclusion to which I have arrived with reference to St. Paul's Cathedral in particular, and it is this, that in a building intended only to be faced with white stone, and into which no coloured marbles were to be introduced, it is undesirable to decorate the roofs in very bright colours. And if the various concave surfaces of the domical ceilings, which were originally finished in plaster, in preparation for a painted decoration, had been all covered with sepia pictures like the central dome, a very rich and harmonious effect would have been produced without the introduction of any positive colour at all. The quantity of dark wood-carving in the choir would nevertheless have warranted the employment of any amount of colour in the choir; but the nave and transepts would have been finished satisfactorily without it, and such a scheme would have had my preference.

6. As, however, it is an apparently settled thing that bright colours are to be introduced, of which the key-note has been given by the mosaic pictures which have been successfully applied to the pendentives of the dome, it is obviously desirable to complete this first series of pictures, and to support them by the introduction of coloured marbles into as many pier and wall panels as possible throughout the building. Then would there be no incongruity in lining the coved or concave roof surfaces in coloured mosaics, and even with gold grounds; or they might be painted; each shallow dome being the subject of a single picture, the breadth and scale of which should be in harmony with the massiveness of the surrounding structure. This done, the base or drum of the great dome would come in for treatment in mosaics. A series of colossal figures in coloured mosaic in a gold ground, moving in processional order, as it were,—a glorious gallery of Biblical heroes and heroines. But I think we should have arrived at this point in the decoration of St. Paul's before we attempt to blot out for ever the now historical pictures of Thornhill. Let us proceed with the decoration of that which is not decorated before we expunge the only decoration we have. As Mr. Seddon suggested, let us try our 'prentice-hands on the minor and more manageable domes, and so make the culminating glory of the central dome the ripest, richest fruit of our labours and foregoing experiences.

7. The application of the foregoing principles to the decoration of the great dome itself, has led me to the conclusion that with brighter colouring, simpler treatment will be needed to obtain the breadth and harmonious effect required, and to avoid intricacy of details and spottiness in places. There should be no vertical ribs, but there will be bands of many colours forming a framing for the pictures, if it be deemed essential that the dome should be split up into several separate pictures instead of being treated as one grand composition.

Omitting the ribs, Stevens's general framework and architectural accessories are far in advance of any other proposition for the reception of more than one picture. But a more careful study and classification of the existing mosaic work of early date, at Ravenna and elsewhere, would be interesting and suggestive. The introduction of mosaics in the pendentives comparatively near the eye, almost enforces their introduction in the dome, and if they are not too smoothly laid the light will play over the whole surface without creating that blinding glaze which all smooth surfaces yield, causing a picture to be only capable of being seen in one position.

Adopting mosaic as the inner lining of the dome, and employing light reflecting colours for subject-figures and flat foliage and fretwork of the enriched borders and framework upon a rich gold ground, a grand and noble character may be given to it, equal in beauty to anything anywhere, with the assistance of masters such as Leighton, Poynter, and Penrose.

EDWD. C. ROBINS, F.S.A.

THE DECORATION OF ST. PAUL'S.

SIR,—As you published in your last number a simple *précis* of my paper on the decorations of St. Paul's, but gave Mr. Stannus's written reply in full; as that reply is based on certain statements which he alleged were made in my lecture; and as that lecture will not be published *in extenso* for many months, and consequently those of your readers who were not present will have obtained but a one-sided view of the matters in question,—I ask you, in fairness, to allow me a little space in your columns for the purpose of correcting some errors and refuting some imputations contained in that reply.

When stating that the sub-committee had decided not to employ an architect to make designs for the decoration of the dome, I made use of the words,—"Having repudiated architects' designs." Mr. Stannus, professing to quote my words, omitted the final word "designs" altogether, and went on to say that I was wrong in stating that the sub-committee had "repudiated architects," as Mr. Penrose and himself were employed by them. He then made the following quotation from the report of the sub-committee, which fully corroborates my statement:—"Although the adoption of Mr. Stevens's design as a basis for their operations will enable the committee to dispense with the services of an architect for the purpose of furnishing designs," &c. As Mr. Stannus was aware that the question was about designs, he was guilty of something more than garbling a quotation.

Had this been his only fault, I should not perhaps have taken the trouble to correct it, had he not afterwards brought a serious imputation against me personally, which nothing can justify. A mere perusal of the following extract from his paper will show the unjust nature of his insinuation:—

"Mr. Pullan had spoken of the sub-committee 'further strengthening their position' by forming 'an' alliance' with Sir F. Leighton and Mr. Poynter. To any one who knew the chivalrous honour of Sir F. Leighton and of Mr. Poynter, and who knew the sub-committee, it was astounding that such an imputation should be made."

I have to learn, sir, that the word "alliance" signifies a union or agreement in any way dishonouring to those who enter into it. Kings, states, and great men form alliances. I considered that the word alliance rendered more fully the sort of agreement by which the distinguished artists consented to make some pecuniary sacrifices for the object they had in view, in common with the committee,—that of advancing the solution of that great art-problem, the decoration of St. Paul's.

I believe these two gentlemen, and also most of the members of the sub-committee, know enough about me to believe that I should be one of the last persons in the world to use the word "alliance" in the sense to which my opponent endeavoured to twist it.

What makes matters worse, Mr. Stannus came to me privately, after the lecture, and said he withdrew what he had said about alliance, yet he allowed his paper afterwards to be printed without expunging the paragraph which he retracted. This was, to say the least of it, disingenuous. There are other points in his paper which require rectification, but I only trouble you with these imputations, which I feel bound in honour to refute.

R. P. PULLAN.

PRIZE-DISTRIBUTION AT THE ROYAL ACADEMY.

SIR FREDERICK LEIGHTON presided on Saturday last at the distribution of prizes to the successful students at the Royal Academy of Arts. The Creswick prize, 30*l.*, was gained by R. O. Rickatson, Herbert Lyndon being *proximé accessit*. For cartoons of a draped figure, Bernard E. Ward took the silver medal and 25*l.*, Margaret Dicksee taking the extra silver medal. Horace B. Fisher took the first Armitage prize, 30*l.*, and bronze medal; Mary Drew a prize of 40*l.* for the fresco design, an allegorical illustration of music; William Carter won 50*l.*, first prize, for six drawings from life; Henry Alfred Pegram took the first prize of 30*l.*, for the model of the Good Samaritan; R. T. Fallon, 50*l.*, for three models from life; William G. B. Lewis, a travelling studentship of 60*l.*, for architectural design for a public library.

The President, before distributing the prizes, delivered a short address to the students. He was happy to say that, saving perhaps in one class, the general impression the competition had this year on the minds of the Royal Academicians was a very gratifying one. The general average had certainly not fallen below that of other years, for they had felt justified, in three distinct competitions, in giving an additional award. The first of those competitions was that for the Creswick prize, in which there were several works of considerable excellence. Being a money prize of fixed amount, they could not, of course, increase or double it. They had, therefore, reserved an honourable mention, as *proximé accessit*, accompanied by a document which the student might take home as a token of his honour. The second award had taken the shape of an additional medal in the unusually large competition for the cartoon of a draped figure; while the third award was to the architects, in the shape of a third medal, in the class of drawings from an existing building,—a competition which this year had very marked excellence indeed. Amongst the other competitions, probably the most remarkable was that of drawing from the life, a competition which was very numerous, and which abundantly justified this year the third prize destined for it. For the competition of painting from life he regretted to say that the number of works was more limited than he liked, whilst he did not think they could be said to rise above the average in merit. At the same time, the increased scale of several of the studies deserved a word of special commendation. Sir F. Leighton added:—I cannot too strongly impress upon you this year, as on former occasions, the great value and importance of carrying out your studies on a large scale. Whatever the scale at which it is your intention eventually to work, you will always be gainers by studying, in the first instance, on a large scale. In sculpture, also, we see in a very distinct manner the benefit of the new school; but I grieve to say that the pleasure with which I should otherwise have made this announcement is very considerably dashed and marred by the thought that the gifted youth to whom the second award has fallen has been snatched away from us on the very threshold of a bright career. David Wade has ceased to live, and a wreath of *immortelles* hanging in front of his successful work is a token of the respect and esteem of his fellow-students,—a feeling in which his elder brethren in art join heartily and sincerely. A prize has also been given in the class of designs for a fresco for a public building; but I regret to say that the much-coveted satisfaction of giving the higher award,—the highest honour,—of execution under the auspices and at the expense of the Academy, is not yet conceded to me. I may be permitted to say, however, that few things would give me more sincere personal satisfaction than to make that award from this place, and I hope you will not long withhold it from me. I have said just now that in one class the average is not fully reached,—that class is the competition for the Armitage Prize, in which the drawings have fallen below

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the standard which we hoped and expected of you. I the more regret it on account of the great importance of the qualities to foster which chiefly that prize was called into existence, I mean the qualities of dignity and style in form and in competition. Now, these qualities are much lacking in the designs sent in; and, indeed, to speak for myself personally, it seems to me that the lack of these particular qualities is the predominant feature in all the designs and work sent in this year. The want of it is felt in the designs for the fresco for a public building; and careful, meritorious, and good in other ways as are the designs of the cartoons for the draped figure, in which categories these two prizes have been given, nevertheless they lack that style, that nobility of form, and that elevation of character which are specially and peremptorily demanded. This is not the time, of course, to dwell at any length on this point, but I could not do less than allude to it, and I must urge you to pursue it yourselves. To aid you in that pursuit I will further and finally advise you to study constantly and with unwearied admiration the work of the greatest master of style which these shores have produced,—I mean John Flaxman.

The prizes and medals were then handed to the successful competitors.

No day could have been more unfortunate than last Monday for exhibiting the Academy students' designs to the public. Fog darkened the air so much that clear sight of the works was impossible during great part of the day. Owing to this we must express rather doubtfully an opinion which, under a better light, we might, perhaps, have felt justified in expressing more decisively, viz., that the award of the Creswick prize for landscape is questionable. The landscapes were hung in the first room, which, for some reason, is one of those which has least light in it, and the subject for the Creswick prize being an evening one, it was difficult to see into the pictures at all. But the painting by Mr. Rickatson, to which the first prize of 30*l.* was awarded, though a highly finished painting, and bearing a look of completeness and mastery of the tools more decidedly, perhaps, than others, struck us as hard and mannered, and somewhat artificial in its effect. The painting by Mr. Lyndon, to which the compliment of *proximè accessit* was given, seemed to us decidedly the best and most artistic in feeling; there was less of paintiness and less of manufactured effect in it. The landscapes on the whole were of a good average. The second room contained competition designs for oil-painting of heads, and for architectural drawing. The arrangement of the architecture was somewhat confused and divided; as far as one could gather from the not very explanatory wall-placards, there are three prizes or rewards for architecture, one for drawing, one for design, and one for drawings from existing buildings. The architectural drawings in Gallery II. were weak, on the whole; some of the heads very good and forcible. The prize was gained in this group by Mr. Carter, who also took the prizes for the painting of a figure from the life, for the drawing of a figure from the life, and for the set of six figures from the life. As far as execution goes, Mr. Carter is evidently a coming man. The sculpture was arranged in Gallery IV. It consisted of designs of a small group of two figures, of which a good many had been submitted, and of sets of three single figures from life, various subjects. Some of the sketches gave evidence of feeling and power of expression, though slightly executed. The larger figures showed some fine modelling, but we have seen better and more forcible things in one or two recent years than any we noticed in this year's sculpture design. The long gallery was occupied at one end with the full-sized crayon studies for a draped figure, the subject being Penelope bringing the bow of Ulysses to the suitors. Of these the prize drawing by Mr. Ward was so completely the best that the rest were by comparison nowhere, this being the only one which realised anything of the dignity of carriage and manner which should belong to Penelope. The other drawings were more or less meritorious as drawings, but utterly futile as conceptions of the subject. The sketches for the Armitage prize, which is given for the best monochrome study for a picture, were ranged down the wall of the same gallery, and formed a rather interesting, not to say amusing, collection. The subject was a certain abduction of brides mentioned in the history of the Israelitish nation in the Old Testament; and the various views of the designers as to the way in which the young women may have regarded the matter formed a curious medley of interpretations of the same idea. Some of the studies showed great force and spirit, and the first prize was rightly bestowed on the sketch by Mr. H. B. Fisher, a group showing energetic action and very clever foreshortening, though in this, as well as in some others, it may be said that force rather than delicacy was shown in the treatment of a subject in which it was very easy to fall into something like vulgarity. We should have preferred to see a subject which would have led to the illustration of a rather higher element in human nature and manners than a tussle for the possession of women (which is about what it amounts to), more especially as dignity and refinement of feeling seem exactly the qualities in which these student productions are most deficient. The original architectural designs were not very much; architecture, as far as we have observed, has never been very forward at the Academy; but the sketches from actual buildings made by the present travelling student, whose name we did not see appended anywhere, were very good. The travelling studentship this year is given to Mr. William G. B. Lewis, for a design for a public library, fairly good, but not showing any very marked character. Several coloured drawings for lunette designs for execution in fresco, as decorative painting, showed very good intentions and a good idea as to the right sort of thing for this class of work; that by Miss Drew, which was undoubtedly the best, had the prize. The President holds out hope of the higher honour of the execution of a student's design of this class, at the expense of the Academy, whenever one shall be produced of a sufficiently high class to justify this. The array of life studies, occupying two rooms, showed a remarkable amount of good work, on which the Academy may well look with satisfaction as an evidence of the spirit and diligence with which a large proportion at least of the students are working at this foundation of picture-making.

FROM HOLBORN TOWN-HALL TO THE ANGEL.*

A STRANGE interest hangs around the line proposed to be taken by this new route, because for centuries previously to the erection of the houses now proposed to be demolished, the ground on which they now stand was one of the favourite places of recreation for the London citizens. Fitzstephen, writing nigh seven centuries ago, tells us that on the north side of London there were fields for pastures and a delightful plain of meadow-land, interspersed with flowing streams, on which stood mills whose clack was very pleasing to the ear, and, moreover, that the spot abounded with springs and wells, frequently visited, as well by the scholars from the schools, as by the youth of the City, when they went out to take air in the summer evenings. In those days the clustering vintage hung in purple glory on the slopes of what is now called Mount Pleasant. Ay! and on the brow of the opposite hill had not my Lord Bishop of Ely his strawberry-garden? And did not a successor of his add a vineyard and an orchard, extending from Holborn to Hatton-wall and from Saffron-hill to Leather-lane?

In our imaginary journey, leaving the Town-hall, we pass through a network of dismantled houses and slums into Red Lion-yard, appertaining to the Red Lion in Warner-street. Would-be travellers to the North, consulting the *Daily Post* of May 18, 1737, read, "For York, Newcastle, or Edinburgh, a good coach and six able horses will set out from the Red Lion, Cold Bath-fields, near Gray's Inn-lane, on Friday next, the 20th inst." Doubtless, among the frequenters of this tavern was Henry Carey, best known to the general world as the author of the words and music of "Sally in our Alley," and the writer of the burlesque, "Chrononhotonthologos." Though unhappy at heart, he was a jovial companion. In a fit of despondency he committed suicide at his house in Warner-street on the 4th of October, 1743. Only a single halfpenny was found in his pockets after death. Warner-street was named after Robert Warner, of Lincoln's Inn, esq., the partner of Walter Baynes, of the Middle Temple, gent., who let to Oliver Humphreys, clothier, "All that messuage or tenement commonly called and known by the name or sign of Sir John Oldcastle, together with the gardens and grounds thereunto belonging." The site of the tavern is covered by the south-eastern corner of Cold Bath-fields Prison. Humphreys turned the gardens into a place of public entertainment. Many advertisements are extant in reference to them. *Daily Advertiser*, August 4th, 1744,—"Sir John Oldcastle's, near Cold Bath-fields. The gardens are greatly enlarged, the liquors of all kinds the best. The music begins at five; the lamps are lighted at seven; and the whole concludes at nine." On the 17th of July, 1746, it is announced that "A Concert of Vocal and Instrumental Music will take place. The vocal parts, with the following songs by Mr. Blogg, viz., 'Come, Rosalind,' 'Observe the Fragrant Blushing Rose,' 'The Happy Pair,' and, by desire, a song set in praise of his Royal Highness the Duke of Cumberland, set to music by Mr. Handel." Could this last-mentioned song be, "See the Conquering Hero comes," written to celebrate the victory gained by the Duke at Culloden, won exactly three months previously? Time is the winnower who divides the chaff of notoriety from the wheat of true fame; "Mr. Blogg" is forgotten; "Mr. Handel" never to be. Perhaps George Frederick Handel might on this special evening have visited the gardens, for he was a member of a certain club, "The Small-coal Man's Music Club," in which he played the harpsichord to the brilliant assembly of dukes and duchesses and lesser nobilities, who thronged to the transmuted stable in which the concerts were held; the conductor, as every reader knows, being Thomas Britton, the concert-room being at the south-east corner of Jerusalem-passage.

The already-mentioned Walter Baynes in 1697 discovered a spring on the portion of the Jervoise estate which he had just purchased, and he laid out 3,000*l.* in erecting baths to utilise it. In 1697 he advertises,—"At the lower end of Gray's Inn-lane, in Sir John Oldcastle's field (Cold Bath-square), near the City of London, is discovered a spring of the nature of those famous cold baths St. Winifred in Wales and St. Magnus in Yorkshire, being approved of by several physicians conversant in the virtue and uses of cold bathing. There is a convenient bathing-place erected and a house built over it for privacy." The advertisement concludes, "Mondays, Wednesdays, Fridays, and Saturdays are appointed for men, and Tuesdays and Thursdays for women." The charge for bathing was 2s., and 2s. 6d. in the case of patients who from weakness had to be lowered into the bath by "the chair." Hatton, in his "New View of London," 1708, writes,—"The most noted and first cold bath about London was that near Sir John Oldcastle's. . . . . which they say is good against rheumatisms, convulsions in the nerves, &c., but of that those who have made the experiments are the best judges." Hatton hazards no opinion of his own in this case, nor does he when he speaks of an opposition bath opened in Southwark in 1705,—"Here are eleven crutches, which, *they say*, were those of persons cured by this water."

Baynes died in 1745, leaving his name in Baynes-row or Baynes-street. The row, which was commenced about 1737, lies between the Prison and Cold Bath-square. It leads into Cobham-row, so named in honour of "the good Lord Cobham,"—Sir John Oldcastle. The Cobham's Head,* facing the site of the Sir John Oldcastle, was a famous place in its day. The public are informed by the *Daily Courant* of April 20, 1728, that "My Lord Cobham's Head, against Sir John Ould Castle's, is lately opened, and the house and gardens are made very handsome and compleat, with a fine canal stocked with very good carp and tench, fit to kill. And any gentlemen are allowed to angle for their diversion. There are very good lodgings to be lett, where gentlemen may board if desired." Is it possible to fancy some worthy citizen of credit and renown taking up his fishing quarters for a season at "My Lord Cobham's Head," to save himself the trouble,—it could not be the fatigue,—of walking from Wood-street or the Poultry! A writer in the *Daily Advertiser* 140 years ago mentions that "he called at the Lord Cobham's to drink some of their beer, a tankard of which is 3d."; and that he "afterwards

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* See p. 681, *ante*.

* At this date there was another "Cobham Head" in John-street-road, now known as the "Adam and Eve." It had large gardens attached to it. (Roque's Plan.)

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walked in the garden, when he was greatly surprised to find a very handsome grove of trees with gravel walks, &c." These trees and walks, and also the canal, are delineated in Roque's plan. The fire station at the top of the row covers a portion of the old tavern and grounds.

At this point the line crosses what was formerly called Coppice-row, but why so is doubtful, and entering the north-west corner of Exmouth-street cuts through John-street, Tysoe-street, and Rosoman-street, towards the drinking-fountain in the wall of the New River Works, at the head of Garnault-place.

It was not till 1818 that the houses which formed Exmouth-street received their name from Nelson's "Fighting Pellew." The southern side of the street was erected by Thomas Brayne, of whom little is known beyond that he was lessee of the ground. "Braynes-row, 1765," is cut on a stone tablet on the front wall of one of the houses. Brayne's property formed a portion of Spa-fields, named after the London Spa, a place of entertainment somewhat resembling the Cobham Head and the Sir John Oldcastle. A glimpse of its character may be got in a rhyme in "Poor Robin's Almanack" for 1733:—

> "Now sweethearts with their sweethearts go
> To Islington or London Spaw.
> Some go but just to drink the water;
> Some for the ale, which they like better."

A public-house that marks the site of the Spa still retains the name.

Thomas Cromwell, the historian of Clerkenwell, writes, in 1828, "The water [of the Spa], which is a chalybeate, is now lost; though it was obtainable about eighteen years ago by means of a pump remaining in the cellar of the house in question." Of the potency of the ale, we read that, "On Sunday, a Custom-house officer, being intoxicated with Spau ale, in a phrensical fit drew his dagger, and fancying all people that passed to be his enemies, cut and slashed several persons in a most frightful manner; for which, being apprehended, he was carried before a justice of the peace and committed to the New Prison. This prison faced the Bridewell Prison,—now the House of Detention. From the back of the Bridewell a path led northwards into the fields known as Bridewell-walk. On the west side of this walk, in 1756, Mr. Rosoman, the builder and proprietor of Sadler's Wells theatre, built "a range of good houses," to which he gave the name Rosoman-row, now Rosoman-street.

Of Garnault-place there is nothing to say beyond that it was so named after its builder, a worthy treasurer of the New River Company, and that for some time it was the abiding-place of "everybody's Joe,"—Joseph Grimaldi; and that, as J. T. Smith informs us, in his "Vagabondinia," "Priscilla, a blind inhabitant of St. James's, Clerkenwell, was wont to be seen in the summer time seated against the wall of the reservoir of the New River Waterworks, Spa-fields, employed in the making of patchwork quilts. She threads her own needle, cuts her own patches, and fits them entirely herself."

It is not here requisite to tell the story of Sir Hugh Myddelton, or that of New Tunbridge Wells, better known as Sadler's Wells. Passing between the waterworks and the theatre, the new line, after a course of little interest, reaches the world-known Angel.

THE COMMISSION QUESTION.

THE Chiswick Improvement Commissioners have settled the vexed question of commission on the superintendence of making up, under the 150th section of the Public Health Act, of private streets, which has recently engaged the attention of various local authorities in the country, but specially in the suburbs of London, where land is being rapidly built upon and where many new streets are being formed. About four years ago the Chiswick Commissioners passed a resolution allowing their clerk and surveyor, between them, 5 per cent. on all private street improvements which were made up by the Commissioners at the expense of the adjoining owners. The clerk received 2½ per cent. for the issue of the usual legal notices to the owners, and the surveyor 2½ per cent. for the preparation of the plans and the superintendence of the work. These commissions were, of course, exclusive of the regular salaries of these officials, and in quickly-developing parishes, where a great many new streets are in course of formation, this increment, to the official salaries amounts to a considerable sum where the commission system is in practice. The Chiswick Commissioners in fixing the 5 per cent. were guided evidently by the consideration of what would be fair and reasonable remuneration for the work to be done, keeping in view the fact that if they were to employ professional men outside their own staff the Commissioners would require to pay more than 5 per cent. But the effect of a recent decision, or rather communication, from the Local Government Board, has been to upset this arrangement in many districts. The decision of the Local Government Board is that a Local Board is entitled to charge the adjoining owners 2½ per cent. as a reasonable and fair remuneration for the superintendence of the work, whether it be done by the Board's own surveyor or not; that it is not entitled to charge the owners anything for the issue of the legal notice and for the preparation of the plans, which, it is held, the local authorities require, under the Act, to do as part of their duties, whether the streets are made up by the owners or the local authority. These bodies call upon the adjoining owners to make up the streets according to a certain plan which has been, of course, prepared antecedent to this call upon the owners. The opinions of an official may not be the opinions of the authority which he represents, but it is interesting to note that an experienced inspector of the Local Government Board, Mr. Harrison, C.E., at an inquiry at Chiswick, recently, into the application by the Commissioners for a loan of 15,000*l.* on street improvements, stated that the Local Government Board had practically nothing to do with the manner in which a Local Authority disposes of this 2½ per cent. A Local Authority may give this commission to their officials as an allowance outside their salaries, or they may give a salary which is supposed to include this commission. In short, so long as the Commissioners charge the adjoining owners no more than 2½ per cent. for the superintendence of the work, the Local Government Board has nothing to do with the arrangement which a Local Authority may make as to the remuneration of its officials. Mr. Harrison, C.E., held further that this 2½ per cent. should not be included in the contract in such a way as not to be distinguishable from the actual cost of the work; but should appear as a distinct and separate item in the note apportionment of the expenses to the various owners.

The Chiswick Improvement Commissioners have passed a resolution to the effect that all commissions on private street improvements shall go into the coffers of the Board; and they have reconsidered the salaries of the whole of the officials in their employ. They have decided, moreover, that the surveyor shall devote the whole of his time to the duties of the parish, and not undertake private practice as hitherto, and that his salary shall be 300*l.*, inclusive of any commission from private street improvements. The surveyor, Mr. H. O. Smith, C.E., who has designed and superintended the carrying out the parish drainage system and sewage works, which are on the precipitation principle, has now resigned, feeling that he could not accept the terms of the Commissioners, and Mr. Strachan, the assistant surveyor, has been appointed to the office at a salary of 300*l.*, on the conditions above indicated. The rates in Chiswick have been admittedly high for some time back,—nearly 6*s.* annually for the district rate,—and an idea having become prevalent in the parish that the Commissioners were extravagant in their expenditure, and that this was the cause of the numerous empty houses, both old and new, in the parish, a strong and influential Ratepayers' Defence Association has been formed in the district. At the last local election they turned out, with one exception, the whole of the retiring Commissioners, and placed five of their own candidates on the Board. The candidates of this Association are pledged to exercise the strictest economy, and to effect, if possible, a reduction of the rates. By the influence of this Association, the salaries of many of the officials have been reduced. The contention of this body is that, under the Public Health Act and the Chiswick Improvement Act, from both of which the Commissioners derive their powers, the officials had no right to accept an interest, in any shape or form, in a contract under the Board with which they are connected. There was a feeling among some of the members of this Association to institute proceedings against the officials, in order, if possible, to recover this money paid to them in the form of commission; but some of the "leading spirits" threw cold water on the idea, as departing from the objects of the Association.

EDINBURGH ARCHITECTURAL ASSOCIATION.

A MEETING of this Association was held on the 6th inst., the president, Mr. M'Gibbon, in the chair. The President stated that the Exhibition Committee were getting on very well with their arrangements, and there was every prospect of a successful exhibition. Promises of architectural drawings had been obtained from the principal architects in Edinburgh and London, and a large number were expected from Glasgow and elsewhere. It had not yet been quite arranged who was to open the Exhibition. The *conversazione* was to be held on the 22nd inst., and it was hoped that the President of the Royal Scottish Academy would perform the opening ceremony.

Mr. Leonard A. Wheatley then read a paper on "Building and Architecture in Babylonia and Assyria." In the course of his remarks, he gave an account of the Assyrian people and the sources of our information as to their history and architecture. The large mounds on which the palaces were built were stated to be formed of bricks, and the inscriptions told of forced labour employed on them. The summit of these mounds was reached by the flight of steps, traces of which were found at Persepolis. The plan of this palace showed the size and number of the rooms and courts. The method of transporting stones was described, and it was explained that the cities of Nineveh and Babylon were of such size, that gardens and parks were included within their walls, and that the temples were of great height, two mentioned by Fergusson being of seven stories. The houses were placed wide apart. The Assyrians, although conversant with the use of the arch, introduced it only for portals and smaller openings. The ceilings of their large halls were supported by wooden columns, the stone ones of Persepolis having had a wooden prototype.

EXPORTATION OF THE DUBLIN EXHIBITION PALACE TO ENGLAND.

THE Palace at Earlsport-terrace, Dublin, is in course of exportation to England. The huge structure of glass and iron, now being taken down, will be re-adjusted, renovated, and given a definite purpose in the British capital. It was private property. Its sale was negotiated early in the present year, and its removal has since been going on comparatively unnoticed. It was born of a noble international enterprise, the second great Exhibition in 1865. It lived a life of usefulness, sometimes achieving great results. It fell into disuse some time ago, but will rise again in England, it is hoped, to a career of greater usefulness. The site upon which the Exhibition Palace was reared had formed in the beginning of the present century a beautiful recreation-ground known as the "Coburg Gardens." They were opened in May, 1817, but failed and went to decay. Nearly half a century passed ere the ground (the property of the Earl of Clonmel) was turned to use. Then came the time when the Royal Dublin Society, immediately after the Fine Art Exhibition of 1861, agreed that there should be a second great International Exhibition in Dublin in 1865, and that a magnificent palace should be erected in which to hold it. Mr. A. J. Jones, architect, designed the edifice, the public bought shares to provide the capital; on May 9, 1865, the building was opened, and the Dublin International Exhibition arranged therein was inaugurated by the Prince of Wales, in the presence of 10,000 visitors. The Exhibition closed on Nov. 9th, having been open 159 days and fifty-one evenings, and the admission during that period numbered about 900,000. When the Exhibition terminated, there was an unsuccessful effort made to manage it after the manner of the London Crystal Palace, Sydenham. Government was then asked to purchase and endow it as a Science and Art Institute, but that application failed also. Sir Arthur Guinness, bart., M.P. (now Lord Ardilaun), and his brother, Mr. Cecil Guinness, constituting themselves trustees for the public, then purchased the building for about 60,000*l.*, renovated it at their own expense, and procured a manager

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for it in the hope of making it a place of recreation and profitable enjoyment for the people. Out of this grew the National Exhibition of 1872, held during the former viceroyalty of Earl Spencer. The Exhibition was a monetary success. In 1873 there was a miniature display of a somewhat similar sort. Since that time the palace has served as a place for public amusements. The brilliant fancy-dress ball of the Foot Guards, about 1868, the Moore Centenary celebration, and other events, are connected with it, but complaints were frequent that it did not pay. The building was last heard of, conspicuously, in connexion with the refusal of Mr. Cecil Guinness, D.L., to lend, let, or sell it for the holding of the "National Exhibition." Soon after his refusal, that portion of the edifice known as the glass building, which formed a part of the right-hand frontage, and extended as a long transept at the rear was sold by Mr. Guinness to a company of London noblemen and gentlemen, favoured with the support of H.R.H. Prince Teck. These parts would constitute in themselves a respectable Crystal Palace. They will be re-erected near Battersea Park. The intention of the company is understood to be to make this Crystal Palace an educational museum, which may be, in some degree, to the south-west of London what the Exhibition Buildings of Arts and Sciences at South Kensington are to the west end. The solid portion of the structure will remain, being an acquisition on the part of the Government for the purposes of the Royal University. At present, however, over this portion of the building there hovers the spirit of desolation, since the hammers of the workmen are clanking at the disjointing of the iron work sections. The roof of the transept is still intact, with the columns supporting it, but the galleries and balconies, and all except the iron columns at the sides, have been taken down, and the work is proceeding. The surrounding ground is covered with huge iron girders, arches, and pillars, awaiting transport across Channel.

THE FUTURE OF THE ALEXANDRA PALACE ESTATE.

It is stated that there is at present a probability of the Alexandra Palace, which has cost so much money in its erection, being taken down to clear the site for building upon. Under their present Act of Parliament the Financial Association, as owners of the Alexandra Park and Palace estate, are under an obligation to keep up the Palace and grounds as a place of public entertainment. Amongst the private Bills to be submitted to Parliament next session, one is promoted by the Financial Association, in which they give notice of their intention of applying for the repeal of so much of the existing Act as prevents them from laying out the Palace and grounds for building purposes.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

5,756. W. Foot, Wellington. Bricks, blocks, and slabs for building, &c. Dec. 2, 1882.

5,760. J. H. Johnson, London. Bricks and blocks for building purposes. (Com. by J. Darrigau, Vagnotte, France.) Dec. 2, 1882.

5,772. R. W. Hitchins, London. Construction of fire and sound proof ceilings and floors. Dec. 4, 1882.

5,778. J. D. Sprague, London. Window-sash fastenings. Dec. 5, 1882.

5,781. G. Crofts and G. F. Assinder, Birmingham. Joints for suspending swing fanlights, &c. Dec. 5, 1882.

5,795. J. Whitehouse and S. Peacock, Birmingham. Sash fastenings. Dec. 5, 1882.

5,848. J. W. Butler, Blackheath. Indurating artificial stone, &c. Dec. 7, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named :—

December 8, 1882.

3,701. C. E. Hanewald, London. Apparatus for preventing down-draught in chimneys, &c. (Com. by F. Haszelmann, Munich.) Aug. 3, 1882.

3,749. A. M. Clark, London. Fabric for wall-hangings. (Com. by A. Hutchinson, Paris.) Aug. 5, 1882.

3,817. H. J. Haddan, London. Apparatus for securing doors and windows against burglars. (Com. by W. Kilian, Berlin.) Aug. 10, 1882.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending December 9, 1882.

1,959. J. Noad, East Ham. Manufacture of ornamental surfaces for decorative purposes. April 25, 1882. Price 2d.

Silica or fine sand, clay, China clay, ground glass, sulphur, and boracic acid, are mixed together, then calcined, ground, and sifted. The mixture is then melted, and run into a mould. (*Pro. Pro.*)

2,015. G. Hurdle & W. Davies, Southampton. Opening and closing of window-sashes, &c. April 28, 1882. Price 2d.

A cog-wheel gears into a rack on the sash, and round the spindle of the wheel is a coiled spring. A stop will retain the window-sash in the required position, on releasing which the spring lifts the sash. (*Pro. Pro.*)

2,066. S. W. Wilkins, Edinburgh. Fireproof doors, shutters, &c. May 2, 1882. Price 2d.

These doors, &c., are made of double plates of metal, and a water-tank is arranged above, which can fill the space between the two plates. (*Pro. Pro.*)

2,080. W. Porter, Lee. Apparatus for testing the strength of materials, especially cement. May 2, 1882. Price 1s. 2d.

The block of cement is held by two slips, one clip being secured to a spring on a bar. As the bar is removed, the strength is tested. To secure an even strain, a piston is connected to the spring, which works in a cylinder filled with liquid. This prevents too sudden a strain being brought on.

2,084. D. Walker and W. S. Simpson, London. Window-sash fasteners. May 3, 1882. Price 2d.

The fastener is automatically locked by a lever pressed against its face by a spring. (*Pro. Pro.*)

2,097. R. Guelton, Brighton. Artificial marbles. May 4, 1882. Price 6d.

These are composed of superfine and coarse cements, made of alabaster combined with alum, and are coloured as required with vegetable and mineral colours. The desired shapes are then produced in moulds.

2,116. A. W. Kershaw, Lancaster. Ventilators. May 5, 1882. Price 6d.

Three sets of deflectors, circular on plan, are arranged with openings between each. The deflectors are so placed that the openings are opposite the deflectors of the next inner or outer set.

CHARGES FOR BUILDERS' LICENCES.

Complaints have been recently made to the Vestry of Clerkenwell of the high charges made to builders and others for licences and other fees.

Messrs. Perry & Co., of Tredegar Works, Bow, in their letter as to the charges in respect to the House of Retreat, Lloyd-square, state:—"We do not think we should be called upon to pay a licence fee in addition to a rent for the hoarding, and have never been called upon to do so in any parish in London. We also strongly object to pay for making up your roadway, which we did not interfere with, except as a right of way to our works, which we expect to enjoy in common with the rest of the public. In estimating for this work, we put your fees at about half the amount you charge, judging from what we have paid in other places." In conclusion, the Vestry were asked to reduce the amount of the account at least to the extent of the above items.

Mr. R. G. Battley, of 21, Old Kent-road, in a letter to the Vestry, states:—"*Re* Hoarding Account.—I think there must be a great mistake in it, as I was under the impression that our deposit considerably overpaid the amount due. I have never had similar charges from any vestry during the fifteen years I have been in business. I have inquired of other local authorities, and also studied the Local Management Acts, and can find no authority for charging per month for licences, nor for the superficial contents of hoardings. According to the best advice I can get, 5*l.* ought to have covered everything; we paid 10*l.* I do not think a separate licence should have been required for each raking shore: they were close against, and even formed part of, the hoarding which is charged for."

The matter having been referred to the Works Committee, a report has been received from the committee, stating that they also had before them the resolution of the Vestry, directing that 2s. per 100 square feet be charged per month upon all hoardings, and that they do not deem it expedient to make any alteration in the charges, but suggest that more information as to the nature and extent of the charges should be printed upon the licences.

TIMBER.

Sir,—Will one of your readers inform me as to the best mode of creosoting timber? I particularly wish to know whether the pure cold creosote, or the salts, which require heating, is the best; also, if it is necessary to have the wood seasoned before treatment, and if timber so treated is very much more durable for gates, hurdles, fences, &c.

Are there any objections against its use, as it is not in more general demand?

Awaiting an acknowledgment in your next issue.

M. E. Larke.

Competition.—Mr. John Bevan, of St. Nicholas-street, Bristol, has been successful in an open competition for the completion of St. Paul's Church, New Swindon, and erection of vicarage. Mr. Bevan has also recently been appointed architect for the new church in St. Andrew's Park, Bristol.

CASES UNDER METROPOLITAN BUILDING ACT.

FOUNDATIONS AND DAMP-COURSES.

At the Lambeth Police Court, on the 8th inst., Mr. H. Simpson, builder, was summoned at the instance of Mr. Parsons, District Surveyor, for doing certain work at the Station Hotel, Camberwell New-road, contrary to the Building Act, 1855.

It was alleged that defendant had erected a certain addition to the building without putting in the required concrete foundation and damp-courses, as mentioned in the by-laws of the Metropolitan Board of Works, 1879. One of the offences alleged to have been committed by the defendant was that he had not separated the said addition from the main building by means of an external or party wall. The question was considered to be one of importance with regard to buildings, and Mr. Parsons pointed out that he was but doing his duty in bringing the case before the court. The sections of the Act with regard to which the defendant had been summoned no doubt were meant for the protection of the public. The great object of one clause was to prevent the spread of fire. Some argument followed with regard to the various points of law, when

Mr. Ellison, the magistrate, said he could come to no other conclusion than that the defendant had infringed the terms of the section of the Act. It was most important that builders and others in the trade should look to these matters. He did not impute anything wrong to the defendant, but still he must pay 12s. costs.

"MORTAR."

At the Greenwich Police Court, last week, Messrs. Buckingham & Martin, builders, Sydenham, were summoned by Mr. Tolley, District Surveyor, for using upon their buildings in Longton-grove, Sydenham, mortar not composed of fresh lime and clean sharp sand or grit, without earthy matter, in the proportions of one of lime and three of sand or grit.

Mr. Tolley produced a sample of the mortar used at the house being erected by the defendants, and called Charles Jennings, who had been in their employ. He deposed that the mortar was composed of garden mould, road drift, surface soil, and soaked lime.

The defendants said they used fresh lime and grit from flint roads.

Mr. Balguy, the magistrate, said the mortar produced was decidedly unfit for use.

Mr. Tolley said the building, which had reached the second floor, was in a dangerous state, and the magistrate made an order for it to be pulled down forthwith.

NEW STREETS AT THE EAST END OF THE CITY.

Sir,—Will you allow us to call the attention of the authorities to the above subject through your valuable journal?

The District Railway Company are about to form a wide street from King William-street to Trinity-square. If this street were continued over the Metropolitan Railway just made, from Trinity-square to the Minories, it would greatly relieve Aldgate and Fenchurch-street of the enormous traffic going westward and down Gracechurch-street to Cannon-street and London Bridge, as drivers of vehicles would go along the broad street to avoid the constant block in Fenchurch-street and Aldgate.

Another improvement greatly needed in connexion with the above is the completion of the widening of Swan-street, from the Minories to Mansell-street as this would open another way for the traffic to and from the east.

We trust the authorities will take up these questions and not allow the present opportunity to pass without an effort to carry them out.

Two Citizens.

The Society of Engineers.—The twenty-eighth annual general meeting of the members of the Society of Engineers was held on Monday evening last, the 11th inst., in the Society's Hall, Victoria-street, Westminster. The chair was occupied by Mr. Jabez Church, president. The following gentlemen were balloted for and duly elected as the Council and officers for the ensuing year, viz.:—As president, Mr. Jabez Church; as vice-presidents, Mr. F. E. Duckham, Mr. Arthur Rigg, and Mr. C. Gandon; as ordinary members of Council, Mr. R. Berridge, Mr. Perry F. Nursey, Mr. A. F. Phillips, Mr. W. Schönheyder, Mr. Arthur T. Walmisley, Mr. T. H. Hovenden, Mr. Henry Robinson, and Mr. John Waddington, the three last-named gentlemen being new members of council; as honorary secretary and treasurer, Mr. A. Williams; and as auditor, Mr. A. Lass.

* Compiled by **Hart & Co., Patent Agents, 186, Fleet-street.**

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BRITISH ARCHÆOLOGICAL ASSOCIATION.

The second meeting of the session was held on the 6th inst., Mr. Thos. Morgan, F.S.A., in the chair.

Mr. L. Hand reported the discovery at Seagry, Wilts, of some ancient British interments on a spot which had long been pointed out by tradition only as an old cemetery. The spot is also referred to in a charter of old Saxon times as the place of heathen burial, a remarkable illustration of the continuance of local knowledge.

Dr. Stevens announced the discovery of traces of Roman burials at Winchester, at a spot near the north gate, which would appear to indicate the position of the ancient cemetery of the Roman city.

Mr. Loftus Brock, F.S.A., exhibited a Roman vase from Colchester, identical in form to the one found at Winchester referred to by Dr. Stevens.

Mr. C. H. Compton exhibited some stained glass from Amiens Cathedral thrown out of the building during a recent work of "restoration." Also some Roman concreted pavement from the temple which stood on the site of the present Cathedral of Boulogne. This is identical to what was found last year on the site of Leadenhall-market. Mr. H. F. J. Swayne sent photographs of the fifteenth century frescoes over the chancel arch of St. Thomas's Church, Salisbury.

Mr. Gibson Rendle exhibited some curious engravings by Heemskirk, illustrative of ancient costume; and Mr. Earle Way described a corbel of early date recently found in London.

Mr. W. de Gray Birch, F.S.A., called attention to the Tabula Honesta Missiones recently found in Belgium, which gave the name of a governor of Roman Britain, Titus Ævidius Nepos, not previously known.

Major di Cesnola, F.S.A., read a paper on Phœnician Art in Cyprus, which was illustrated by a very fine exhibition of gold and silver ornaments found in the excavations made in the Island by the lecturer. The connexion of the Phœnicians with the country was referred to at length, and the relics of their occupation passed in review after the history of this remarkable trading race had been dwelt upon. Many of the gold objects consisted of frontlets of thin metal with embossed patterns, very similar to those found by Dr. Schliemann at Hissarlik. The personal ornaments were of remarkable beauty and elegance of workmanship.

After the chairman had passed in review the results of the recent Congress at Plymouth, the proceedings were brought to a close by a paper by Mr. C. W. Dymond, F.S.A., on Two of the remarkable Earthworks in Somerset, Dolbury, and Cadbury,—the reputed Camelot of King Arthur's time.

SUGGESTED IMPROVEMENTS IN THE STRAND.

The Strand Improvement Association, a committee formed some months ago for promoting improvements in the Strand, appear to be fully alive to the opportunities presented by the completion of the Royal Courts of Justice. They have sent us a plan prepared by Mr. W. Milford Teulon, architect and surveyor, Upper Woburn-place, showing proposed improvements in the vicinity, one of the objects sought being the formation of a wide street approach from Holborn to the Strand, abolishing Little Turnstile, and then proceeding *viâ* Gate-street, the west side of Lincoln's Inn-fields, and a short new street through Clare Market,—continued through to Carey-street (south of King's College Hospital), on the one hand, and on the other hand, *viâ* Houghton-street and Newcastle-street (both widened) to the Strand. This plan is a good one, so far as it goes, and if carried out it will be a great deal better than nothing; but it appears to us to possess defects which are not apparent in the Hayward plan.

Mr. Teulon's plan provides for widening the Strand without demolishing St. Mary's Church. By setting back a few houses on the north side of the Strand, westward of Newcastle-street, a wide road could be made on the north side of the church, thus giving a 40-ft. road on each side of the church. At present the traffic on the roadway between the two churches is very much blocked, and by the opening of the New Courts this traffic is likely to be greatly increased. By this plan it is proposed that the two 20-ft. streets, viz., Holywell-street and Wych-street, be abolished, Wych-street being widened to 60ft., and the site of Holywell-street partly thrown into the Strand so as to widen it to 85 ft., leaving a large triangular piece of land for building sites in diminution of the cost of the improvement. The plan also proposes to remove the graveyard round St. Clement Danes Church: this will give a largely-increased area in front of the Law Courts. These proposals have much to recommend them.

We have received plans from several other persons, showing the interest with which the matter is regarded, but we see no reason to publish them. Before our present number is published, moreover, the Metropolitan Board of Works will probably have arrived at an opinion on the same.

HOUSE DECORATORS' CLUB AND INSTITUTE COMPANY.

A general meeting of the shareholders was held at their new premises, 19, Howland-street, W., on Tuesday night.

The report of the directors, showing that they had since the last meeting in July acquired the lease of these premises, and so far furnished and prepared them, that they were ready to hand it over to any committee of management that might be formed, was adopted. The thanks of the meeting being voted to Mr. J. G. Crace (Messrs. Crace & Son) and Mr. J. H. Donaldson (Messrs. Gillow), without whose aid their success so far would have been impossible.

The premises are spacious, and well adapted for the purposes of a club, there being, in addition to the rooms already fit for occupation, a large room at the back, about 50 ft. by 40 ft., fit for public meetings, and a room under, of the same area, which it is proposed to use as a billiard-room.

Already one of the oldest of the trade benefit societies, the Phœnix, hitherto meeting only in taverns, has made arrangements to rent rooms of the club; and at least two more societies are expected to follow shortly.

After the meeting a club committee was formed, and about eighty names of intending members given in.

THE BUILDERS OF THE CITY OF LONDON SCHOOL.

Sir,—At the ceremony of opening the new City of London Schools by the Prince of Wales, I have no doubt that it was quite proper that some of the City magnates should be introduced to the notice of his Royal Highness, and I am sure that it was equally proper that the architects, Messrs. Davis & Emanuel, should also be introduced; but why were not the contractors introduced? Surely the anxieties and responsibilities surrounding the erection of such an important building deserved some recognition in its noble hall to-day! I should say almost as much as the accidental possession of office by some of the City magnates. If it is said that time is of importance to Royalty on such an occasion, I have not the least hesitation in replying that nine-tenths of the Lord Mayor's speech could have been omitted with ease to himself, decided pleasure to his audience, and comfort to the Prince and Princess of Wales. That afternoon was not the time for elementary mathematical calculations.

It is to be regretted that the outside world should know so little of what is involved in the successful completion of a large building.

Wm. Woodward.

THE DECORATION OF ST. PAUL'S.*

Sir,—In Mr. Pullan's paper on this subject, read at the last meeting of the Royal Institute of British Architects, his remark that the sub-committee had "formed an alliance" with the two artists appeared at the time to convey an imputation. Probably those who know him best would not need his subsequent disclaimer; but, acting on a misconception, I commented on his words. As he afterwards explained that the expression was used without offensive intent or idea of imputation, it is due to him that I should now withdraw my hastily-formed interpretation and the resultant words. Hugh Stannus.

CHURCH-BUILDING NEWS.

Bermondsey.—St. Augustine's Church, of which the chancel and a portion of the nave were consecrated in 1879 by the Bishop of Rochester, is now in a fair way towards completion, Mr. Richard Foster having, on the 18th ult., laid the memorial-stone of the remainder of the nave. The style of architecture which has been adopted by the architects, Messrs. Henry Jarvis & Son, is Early English Gothic of a simple character. The exterior is free from all unnecessary ornament, and depends for its effect chiefly on size and proportion. The whole of the walls, both inside and outside, are of red bricks with stone dressings. The building when complete will consist of chancel, nave, and aisles, and the total internal length will be 128 ft. The chancel, which is 28 ft. wide and 40 ft. long, is vaulted in red brick, and divided by low stone arches from aisles which run round it on the north, east, and south sides. The organ is in a gallery over the north aisle of the chancel, and a seat for the organist is in an overhanging balcony projecting into the chancel. The nave will be of the same width as the chancel, and divided from the aisles by an arcade of five bays on either side. The arches will be carried on red stone piers, and above them will be a lofty clearstory. The roof will be of panelled wood, painted, of the wagon form, and the height to the apex will be about 48 ft. When completed, the church will seat about 1,000 persons. The peaty nature of the site has rendered it necessary to construct a crypt under the whole of the edifice. This is 12 ft. high, and will provide accommodation for Sunday schools and parochial meetings of various kinds. The contractor for the completion of the nave is Mr. Downs, of Hampton-street, Walworth. Mr. Cotterell is the clerk of works. A view of the interior of the church was given in the volume of the *Builder* for 1876, p. 12.

Fulmer (*Bucks*).—The parish church here, having been enlarged and reseated, has just been re-opened by the Bishop of Oxford. The works executed consist of a new south aisle in the Perpendicular style, with open-timbered oak roof. The old seats from the nave have been removed. The organ has now been placed near the chancel, and by removal of the gallery at the west end the tower has been thrown open to the church. All the new seats are executed in English oak; those in the tower being raised for the children. The aisles, &c., have been paved with Minton's tiles, and the whole has been thoroughly heated. Some old memorial windows had to be preserved, and some old glass adapted to the new windows, which has been done by Messrs. Egan & Fletcher, of Regent-street; and all the other works have been executed by Messrs. Fassnidge & Sons, of Uxbridge, under the superintendence of Alex. R. Stenning, architect, of Fenchurch-street.

Walkern, Herts.—The parish church, dedicated to St. Mary, having been restored under the supervision of Mr. Hugh Roumieu Gough, architect, of Queen Anne's-gate, was reopened on the 30th ult. Mr. John Lister, of Aston, Rotherham, was the general contractor. He has re-seated the edifice, put a new stone groined roof to the south-west porch, which had long since fallen into ruins, built a new south-east chapel, and done carefully much other necessary work. The south arcade is of Norman character, and in it occurs a singular piece of sculpture. It is in clunch stone, and represents a draped figure of our Lord on the Cross. Clothed representations of the crucified Christ are exceedingly rare. The old rood-screen is of oak, and of Perpendicular character. It has recently been restored, under Mr. Gough's directions, by Mr. Harry Hems. The cost of the works has been about 1,800*l.*

Launceston.—A contract for the restoration of the Church of St. Stephens-by-Launceston has been entered into between Mr. William Burt, builder, of Newport, and the trustees of the charity lands of the parish, and the work will be proceeded with at once, under the direction of the architects, Messrs. Hine & Odgers, whose plans have been approved by the Charity Commissioners. The contract amount is rather under 1,400*l.*, and provides for the complete renovation of the walls, roofs, and floors of the church, but much will remain to be done by private subscription in providing suitable fittings and furniture for the fabric. This church, which is of considerable historical and architectural interest, was collegiate before the Conquest, but with the exception of an arch on the north side, which was probably connected with the college, the present structure was erected in the fourteenth century, the tower being later. In the last century it was badly treated; the roofs were then closed up with flat plastered ceilings, garnished with the rosettes of the period. The open-timbered roofs will now be restored, as will also the original battlements. Polyphant stone will be largely used externally in the new work, as it was in the old.

Piddinghoe.—The Bishop of Chichester has re-opened the ancient parish church of Piddinghoe, Sussex, after restoration, which was entrusted to Mr. Philip Currey, architect, Howard-street, Strand, and the builder being Mr. Baker, of Rodmell, assisted in the masonry by Mr. Bridgman, of Lewes. Shortly after the work was commenced the foundations of the

* The following reached us after the preceding part of the journal was made up.

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old aisle were discovered, and the restoration has been carried out upon them; and now the church as restored consists of a tower, nave, with north and south aisles, and porch. The steeple has been re-shingled, and the tower, which is built in random flintwork, has been repointed. The chancel has had an entire new roof, which covers the aisles in one sweep, with small gables to allow of height for the vestry door and also of re-using the old windows in their original position. The arcading in all cases was found built up in the old walls, with the capitals and bases of columns very much mutilated, as, indeed, was all the masonry. This accounts for the long time required for the restoration, as each stone had to be taken out and restored almost one by one on account of the weak state the fabric had fallen into. One of the principal features of the restoration is the paving with encaustic tiles executed by Messrs. Minton. The seating is of open benches of varnished pine. The materials used in building have been flints, with Bath stone dressings on the exterior of the church, and Caen stone within. The whole of the stonework has been executed by Mr. Charles Bridgman, Lewes. The porch is of oak, and, together with the new part of the main building, has been covered with red tiles, like the old ones on the nave.

DIARIES.

Messrs. Hudson & Kearns (of Southwark-street) have again issued their well-bound and well-printed diaries, specially adapted for the use of architects and of builders, in addition to those prepared for the general public. These are Nos. 11 and 12, and there is a larger edition, with a double page for each day, for architects, No. 13. They have all necessary information, and are well indexed in more than one direction. As we pointed out on a previous occasion, they contain not only a diary which is virtually a day-book or journal, but a cash-book, ledger, or note-book, rent and insurance register, and the paper and binding are of unusual excellence. No. 11 is specially adapted to the requirements of those in the building trades, and contains a series of tables of a practical character. Amongst their productions for the office and counting-house, No. 8, Patent Date-indicating Blotting-pad and Book Diary, should be looked at.

Messrs. Letts have sent us some specimens of their cheaper works in the shape of diaries, pocket-books, and so on, equally important to a large number of persons. They are well known all over the country. No. 8, although called Letts's Office Diary (8vo., neatly bound, with a ruled page for each day), will be found a handy little book for those who, whether troubled with business cares or not, are in the habit of jotting down their thoughts or recording their doings.

Miscellanea.

The Suggested Trevithick Memorial.—Hearty response is reported in connexion with the proposed memorial to Richard Trevithick, the engineer, and which has already been mentioned in the *Builder*. It has been thought desirable to defer for a week or two the publication of the names of those who will act as the committee, in order that there may be no appearance of giving priority. Those desirous of acting should communicate with the honorary secretary, Capt. John Davis, 2, Edinburgh Mansions, Victoria-street, Westminster. At a recent meeting of the Mining Institute of Cornwall, the President, Mr. W. Husband, C.E., said that with reference to the memorial, some friends wishing to forward the matter met together to appoint a committee. The feeling was that they should make the Trevithick Memorial as national as possible. Trevithick worked in two hemispheres, and in every part of this country; and, indeed, the most important of his experiments were made out of Cornwall. And seeing the extent of the field he worked over, and seeing the honour which was awarded to Stephenson, who had monopolised all the honours in the North, and that those who so honoured him were beginning to think that Trevithick had not been done justice to, and that these and others would come forward to assist them in this memorial, the endeavour would be to establish a strong committee in London, with sub-committees in the various provinces or in counties.

The Coal Trade.—A serious reaction has taken place in the coal trade. The anticipations that the advance of 10 per cent. in miners' wages would lead to a permanent increase in the price of coal have proved altogether illusory. The advance was made on November 1st, and the coalowners generally raised their rates by 1s. per ton.—from 9s. to 10s. per ton. But already the London and provincial markets are over-stocked with coal which cannot be sold; and Yorkshire and Derbyshire coalowners are obliged to accept 1s. 6d. per ton less than they were getting immediately before the 10 per cent. was conceded. This leaves them practically with 6d. per ton less for their coal, while they have to pay 10 per. cent. more for the getting of it. Nor is this all. North-country coal is placed on the London markets at 3s. 6d. to 4s. per ton less than immediately before the advance of 10 per cent. Yorkshire and Derbyshire coalowners are utterly unable to compete against such reductions, and the consequence is that the output of coal in these districts is now being restricted by the lessening of labour. In one leading colliery, which sends the largest tonnage of Silkstone house fuel to London, only three days per week are now being worked. Already a movement is on foot to repeal the 10 per cent. and bring wages back to the old level. Lancashire is taking the lead, and the coalowners of Yorkshire, Derbyshire, Durham, and Northumberland are also moving in the matter. There seems every prospect that the concession of 10 per cent. to the colliers will be very short-lived. It may interest London consumers to learn that the merchants have fixed their share of the reduction at 1s. per ton.—*The Engineer.*

Dublin Sanitary Association.—At the meeting of the executive committee of this Association, on the 7th inst., Dr. Cosgrave in the chair, attention was called to the Registrar-General's returns for the past week, comparing fifty-two large towns in the United Kingdom. The Irish towns stand first, with a mortality of 29 per 1,000, while the English and Scotch towns have death-rates of 22 and 25 per 1,000 respectively. Resolved:—

"That in the interest of the health of the public, the executive committee direct attention to the dangerous practice which at present prevails in Dublin of thawing the snow on the pavements by means of a free sprinkling of salt. By this mixture of snow and salt intense cold is produced, and the feet of the passers-by are chilled in such a way as seriously to imperil health; besides, a sheet of smooth ice is subsequently formed. The executive committee suggest that sprinkling the pavements with dry, clean sawdust, sand, or straw, will be found to neutralise the danger of slipping in time of frost and snow, and to prevent injury to health through unnecessary chilling of the feet, and the possible occurrence of fractures and other accidents."

Proposed Industrial Exhibitions in Ireland.—At the meeting of the Limerick Corporation on the 7th inst., the mayor (Mr. Jerome Counihan, J.P.) presiding, Mr. John Bernal remarked that in Cork great efforts were being made te hold an exhibition next year of manufacturing materials and manufactured goods, and he could not see why they in Limerick should not give their idle-stricken artisans and tradesmen the same opportunity, and put them in the same position they were trying to do in Cork. He moved that they report progress, and have the matter laid before the local committee appointed in connexion with the forthcoming show of the Royal Agricultural Society. The mayor observed there was no necessity for a formal resolution in the matter mentioned by Mr. Bernal, for he would take it on himself to have it laid before the local committee in connexion with the show of the Royal Agricultural Society.

A Doleful Anniversary.—Friday, December 8, was the first anniversary of the terrible fire at the Ring Theatre, Vienna. The Central Cemetery was thronged with visitors, bringing *immortelles* and wreaths of flowers. The Vienna papers comment on the catastrophe, and most of them point out that in the year that has since elapsed no very remarkable improvement has taken place in the theatres, the fire brigade, or the police management of this capital. The manager of the Ring Theatre, Herr Jauner, and others, though sentenced to imprisonment in the great trial last summer, are still in the enjoyment of their liberty, pending the appeal they have lodged against the decision of the court that condemned them.

"Grip" Tramways in Chicago.—Mr Thomas Cornish, M.E., writing in the *Mining Journal*, describes Chicago and its "grip" tram-cars. He says,—"These cars run on several lines of streets without horses and apparently without any outward or visible signs of motive power; they are a great improvement on the ordinary means of street locomotion, and as there is no difficulty in working the wires round sharp turnings or for any reasonable distance, they will, no doubt, in many cases soon supplant the horse tram-cars in English cities, as I notice one company has already started to introduce the system in London. The Chicago Company have their works depôt at the corner of State-street and Twenty First-street, which I had the pleasure of inspecting through the courtesy of the engineer and foreman. The cars are driven by means of an endless rope running along and under the track connected with and running over the driving-wheels at the depôt. Two or more cars can be attached together, the front car is provided with gripping gear thrown on or off at the will of the driver. The steel wire rope is continually travelling over guide wheels fixed in a large groove (built under the track) at the rate of about six miles an hour. By throwing on the levers the grips catch hold of the travelling wire rope, and consequently the car travels as fast as the wire is going. The cars are stopped by throwing off the grip. This system was, I believe, first successfully introduced in San Francisco."

Chelsea and Electric Lighting.—This question was considered at the meeting of the Chelsea Vestry last week. The Vestry had under consideration the notices received from several electric light companies of their intention to apply for provisional orders for the district, together with an elaborate report upon the whole question by Mr. G. H. Stayton, C.E., their surveyor. The report concluded with the following recommendations, which were unanimously adopted:—1. That at present it is not desirable for the Vestry to apply for a licence or provisional order. 2. That it is not desirable to consent to any application for a licence until the draft shall have been submitted to, and has received the approval of, the Vestry. 3. That it is desirable to support the application of any company who may appear most likely to carry out the undertaking in a satisfactory manner, and who will agree to such of the suggested conditions as the Board of Trade may approve, and that the Electric Lighting Committee and the surveyor be empowered to enter into the necessary negotiations for effecting that object. 4. That the solicitors be instructed to watch the progress of the applications for provisional orders, and to take all necessary steps to oppose the same until satisfactory conditions are obtained.

Not completing the Bargain.—The dispute between Lord Marcus Beresford and Prince Batthyany about an alleged contract to sell the Warren House estate at Newmarket to Lord Marcus Beresford for 12,000*l.* came before the Court of Appeal at Lincoln's Inn last week, on appeal from the decision of Mr. Justice Kay. The Master of the Rolls said that the question involved was whether the offer of Prince Batthyany of the 2nd of January, 1882, to sell the house was accepted by Lord Marcus Beresford before the withdrawal on the 6th of January. On this point there was a distinct conflict of evidence; and the judge who had heard the witnesses came to the conclusion that Lord Marcus Beresford had not made out his case. He agreed with the decision of the Court below, and consequently the appeal must be dismissed. Lords Justices Cotton and Bowen concurred.

The Proposed Town-hall at Hawick.—At the meeting of the Hawick Town Council on the 5th inst., Provost Watson said it was not his intention to divide the Council on the subject of erecting a town-hall. It was evident from the statements made at the ward meetings that the public did not desire the purchase of the Exchange Hall for the purpose of converting it into municipal buildings; and that being so, it was not his intention to press the matter. Notwithstanding his views on the subject, he would be willing to proceed with the erection of the buildings on the present site, and in asking that the matter be considered at a private meeting of the Council, pointed out that it was necessary to ascertain the present and prospective burgh revenue, so that the annual charge on the buildings might be met, and the cost paid off. The suggestion was agreed to.

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Destructives Fires.—A serious fire broke out at Hampton Court Palace, early on Thursday morning last, in one of the suites of apartments on the third story of the dwellings fronting Fountain Court. The cause assigned is the upsetting of a spirit lamp in the bedroom of one of the domestics. The apartments in which the fire broke out are described as situated over a portion of the picture-gallery. The fire was eventually got under, but it is stated that the whole of the upper part of the eastern portion of the buildings is completely gutted. Great efforts were made by the Hussars and firemen in extinguishing the fire and rescuing the pictures and other valuable property, but at the time we go to press it is reported that many pictures have been seriously damaged, whether by fire or water it is not stated. One of the domestics is reported to have been suffocated by the smoke.——The great fire in Wood-street last week followed closely on the destruction of the Alhambra Theatre, and is stated to have destroyed property to the value of between two and three millions sterling. The scene of the fire must be visited to realise the havoc which it has caused in this crowded and busy part of the City, and the catastrophe gives further point to the remarks we made last week as to the paramount necessity of doing something to augment our resources for fire extinction.——A serious fire is reported from Dublin, and another one at Plymouth, where the Presbyterian church and schools at Eldad have been destroyed. The buildings were only three years old. What proportion of our churches is insured?

Fatal Scaffold Accident.—On Saturday last, Dr. Diplock, Coroner for West Middlesex, held a long inquiry at Teddington, relative to the death of Henry Stuart, aged 40, a slater, who met with his death from a fall from the roof of a house. Charles Barnes, a bricklayer's labourer, said that he was at work on Tuesday at a house in Royal-road, Teddington. The deceased was at work on the next house. Witness saw Stuart suddenly fall from the highest stage of scaffolding, and alight on the ground. Two boards fell at the same time. The lowest staging was composed of two boards resting on putlogs. There was only one "ledger" and no brace poles. Joseph Dorrell, a labourer, of 3, Victa-road, Teddington, stated that the deceased was endeavouring to put the ridge-tiles on the roof of the house, when the ladder gave way and he fell to the ground. The putlogand the scaffold-boards came away from the building at the same time. The putlog was not wedged in. The rope, which should have made the "ledger" fast, was quite loose. The jury returned a verdict of "Accidental death," and appended the following rider:—"We are of opinion that the scaffolding was not securely fixed."

The Theatre Royal and Opera-House, Bournemouth, was opened on December 7th. The theatre was projected by a limited liability company, but the shares not being taken up, the site was acquired by Mr. William Stanley, of Bournemouth, builder, who erected the theatre as a private speculation, and has since sold it to the present proprietors, Messrs. Stevenson & Nash. The works have been carried out from designs by Messrs. Kemp-Welch, & Pinder, architects, of Bournemouth. Mr. W. Nightingale acted as clerk of works, and Mr. W. Hunt as general foreman. The total accommodation is for about 1,000 persons. Means have been taken with a view to ensure safety to the audience in case of fire, the staircase, &c., being of concrete, and hydrants being placed in various parts of the house. The decorations were executed by Mr. W. Bevis, under the direction of Mr. R. T. Sims, of London. The drop-scene was the work of Mr. G. Collier, of Hull. Mr. E. G. Thompson executed the gas fittings. The total cost was about 10,000*l.*

Assistant Engineer for the City of London.—There were nearly a hundred applicants for the post of assistant to the engineer and surveyor of the City Commissioners of Sewers. After a rigid examination as to merits the number was reduced to three,—Mr. W. H. Copland, Mr. W. H. A. de Pape, surveyor to the Tottenham Local Board, and Mr. D. J. Ross, an old servant of the Corporation. The election took place on the 7th inst., when Mr. Copland was voted out, and the contest was between Messrs. De Pape and Ross. The latter received thirty-two votes and the former twenty-eight.

Holy Trinity Church, Darlington, is to be reseated, lighted, and ventilated, under the direction of Mr. G. G. Hoskins, F.R.I.B.A.

"Model Abattoirs."—The sum needed to erect a small model abattoir having been obtained, a meeting was held on Saturday last in the rooms of the Royal Society for the Prevention of Cruelty to Animals, Jermyn-street, to "consider the practical steps to be taken." Dr. B. W. Richardson occupied the chair. On the motion of the Hon. Rollo Russell, the following resolution was cordially adopted:—"That the sum of 1,000*l.* having now been subscribed to establish a small model abattoir, the committee of the Society be empowered to take such practical steps as they may see desirable for the attainment of that object." It was agreed that the designation of the Association should be altered to "The London Model Abattoir Society"; and a resolution was also passed appealing to the public for liberal support in promotion of the objects which the Society has in view. What architect is engaged on the matter?

Tynemouth.—The Church of the Holy Saviour, Tynemouth, built more than forty years ago, was re-opened on Sunday, December 3rd, by the Bishop of Newcastle, after re-seating, enlargement, and decoration, under the direction of Mr. F. R. N. Haswell, architect, North Shields. The church as now arranged has a central passage and two side aisles. The benches are the work of the North of England School Furnishing Company, Darlington, from a design by Mr. Haswell. The decorative work was placed in the hands of Messrs. Laidlaw, of Newcastle. All the old paint has been stripped off, and the wood simply stained and varnished; the walls are coloured a pale terra-cotta. A new font, from the studio of Mr. J. Forsyth, of Baker-street, London, and standing upon fine columns of serpentine marble, has been placed at the west end. New windows of cathedral glass have been put in by Messrs. Sowerby, of Gateshead.

Strong Rooms.—On Saturday, shortly after the Prince of Wales visited the ruins of the fire in the City, Messrs. Foster, Porter, & Co. were able to reach their strong room, the entrance to which is secured by a pair of Chubb's massive steel doors. With very little trouble Messrs. Chubb's men opened the doors, and the room was then entered by the directors, who found all the contents uninjured. Several tons' weight of books were quickly removed, and it may be mentioned that though there were safes inside the room, the books which were lying outside the safes were uninjured by fire.

Kendal.—In St. Thomas's Church in this town a Caen stone pulpit has been set, of the Early English style, with red Irish marble columns supporting the upper part, and with carved bosses introduced at intervals. The cornice and caps to the columns are carved with trefoil ornaments. Messrs. Jones & Willis did the work.

Architectural Association Travelling Studentship.—At the meeting of this Association, on the 8th inst., Mr. Cole A. Adams made the announcement that the Sketch Book Committee had given a donation of 100*l.* to the Association Travelling Studentship Fund.

Surveyors' Institution.—The next meeting will be held on Monday, December 18th, when a Paper will be read by Mr. E. I'Anson (Vice-President), on "The Practice of Discounting the Value of Estates in Reversion."

TENDERS

For paving works, North Woolwich, at per foot run, for the Woolwich Local Board of Health. (Only part given.) Mr. H. O. Thomas, surveyor:—

Store-road:—			
Brightmore, North Woolwich	£1	2	6
Jackson, West Ham	0	12	0
Rutty, Bromley-by-Bow	0	11	6
Bentley, Chislehurst	0	11	5
Mowlem & Co., London	0	11	3
Wilson, Battersea	0	11	0
Rinder, Woolwich	0	10	2
Woodham & Fry, Catford	0	7	11
North-road:—			
Brightmore, North Woolwich	0	19	6
Jackson, West Ham	0	11	9
Wilson, Battersea	0	11	0
Bentley, Chislehurst	0	10	7
Mowlem & Co., London	0	10	5
Rinder, Woolwich	0	10	2
Rutty, Bromley-by-Bow	0	10	0
Woodham & Fry, Catford	0	7	0
Green-lane:—			
Brightmore, North Woolwich	0	12	0
Jackson, West Ham	0	7	9
Wilson, Battersea	0	7	0
Rutty, Bromley-by-Bow	0	6	9
Mowlem & Co., London	0	6	5
Bentley, Chislehurst	0	6	3
Rinder, Woolwich	0	4	11
Woodham & Fry, Catford	0	4	7

For re-seating Christ Church, Clevedon, Somerset. Mr E. H. Lingen-Barker, architect. Quantities supplied:—

	Pitch-Pine.			Oak.		
Birch & Co., Farnham	£496	0	0	£644	0	0
Howard, London	494	0		640	0	0
Shearburn & Co., Dorking	462	0		591	0	0
Jones & Willis, Birmingham	436	0		598	8	6
Cox & Sons, London	400	0		702	0	0
Wippell & Co., Exeter	390	0		570	0	0
Green, Clevedon	390	0		435	12	6
Davis, Bristol	385	0		622	0	0
Cawson & Co., London	378	0		476	0	0
Edgar & Chedzey, London	378	0		516	0	0
W. Jones, Gloucester	360	0		680	0	0
Eastabrook & Son, Bristol	357	0		645	0	0
Coleman Bros., Chaxhill	356	0		506	0	0
Whittingham, Newport, Salop	350	0		435	0	0
Beale, London	348	15		393	10	0
Inwood, Malvern	348	0		496	0	0
Collins, Tewkesbury	345	0		470	0	0
Midland Joinery Company, Birmingham	340	0		539	13	0
Hatherley Bros., Bristol	337	0		597	0	0
Yates, Shifnal	330	0		460	0	0
Bromfield, Clevedon	327	10		417	5	0
Crocker, Bristol	322	0		496	0	0
Wibby, Gloucester	312	0		407	0	0
Brock & Bruce, Bristol	267	0		500	0	0
Stephens & Bastow, Bristol*	259	0		549	0	0
Balcombe, Kenilworth	258	0		433	0	0
Forse, Bristol	255	0		390	0	0
Shopland, Clevedon	245	0		380	0	0
Chapple, Bideford	160	0		190	0	0

* Accepted.

For a house, Hene-lane, Worthing. Mr. Geo. Truefitt, architect:—

Inkpen	£2,096	0	0
C. Patching	1,750	0	0
R. Blaker	1,637	0	0
G. Baker	1,345	0	0
Hyde Bros. & Cook (accepted)	1,340	0	0

For new testing-house and packing-house for Messrs. Stone & Co., iron and copper founders, Deptford. Messrs. Snooke & Stock, architects:—
J. Cawson & Son (accepted).

For repairs at No. 24, Wigmore-street. for Messrs. Pennington & Typke. Mr. S. Parker, 427, Edgware-road, architect:—
Petchey (accepted) £245 0 0

For the erection of conservatory and verandah at "Tregaron," Beckenham, for Mr. W. Mortlock. Mr. S. Parker, architect:—
Jones (accepted) £165 0 0

For rebuilding chimney stack and part of wing of building at No. 56, Welbeck-street, for Mr. W. Haynes. Mr. S. Parker, architect:—
Smith Bros. (accepted) £141 10 0

For alterations to The Champion public-house, Bond-street, Vauxhall, for Messrs. J. Carter, Wood, & Co., the Artillery Brewery, Westminster. Quantities by Mr. Edutchloe, the Albert-chambers, Victoria-street, Westminster:—

Falkner	£675	0	0
Richards & Son	625	0	0
Boyce	570	0	0
Stiling	539	0	0
W. King & Son (accepted)	520	0	0

For the erection of two shops and dwelling-houses adjoining the above, for Messrs. J. Carter Wood & Co. Quantities by Mr. Edwd. Crutchloe:—

Boyce	£767	0	0
Richards & Son	728	0	0
Falkner	675	0	0
W. King & Son	637	0	0
Stephens	618	0	0
Stiling (accepted)	599	10	0

For rebuilding flank wall, and putting in shop-front, No. 44, Poole's Park, Seven Sisters-road, Finsbury Park, for Mr. Crisfield. Mr. D. Taylor, architect, Wood-green:—

Deasley	£130	0	0
F. Voller, Wood-green	115	0	0

For the erection of two houses and shops, Myddelton-road, Bowes Park Estate, Wood-green, for Mr. A. Tait, Hornsey-road, Holloway. Mr. D. Taylor, architect:—

Scarborough	£1,540	0	0
G. H. Allen	1,395	0	0
F. Voller	1,345	0	0
R. W. Piper	1,330	0	0

For sinking and boring a brick and tube well, 350 ft. deep, at the Wimbledon Sanitary Laundry, Worple-road, Wimbledon. Messrs. Ebbetts & Cobb, architects, Savoy House, 115, Strand:—

Thos. Tilley* (5 in. tubes)	£397	12	6
Le Grand & Sutcliffe (3 in. tubes)	391	17	0
Eastell & Sons (5 in. cast pipes, and no brickwork)	296	10	0

* Accepted.

For reinstating damage by fire to tobacco and cigar factories, Half Moon-passage, Whitechapel, for Messrs. B. Morris & Sons. Mr. John Hudson, architect, 80, Leman-street:—
C. P. Roberts, Canonbury (accepted) £1,258 0 0

For the erection of five houses and shops at Maryland Point, Stratford, for Mr. E. Jex. Mr. John Hudson, architect. Quantities by Messrs. Franklin & Andrews:—
M. Gentry, Stratford (accepted) £5,900 0 0

For the erection of experimental works at the Metropolitan outfall, Barking, for the "Parker and Andrew's" system of sewage purification. Mr. John H. Swan, C.E., engineer, 110, Cannon-street. Quantities by Messrs. Evans & Deacon:—
J. Cardus, Acton (accepted) £1,600 0 0

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For road and sewer works on the United Land Company's Hurlingham Freehold Building Estate, King's road, Fulham:—

J. G. B. Marshall	£2,280	0	0
W. Harris	2,120	0	0
Beadle Bros.	1,846	0	0
Geo. Acock	1,790	0	0
Tomes & Wimpey	1,780	0	0
Wilkes & Co.	1,778	0	0
Jas. Pizzey	1,766	0	0
R. Finnegan	1,747	0	0
E. & W. Iles	1,735	0	0
Rogers & Dickens	1,698	0	0
W. G. Harris	1,673	0	0
Jesse Jackson	1,666	0	0
Bottams Bros.	1,650	0	0
Wm. Williams	1,642	0	0
Nowell & Robson	1,633	0	0
J. Bentley	1,588	14	0
H. Wilson	1,483	0	0
A. Catley	1,482	0	0
G. Felton	1,448	0	0
T. Spurgeon	1,400	0	0
W. Nicholls	1,395	0	0
Saunders & Co. (accepted)	1,297	13	0
J. E. Baxter	1,173	10	0!

For extension of plant in the brewhouse department at the Tadcaster Brewery, for Mr. J. Smith. Messrs. Scamell & Colyer, engineers, 18, Great George-street:—

Contract No. 4.

Pontifex & Wood, London (accepted) £1,993 0 0

Contract No. 5.

Ramsden & Sons, London (accepted)... £257 0 0

For alterations and additions to Eastgate House, Lincoln, for Mr. S. Lowe. Mr. M. Drury, architect. Quantities supplied:—

Wright	£3,666	0	0
Howson	3,334	0	0
Close & Co.	3,327	0	0
Morgan	3,280	0	0
Otter & Broughton	3,223	0	0
Harrison	3,130	0	0
Hensman	3,127	0	0
Cowen & Lansdowne	3,064	0	0
Horton	2,903	0	0
Martin & Sims	2,880	0	0
Thompson	2,676	0	0
Taylor	2,405	0	0
Young (accepted)	2,134	0	0

For repairs and decorations to No. 34, Longridge-road, Earl's Court. Mr. Alfred Wright, architect, 190A, Brompton-road:—

G. King	£265	12	0
Langridge	198	0	0
D. S. Rice	165	0	0
W. Johnson	156	10	0
Hunt & Freeman	145	0	0

For taking down and rebuilding No. 1, Great Wild-street, Great Queen-street. Mr. Wm. Smith, architect. Quantities by Mr. E. J. Pain:—

Johnson	£975	0	0
Durnford & Langham	939	0	0
Mattock Bros.	913	0	0
Stevens Bros.	890	0	0
Shurmur	855	0	0
Anley	855	0	0
Larke	830	0	0
Harper	816	0	0
J. O. Richardson*	799	0	0

* Mr. Richardson's tender was sent by telegram, and was not accepted, as being irregular.

For the construction of stoneware pipe sewers, with manholes, &c., in the undermentioned private streets within the district of the Bromley (Kent) Local Board. Mr. Hugh S. Cregeen, surveyor to the Board:—

Tweedy-road:—

Thos. Crossley	£122	0	0
J. Garton	120	6	3
Davis & Attwood	114	12	0
Woodham & Fry	103	7	0
T. Lansbury (accepted)	102	0	0
J. Bentley	99	0	0

Newbury-road:—

Woodham & Fry	125	0	0
Davis & Attwood	122	12	0
J. Garton	120	4	0
J. Bentley	117	18	0
T. Lansbury (accepted)	111	10	0

For the erection of boys', girls', and infants' school, and master's house, Cogan, near Cardiff, for the Llandough-juxta-Penarth and Cogan U.D. School Board. Mr. H. Snell, Penarth, architect. Quantities by the architect:—

Jones, Bros., Cardiff	£3,600	0	0
J. Isaac, Pontardulais	3,583	13	6
H. Tapo, Penarth	3,560	10	0
W. R. Thorne, Penarth	3,553	8	3
Bowers & Co., Hereford	3,500	0	0
J. Thomas, Cardiff	3,400	0	0
Parnell & Fry, Cardiff	3,385	0	0
D. J. Davies, Cardiff	3,350	0	0
J. White, Swansea	3,300	0	0
D. Davies, Cardiff	3,250	0	0
H. Marshall, Cardiff	3,190	0	0
J. Jones, Penarth (accepted)	3,119	8	8
E. Howard, Cardiff	2,852	0	0

For the erection of house, Palace-gate, Kensington. Mr. W. Howard Seth Smith, architect. Quantities by Mr. Leaning:—

Patman & Fotheringham	£5,215	0	0
Patrick & Son	5,208	0	0
Julian & Co.	5,135	0	0
Brass	4,780	0	0
Nightingale	4,776	0	0
Hall, Beddall, & Co.	4,649	0	0

For the completion of "Bleasdale," Kensington. Mr. W. Howard Seth Smith, architect. Quantities by Mr. Leaning:—

Kiddle & Sons	£4,846	0	0
Hall, Beddall, & Co.	3,935	0	0

TO CORRESPONDENTS.

J. A. G. (inquire at the Italian Embassy).—Major W. (we are forced to decline pointing out books).—Mr. W. (should have sent correct list: paper not to hand).—G. J. S.—A. & H.—W. B.—H. & R. P.—Mr. H.—S. & C.—E. & C.—K. W. & P.—A. P.—C. E. D.—Mr. B.—J. M. H.—H. S. C.—J. H.—T. L.—A. W.—F. H. M.—Mr. L.—H. G.—J. B.—T. C. M.—F. R. C.—C. & Son.—G. H. S.—J. D. & Son.—R. T.—F. A. P.—T. G.—T. N.—F. W. C.—S. P.—B. E. F.—H. T.—D. J. M.—M. & S.—A. B. J.—A. T. T.

Correspondents should address the Editor, and not the Publisher except in cases of business.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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The Builder.

VOL. XLIII. No. 2081. SATURDAY, DECEMBER 23, 1882.

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The Jones Collection at the South Kensington Museum.

THE collection of objects of art which has been left to the South Kensington Museum in trust for the nation, by the late Mr. John Jones, of Piccadilly, would be a remarkable one even if it came from some ancestral home, as the product of the collective faculties of several generations of a family. As the collection of one man who had only towards middle life acquired a fortune and commenced laying it out in this way, it is probably unique. Not only is it remarkable for the extent and variety of the objects collected, and their pecuniary value, but as an example of the judgment shown in the choice of the objects purchased. There is nothing which does not represent the best class of work of its school, whatever our opinion as to the school generally may be. We make this qualifying remark, because we feel that we must distinguish between what is good of its class, what is well designed according to its style and admirable in its workmanship, and what is artistically of the best type *per se*. The compilers of the handbook to the collection speak very strongly, and, in one sense, not too strongly, of the advantage to art-workmen of having this splendid and varied collection to study from, and being enabled to see together and compare so many examples of the most admirable workmanship that could well be met with. It is natural also that the South Kensington authorities should be exceedingly gratified at being able to present to their visitors and students so complete a collection of the artistic furniture of a period which was before imperfectly represented in the Museum, and which, owing to the exceptional costliness of most of the articles, they could not have hoped for a very long period, if ever, to have been enabled to acquire by public funds. But there is another side to the matter. Splendid workmanship, which spares no trouble and no expense in attaining perfect execution, is a quality to be enthusiastic over for its own sake, no doubt; and it is of peculiar interest to have a collection which illustrates so fully one special school of work, and one which so completely dominated the taste of Europe during a very important and remarkable period of social history. But it would be wrong for any who are aiming at guiding public taste to any degree to overlook the fact that this beautiful workmanship represents also a period of very corrupt taste, and that the collection includes a great deal which, however costly and superb in workmanship, represents a very vitiated artistic style, and is by no means to be held up as an example of what ornament and artistic design ought to be. We could have wished that there had been some recognition of this in the otherwise well-written hand-book to the collection published by the South Kensington authorities. There need have been no ungracious undervaluing of the gift left to the nation. Its interest, in more ways than one, is sufficient to justify the warmest expressions of recognition of the knowledge and care which collected it, and the public spirit which placed it where it is. But it would be by no means desirable that workmen and designers should be encouraged to look upon such a collection as a fountain-head of pure taste, or to imitate all the forms and suggestions to be found there. The work of the Louis Quinze and Louis Seize period or periods represents some of the richest, most gorgeous, and most painstaking, as well as successful work which the world has ever seen. But it also represents in many instances a most frivolous and false taste, the true indication of the likings of a society in which all was show and glitter, luxury and selfishness, and which prized richness and ostentation above the pure taste in art of which it, in fact, knew little or nothing. Of much of the work of the period it may be said, that if it represents good taste in ornament and design, nearly all that has been said by the best and most thoughtful critics on this subject must be wrong, and all our ideas as to true and false taste would have to be reviewed or discarded.

It may be useful to consider for a moment why it is that ornamental work of this school is, for the most part, so false and misleading in style. The reason is mainly to be found in the fact that the ornamentists of the period in question did not turn to nature for guidance, or even to such natural truths of form and proportion as are set forth in geometry; they turned to artificial objects and to the reminiscence of another and extinct style. Now, ornament is, in its best forms, the kind of design which results from the application of thought to the treatment of natural forms. It is not imitation of nature; it is nature taken as the basis upon which to build a new creation, a design of human invention. But there is scarcely an example to be found in the French work of the eighteenth century which comes under this definition of ornament. The ornamental detail of the period may be classed under three heads; that which is an imitation of Roman ornament, more or less modified by the taste of Renaissance artists; that which is an imitation of artificial objects, such as wreaths, ribbons, festoons, and so on; and that which is merely play of line in the way of scrolls and other such forms. Ornament of the latter class may be very good and very interesting, so long as it is sufficiently abstract in form to appear merely as the representation of proportion in space and contour, and is treated in such a manner as to emphasise the construction and expression of the furniture or other object to which it may be applied. But the ornament of this class in French eighteenth-century work is not abstract. It looks like very corrupted forms of detail of Roman architecture and Roman design, put together without any intellectual connexion with each other, and without any clear flow of line, or appearance of what may be called constructive truthfulness; it seems to be put there because the artist did not know what else to put. This defect runs constantly through even good work of *le siècle*; ornament is added to a thing for no reason, for no love that the artist could have had for doing it (for it is impossible to suppose he could have had), but simply because the thing was to be handsome, and that was then the fashionable kind of handsomeness. The details derived from Classic work, sometimes well treated and sometimes ill, have that second-hand character and second-hand interest which always belong to imitation art; and as to the imitation of artificial gewgaws and trinkets as ornament, that is the very lowest system of ornament, being the one in which the least amount of thought is shown, and which takes as its starting-point some of the most commonplace of artificial objects, instead of the suggestive and typical forms of Nature. When we find a clock-case with an imitation napkin or towel in gold or ormulu hung over it, we feel that we have got to about the greatest depth of vulgarity to which taste in ornament can go: the thing has neither beauty nor meaning of any sort; but something must be put, and this will do as well as anything else to fill up the space, and to exhibit the costliness of the material and the cleverness of the manipulator. There is little or no thought in this school of work for the most part; its good qualities are a certain elegance in the best productions, and an exquisite workmanship, in which no pains and no time seem to have been spared towards doing the best that lay in the artist's power. The richness of the materials employed adds not a little to the effect; but that is not the best thing that can be said for any school of design. The highest decorative art is that which confers a new value on the material, whether costly in itself or not. The compilers of the handbook are very anxious to show that the prices at which some of the articles in the Jones collection are estimated represent their real marketable value for the time in which they were made, or something not far from that; and when we hear of three years being

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spent over a small writing-table we know that its money value for such thorough and honest work, must be very high; and that this must, of course, rise as the class of objects in question becomes more scarce, and they are more sought after by collectors. But it is necessary to say, and the South Kensington authorities ought to have said it, that collectors' value is one thing, and artistic value is another. We are told that the money value of a certain small snuff-box (No. 922 in the collection), with miniature subjects painted by Blaremberghe, is 1,500*l*. No doubt collectors would be found willing to give that price for an *objet de luxe* of this kind, so beautifully finished and so unique in its way; and we are far from depreciating the collectors' point of view. The taste for collecting serves to keep up the price of works of art, and is to be upheld on that account, at any rate. But we cannot help feeling that any man who gave that sum for the box in question on grounds of its artistic value alone would make a very foolish use of his money. The same sum would secure him things which, in the artistic sense, would be worth far more, and give far higher pleasure to any lover of art for its own sake.

It must, however, be said that the Jones Collection includes a good many things which represent the best qualities of French eighteenth-century art, with much less of its most pronounced faults than we are accustomed to see. This is the case in particular with a great many of the articles of furniture, writing-tables, and objects of that kind. These possess in a great degree the qualities both of elegance of design and of suitability to their purpose. It is, indeed, a rather weak stamp of work, and the predominance of curved lines in every direction, however remarkable as exhibiting finish and exactitude of workmanship, could not fail to produce this impression in work of which wood is the foundation. It is emphatically a boudoir style of furniture, looking as if only meant for occasional use by delicate feminine hands, and otherwise rather for show than for use. There hangs about it a kind of aroma of a highly-polished and artificialised society, which adds to it another and quite different interest from that which belongs to its artistic merit. Many of these delicate and feminine-looking bits of furniture have really been in the possession of princesses and other ladies of the period to which they belong. Several were the property of Marie Antoinette. We seem brought nearer to the French court of that era in looking at this collection of the kind of articles with which its sumptuous *salons* and boudoirs were furnished: we have a closer familiarity with the life and the tastes of the people who lived among these things.

There are things in the collection, however, which rise higher than this, such as the large Boule cabinet which stands in the inner gallery, and which is an astonishing piece of work in regard to execution, and certainly finer and purer in taste than a great deal of Louis Quatorze work. It was, we are told, bought by Mr. Jones from a house in Carlton-terrace, not long since, and is believed to have been made for Louis XIV. The decoration being mostly inlay, perfectly flat, the piece does not exhibit those swelling protuberances of outline which are so wearisomely repeated in much work of the same period. The execution is superb; nothing could surpass it, and its elaboration is astonishing; but, though the ornament is pleasing and far more tasteful than in many other specimens, it represents, for the most part, very commonplace forms, and there are few people in the present day with any power of designing at all who could not at least draw something better and more characteristic and interesting than this. Here and there we meet with things in which there is a curious and very unusual infusion of Oriental taste into part of the detail, greatly to the advantage of artistic effect and expression. The two small oval tables which stand near the entrance-door of the gallery, and which are not so much curved and twisted as some of their companions, are very charming specimens of elegant design and workmanship.

The collection is unquestionably a most remarkable one, and a great gain to the Museum; we have certainly no wish to at all depreciate the value of such a sumptuous legacy to the nation, and rather hope that it may set an example to be followed by others who have collections and no relatives with a more direct claim on them. But we wish to say a word of warning against the danger of taking things as models of artistic taste, which are rather models of patient and refined workmanship, and appendages of a luxurious and not (in the best sense) very highly cultivated society. The fact that kings, princes, and nobles could be content to spend such sums on designs of this class, containing so much that is false and frivolous in taste, really does lend some colour to the idea which has been promulgated of late, that wealth and luxury are inimical to the production or encouragement of a high class of art; though, of course, the history of society furnishes other evidence to the contrary. With this reservation of their admiration, let artisans study this collection diligently and observantly, and they will learn much; and the interest which it has for all educated people as a representation of a school is, of course, very great.

We may observe that, as usual at South Kensington, the things are arranged with no reference whatever to the order of the numbers on them, or to the way in which they are referred to in the handbook; so that the finding anything which is specially mentioned in the handbook, unless it be a large and prominent object, is a mere matter of chance. A complete catalogue is to come, and this, like the other catalogues, will be practically useless for any assistance in finding the objects. The numbers appear to be affixed solely to identify the different articles in the books of the museum, and have not the slightest reference to the placing of the objects. The consequence is that the finding anything one wants to find is next to impossible. We have referred to this absurd and needless source of difficulty thrown in the way of students, over and over again. Some one who is invested with power ought to come down sharply on the authorities and compel them to adopt a more rational system of nomenclature and grouping, and to have some method of indicating in their catalogues how to find the objects. There can be no difficulty in doing this, and no excuse for continuing such an absurd and inconvenient system, or want of system.

THE MODERN SWORD OF DAMOCLES.

Under this not inappropriate title, our contemporary the *Lancet* has very effectively called the attention of the public to a daily-increasing source of danger, against which in our columns on the 19th of February, 1881, as well as on other occasions, we have felt it a duty loudly to protest. On glancing at the titles of other articles about the date in question, it becomes evident that it was the interruption of telegraphic communication caused by storm that was the immediate occasion of the warning to which we refer. At the present moment it is almost enough to glance sky-wards in any street in London to become convinced of the rapid growth of a very serious source of danger. "It would be difficult," remarks our contemporary, "for a malevolent genius to devise any more dangerous apparatus than a long stout wire stretched from house to house across a public thoroughfare. In some unexpected moment, under extraordinary pressure, perhaps a heavy weight of snow, it is not merely possible, but likely, that it will fall to the ground, and in falling must almost inevitably cut in two all it strikes." In support of this view, we desire to recall the case in which an engine-driver on the Great Western Railway was absolutely decapitated by a telegraph-wire which had become detached from its support, and was hanging over the line at the level of his neck. It is true that the speed of the train,—some thirty or thirty-five miles an hour,—was here a factor in the case; and that it was the man who struck the wire, not the wire that struck the man. But let any reader who has a turn for figures ascertain the height above the ground at which the strands of this cobweb of death are usually stretched, and then calculate the velocity that will be attained by a body falling from that height. There will, of course, be a difference in the speed attained by a freely falling wire, and by one that is attached at one end. But making all allowance, we think that a blow from a trooper's sword could not be much more formidable than that sustained by any one who was struck by such a falling wire.

And then as to probability: it is, it seems to us, only a question of time. There are no means available for testing the safety of the wires. Leave them alone long enough, and they must snap from the ordinary effect of atmospheric corrosion; much accelerated, as it is in London and other great towns, by the sulphureous and nitrous fumes with which the air is apt to be loaded. It is also sure that such fractures will occur, when they take place, without warning; and also that it is precisely on the occasions when telegraphic communication is of most value, owing to the impeding of other modes of communication by snow or tempest, that its interruption by the failure of the wires is most likely to occur.

It should also be borne in mind that the case is one in which public vigilance is most likely to be lulled to sleep by a comparatively long period of immunity. Every wire has a certain average life, which may be ordinarily counted upon. We are not aware of any data that would allow us to calculate what that life should be. But be it ten, twenty, or any number of years, barring violence of any kind, it is clear that a great number of wires will attain a dangerous longevity about the same time. Then, according to the laws of probabilities, will occur all at once a great number of fractures, which can hardly be unattended by serious and even fatal calamities. What steps have been taken by any one, at the present time, to preserve the public from this certain, if deferred, danger?

It seems to us that, not merely with reference to this visible overhead danger, but also to some others that are silently, but rapidly, accumulating in many urban neighbourhoods, the rule of public safety is a simple one. No structure of any kind that *must* fail if left alone for a certain, though, as yet, an undetermined, time; of which the failure will be without due warning; and of which failure the results must be serious, and may be fatal; ought to be permitted in urban localities. We have forbidden, by special enactment, the storage or the carriage in and through towns of explosives in dangerous quantities. The rule is a sound one. It is demanded by public safety, and, sooner or later, unless other precautions be taken, it will be found that it ought to have been applied to our stretched wires.

For public safety, for the security of uninterrupted communication, and, ultimately, probably for reasons of economy, it is clear, in our opinion, that a subterranean channel must be adopted for the wires of the telegraph. As far as we are aware, it is not as to telegraphic wires, in the old sense of the word, that difficulty will arise, so much as to the communicating of that later born child of Hermes Trismegistus, the telephone. So delicate are the vibrations that convey a human whisper for dozens of miles, that the inductive effect of one wire on another is enough to disturb them, and thus, it has been urged, telephone wires must be aërial, as by no other mode of fixing can they be kept far enough apart not to interfere with one another by induction.

This, of course, is a point that demands attention. For our own part, we have not that feeble faith in science that should lead us to conclude that she can only, or best, be served by barbarous methods. And anything more barbarous than hitching wires to posts and pillars, to chimneys and steeples, it is not easy to suggest. Within the last few days, however, mention has been made in the public journals of a new invention (as to the nature of which silence is maintained) coming from Germany which gets over this difficulty as to induction. We are not without a suspicion that if the wire of communication be surrounded by a spiral wire through which a current is also maintained, the one induction may be found to balance the other (as in the case of the iron case for the magnetic compass in an iron ship), and that thus the whisper of the telephone may pass unimpeded through subterranean wires laid in well-fitted pipes. As to this, no doubt, we shall soon hear particulars, if the announcement be correct. But whether it be so or not, we are anxious to renew our former warnings, and to call the attention of those responsible for the safety of the public to the hourly-increasing danger of allowing all sorts of people to hang, at their own good pleasure, over the pathways of our towns and cities, a cobweb of wires along any strand of which, like an enormous spider, death may dart in a moment and make sure of his innocent victim.

The subject is one as to which, in more than one sense of the term, delays are dangerous. The call for attention is rendered all the more urgent by the competition now existing between the Post Office, as the proprietor of the tele-

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graphs, and the telephone companies. Any one who has become accustomed to the use of this last and most wonderful of the methods of artificial communication, will be aware of what a vast future lies before it. That it will become a most important,—we might even say the most important,—medium of messages, whether of a business nature or of a domestic character, there can, we apprehend, be but little doubt. What may be further its public services, so to speak, as in the transmission of the music of an opera, the solemn organ-flow of a religious service, the impassioned periods of a great preacher, or the new development of that Parliamentary obstruction which has been so extraordinarily fostered by the new forty-member rule,—it may seem almost fabulous to attempt to calculate. There seems no reason why the golden notes of a *prima donna* should fall only on the ears of her visible audience. Without, so far as we can tell, at all deadening the acoustic effect within theatre or church, the circle of the audience may be extended to all who are in telephonic communication with the building. Unless something unforeseen occurs, the arrangements of our towns and cities, the structure of our houses, the very habits of our daily life, are likely to be transformed by this subtle energy.

To this end the companies are silently but rapidly working. And each day that they are so allowed to work, not only stretches tons of additional wires over our heads, but goes to create at least the presumption of a vested right in the use of our house-tops by the telephone companies. Let us suppose matters to go on, just as they are now doing, till the time when the earliest wires attain their natural period of durability, and that then, within a few weeks, we have a dozen cases of slaughter in the streets by the natural agency of the decaying wire. What will be the public excitement? What the demand for the immediate removal of the source of danger? What the cost of the hurried change? What the inconvenience? What the demands for compensation, to be provided by a legislature, and paid by a public, that took no heed of the growth of the mischievous and threatening mode of putting house in communication with house, until it was too late? The confusion will be something altogether without precedent. It is thus not only in behalf of the one client for whom the scientific journalist holds a general retainer (viz., the public), but also on behalf of the telephone companies themselves, that we desire to join in the remonstrances now made, and to plead for the public safety.

HAMPTON COURT PALACE.

"Close by those meads for ever crown'd with flowers,
Where Thames with pride surveys his rising towers,
There stands a structure of majestic frame,
Which from the neighbouring Hampton takes its name.
Here Britain's statesmen oft the fall foredoom
Of foreign tyrants and of nymphs at home;
Here thou, great Anna! whom three realms obey,
Dost sometimes counsel take—and sometimes tea."
—*Rape of the Lock*, canto iii.

THE manor of Hampton is thus described in the Book of Domesday:—Walter Fitzother holds the manor of Hamntone, in the hundred of Spelthorne, which is taxed at 35 hides . . . . . in the whole it is valued at 39*l.* per annum, when it came to the present owner at 20*l.*, in King Edward's [the Confessor's] time at 40*l.*; it was then held by Earl Algar. After the Conquest we find it in the possession of Sir Walter de Valery, who gave the advowson to the Priory of Takeley in Essex, a cell to St. Valery in Picardy, whence the Norman sailed for his descent upon England. The manor then passed to Sir Robert Gray, whose widow, Joan, devised it to the Knights Hospitallers in the year 1211, whilst there would seem to have been a house here for some sisters of that order. About 300 years later Wolsey, struck with its pleasant and convenient situation, obtained a lease of the manor and manor-house. He then set about building the magnificent mansion which so excited his royal master's cupidity that, making a virtue of necessity, he gave it to the king, who celebrated his entry into possession with a splendid entertainment in honour of the embassy from France in 1527. A full account of the festivities on that occasion will be found in the MS. of Cavendish's life of the prelate (Harl. MSS. No. 428). Twelve years afterwards an Act passed for enclosing a royal chase from out of several of the adjoining parishes. On the king's death some of the more odious boundaries were removed, in response to a petition of the neighbours, and the chase gradually took the form, so familiar to Londoners, of Bushey and the Home Parks. The office of chief steward or feodary of the manor, together with that of lieutenant and keeper of the chase, has always been conferred upon persons of high rank, as, for example, William, Marquess of Northampton; George, Duke of Buckingham; James, Duke of Hamilton; General Monk, Duke of Albemarle; Barbara, Duchess of Cleveland; the Earls of Halifax, the Countess of Guildford, and the Duke of Clarence.

Completing his quondam favourite's design, King Henry VIII. converted the palace into one of his frequent residences,—a predilection that was shared by many of his successors. Here were born, on the 12th of October, 1537, his son Edward VI., whose mother died within two days of his birth; and in 1689 Queen Anne's son, William, Duke of Gloucester; in the chapel Katharine Parr became Queen Consort. Queen Mary and her husband kept Christmas at Hampton Court in great state in the year 1558, as did her sister on two subsequent occasions. Here met the Council to condemn Mary Queen of Scots; and with her son as moderator the conference between the Presbyterians and bishops of the Established Church, which resulted in our amended Liturgy and a revised translation of the Scriptures. In 1647 the Commonwealth men brought a prisoner to the palace that monarch who had there spent some of his less anxious days. Not disdaining to make it a home, Cromwell here caught the ague which ended his life: here too his daughter Elizabeth married Thomas, Lord Falconberg, and Mrs. Claypole died, the only one of her race whose grave remains undisturbed at Westminster.

Consisting of five courts with the leading features of a chapel, banqueting-hall, and a fine Tudor gateway, the original building, in its extent the largest of our royal palaces, underwent considerable change at the hands of Sir Christopher Wren. For the inmost three courts he substituted the present Fountain Court with the fine range of State apartments overlooking the garden and the three beautiful avenues of King William III. beyond. In the second quadrangle, (known as the Clock Court, from the curious astronomical clock over the gateway) he placed an Ionic colonnade, which, harmonising but ill with the hall opposite, leads to the grand staircase and private apartments. The Fountain Court, measuring 110 ft. from east to west by 117 ft. from north to south, has a very pleasing effect; on a summer's day the view through one of the arches is charming. The Hall was manifestly not finished before 1536 or the following year: it is not mentioned in the manuscript cited above, and is ornamented with the initials of the king and Jane Seymour tied with a lover's knot, a device which is repeated in the west drawing-room or Board of Green Cloth, a large and contemporary apartment at its eastern end, as well as on either side of the chapel doorway. The Great Hall measures 106 ft. in length, 60 ft. in height, and 40 ft. in width; its modern stained-glass windows were intended to show, *more heraldico*, the descent of King Henry VIII. and each of his six wives from King Edward III. The Flemish tapestry on the walls, its designs attributed to Van Orley, tell Abraham's history. The chimney-piece and Wolsey's portrait in the adjoining apartment are comparatively modern. The Clock Court gateway is adorned with two of the terra-cotta busts removed thither from "Holbein's Gate," which formerly stood across the roadway at Whitehall.* By one of time's revenges the play of "Henry VIII.," with the downfall of Cardinal Wolsey, was performed in the Hall, which king George I. had fitted up in 1718 for stage plays. His successor was the last sovereign who lived here. This may be due to the circumstance involved in the following anecdote. It is related that the Duke of Sussex, passing through Queen Anne's drawing-room, said,—"I wonder in which of these rooms it was that George II. struck my father": the blow was so keenly remembered that King George III. never cared to live at Hampton Court. In his reign the private rooms were divided into suites of chambers, whose occupancy is in the gift of the Queen. Faraday resided here from 1858 until his death in 1867. In the person of Tobias Rustat, housekeeper at Hampton Court Palace and yeoman of the robes to King Charles II., a singular link exists between Hampton Court and the existing representatives of two other royal palaces. He gave to the nation the two best out-door statues of which London can boast,—those of Charles II. at Chelsea Hospital and James II. at Whitehall, both the work of Grinling Gibbons. Rustat deserves commemoration for his munificent endowments to our universities and other public institutions; a rival of Colston at Bristol, he gave away as much as 100,000*l.* during his life-time to educational and eleemosynary purposes.

The state apartments on the first floor around the Fountain Court ordinarily shown to visitors, include the guard and presence chambers, King's drawing-room, King William's and Queen Mary's bed-rooms, the Queen's drawing-room and audience-chambers, the dining-room, long gallery, with others. They are approached by the King's and the Queen's staircases, whose walls are an apt illustration of Pope's couplet,—

"On painted ceilings you devoutly stare,
Where sprawl the saints of Verrio or Laguerre,"

being decorated with the work of those two artists. It was in a room above these apartments that the fire broke out lately which threatened to extend to the rooms beneath and destroy the pictures they contain. On a careful examination a few years ago numerous errors in the titles of these pictures were discovered. The Raffaelle cartoons were not,—contrary to common belief,—in jeopardy, having been sent to South Kensington; but there remain the nine designs of Mantegna, painted upon linen, representing the triumphs of Cæsar. Nys bought these at Mantua in 1628. Amongst the more valuable paintings deposited in the galleries may be mentioned some genuine Holbeins,—Henry VIII. and his family; Henry Howard, Earl of Surrey; and Lady Vaux. There are some portraits by Titian, two by Vandyck,—King Charles I. on horseback, and Margaret Lemon,—a Velasquez,—Philip IV. with his queen; and himself with his own family, by Pordenone. By Zucchero there are Queen Elizabeth's porter (a fine work), and Mary, Queen of Scots. The marine subjects are worthy of mention, if only for the circumstance that one or two of them present curious evidences of the mode of handling our earliest artillery. One shows an engagement at which Mrs. Spragge, whose monument may be seen at Chelsea Church, fought beside her future husband for the space of six hours. In the Queen's Gallery are the seven tapestries designed by Le Brun, showing the career of the hero of Macedon. They were purchased in Flanders by General Cadogan, *temp.* George I. There are Venuses by Titian and Rubens, Madame de Pompadour by Greuze, Mabuse's Adam and Eve, which once occupied a rather conspicuous position in St. James's Palace; the meeting of Henry VIII. and Francis I. on the "Field of the Cloth of Gold" (from which picture our sovereign's head was cut to prevent its purchase), with examples of Rembrandt, Gainsborough, and West. Some old pictures are in the "haunted gallery,"—through which Queen Katharine Howard, escaping from her chamber, ran towards the chapel where the king was at prayers. But the guards repulsed her, and though her screams resounded through the building the king knelt unmoved. Her ghost may be seen hovering between the entrance to the royal pew and a side-door on the Queen's Great Staircase! In the first presence-chamber are the celebrated Hampton Court beauties, due to the brush of Kneller. The corresponding and equally celebrated series painted by Lely, who,—

"On the animated canvas stole
The sleepy eye that spoke the melting soul,"

and of which Walpole says:—"the beauties at Windsor are the Court of Paphos, and ought to be engraved for the memoirs of its charming biographer, Count Hamilton," † were removed hither from the Castle, where their presence was deemed to be little in accord with the manners of a later, and, let us hope, a more moral age.†

* When Holbein's, or the Cock-pit Gate, was taken down in 1750, the Duke of Cumberland, then Ranger of Windsor Forest, intended to rebuild it with embellishments in the Long Walk. His project failing, portions of the gate were worked up in various of the park lodges. Of its eight medallions of baked clay, glazed like Delft ware, three are preserved at Hatfield, near Witham, in Essex; they represent Henry VII., Henry VIII. when sixteen *ætat*, and Fisher, Bishop of Rochester, and were retouched by Flaxman when a youth. Two others are, as mentioned, at Hampton Court.

† "Anecdotes of Painting," vol. iii., p. 27.

† In vol. xli. of the *Builder*, p. 261 (August 27, 1881), will be found some curious information as to the cost of the erection of the Great Hall; and in the same volume, p. 445 (October 8, 1881), Hampton Court is compared with Versailles.

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CRITICAL COLUMN.

INTRODUCTION.

The evident revival of modern Classic architecture throughout the land is a phenomenon of most serious import. Silently and steadily the decried style is being reinstated, and the absence of organised propaganda, of powerful patronage, is of the most hopeful significance. The taste for Classic art is, in short, not being forcibly "revived"; it is itself "reviving" naturally, from grounds and reasons which have accumulated in the wake of time.

The style of the "Revived Gothic" which is just closing its remarkable career was eminently one of "restoration." It was the interest attaching to the decaying monuments of this art and the desire to see them preserved which gave the impetus to Gothic practice. Architects, draughtsmen, and mechanics soon become proficient, and if it was desirable to preserve "old monuments" of a particular style, why should not "new monuments" of this self-same style be erected? The reasoning was not illogical, but certainly inartistic. The same fault was committed which attaches to any and every "forced revival." Admirably grand and perfect as is the Gothic style in itself, and as a product of its own times, in its modern application it has failed to secure our sympathy to any large or lasting extent. For although it will lend itself readily to all modern requirements, although it is capable of much physical transformation, its *spirit* is felt to be out of time with our natures and the general temper of modern times.

Thus Classic architecture is reviving naturally. We feel it to be more "modern," more congenial; it offers at the same time many other advantages which we see and appreciate now that we have come to love it again as a style. It may seem strange to hear Classic architecture called more modern than the Gothic, and yet in spirit, if not in time, it is so. Classic art seems possessed of the spirit of eternal youth; fresh, vigorous, facile, adaptable, it is the only architecture founded upon purely æsthetic grounds, uninfluenced by dominating ideas of religion, state, morals, or physical agents. Such arts as the Egyptian, the Arabian, and the Gothic are deeply tinged and dominated by some emotional or physical influence, outside of the sphere of pure æsthetic perception; the idea dead, the style is dead, and nothing can revive it to intelligent life. We might erect ancient cities, or dress ourselves in ancient garb, and assume the corresponding manners, but this would not revive the concert of ideas and aspirations which belonged to either of the above periods of art, and gave them their character and value; we would but be "moderners," playing a poor comedy. It is different with Classic art, for, founded in its typical elements upon nature, and appealing to man's pure perceptive faculties, it is an art which rests upon a basis which never varies; it is always understood; it is living, growing, advancing with man. Hence, none of the Classic revivals have ever been sterile revivals; they have always accomplished something new and fresh, and each appears like the re-issue of imperishable principles from the mould of advancing time.

The modern Classic revival upon which we are just entering is, it is greatly to be regretted, being pushed with a hot haste and want of preparation which will for some time jeopardise its prospects and repute. Architecture is so much of a "business," and the dictates of fashion are so inexorable, that architects and draughtsmen, builders and mechanics, are, without notice, called upon to work in a style with which many have but a most rudimentary acquaintance. And as a style of architecture is not learned (to be practised with intelligence) in six weeks, nor in six months, nor in six years, the inevitable result is that the "style" is blindfoldly copied out of books and from existing old or contemporary works; features and details are "adopted" and joined together indiscriminately; grace, proportion, and tasteful handling of mouldings and decorative enrichments are but very rarely to be witnessed. It is in the detail, that test-point of Classic taste, where ignorance is especially displayed; the understanding for traditional types is lost, the eye and hand are unaccustomed to the nice discrimination of Classic forms and proportions. Witness, for instance, the chaste superiority of the older Classic monuments over our vulgar sprawling productions; the seriousness, the science, the deep art-intelligence of the former are painfully absent in the others. Students could learn volumes from the vestibule of Somerset House and the buildings of the elder Cockerell in the City, and even Burton's entrance to the Hyde Park is well worth a careful inspection. In composition, pure and as arising out of the plan, fewer faults are committed. The laws of composition apply with little variations equally in all styles of architecture, and the Classic lends itself with special facility to the free and liberal development and expression of the plan in the compositional features. However, even in these matters much bad work is done, bad especially in the way how it is done and the æsthetic means employed, which again leads to the subject of detail in the largest sense of the word.

From this general survey, the occasion may not appear inopportune to open this column for the purpose of a more vigorous and consistent criticism of contemporary work than at present obtains. In so doing, opportunities will present themselves, according to each specific subject, to dwell at length upon the many and varied matters which make up the body and soul of Classic art. It is believed that such a plan of critical comment presents many advantages in bringing home to the student more forcibly anything which can with profit be pointed out. Many lack the inclination and also the capacity to follow abstract expositions of the principles of design; it is dry and uninteresting reading to them. But were these matters developed on the basis of criticising actual London buildings, which the student would be very likely to go and see, these lessons would be conveyed in a manner more interesting and more direct. Architecture is, indeed, largely a contemplative art; it is nowhere learned so well as from a loving observation of its great monuments, provided we have in our souls the chords to be struck and the sentiments to be evoked. It would not be difficult to show that some of the greatest architects of all times, certainly all the really original and striking men, were not book-scholars. They studied, certainly, many deeply, all that can and must be learned from books, but they did not try to find in books what they can never contain,—living art. For real genius is too powerful a force to be long satisfied with the descriptions and definitions of beauty as distilled through the long-channelled funnel of reflective philosophy. Art and beauty, natural or created, are not reflective in character. They are contemplative, impressing; they appeal to emotions, temper, feelings, rather than to reason. It is the "picture" which fascinates our soul, and demands not what it is for nor what it is made of. Hence the way to really learn art is to "see and be instructed," to see with an open heart the beauty of nature and of man's creations, and to deduce from that your own philosophy. This is and must be the course of every architect's education, and those of superior gifts will find the path for themselves; but there are others, and many who enter our profession, with whom the thought and qualification for art are not the leading motives. To such, "art" does not come naturally, and they trust to learning what should be a matter of natural gift. It is those who, if not possessed of genius, may yet possess ability to do good work, who require guidance in their studies. They require their interest and sympathy to be enlisted, to receive hints and directions to enable them to feel their way in the right path, to form their taste on sound lines, and to exhibit it at last in good work according to their own individuality.

Some parts of the creed which is to be preached, and upon which the criticisms will be founded, have already appeared in the foregoing remarks. In all its details and bearings it can only develope itself in the substance of the specific articles, for it is well nigh impossible, as every writer knows, to state views on art in an exhaustive manner in the shape of a programme or abstract dissertation. The writer, however, thinks it well and also possible to declare himself somewhat more on the general tendency of his thinking. In the first place, he believes that there is too much licence, irrational toleration and want of harmony, in regard to architectural ideas and practice generally; a want of settled, positivist views in regard to the direction in which architectural work should move. This shows itself especially in the widely divergent views on architectural style. We have the Classic, the Gothic, the Renaissance, the Romanesque, the Japanese, the Constructional, the Eclectic, the Queen Anne, or specially-patented Æsthetic, all in vogue at one time, and respective adherents combat one another with vigour, sometimes with animosity. There are, on the other hand, those who have no definite sympathies of any kind, and who will, with the greatest alacrity, follow any and every style as fashion or business interests may dictate. This state of things shows, to the writer's mind, that the whole question of architectural style is deplorably misunderstood. The fight is about the shadow, not the substance, the shell and not the kernel, although it is that kernel which, like the soul to the face of man, gives life and intelligence to a style of art. A style should be regarded as the outcome of a variety of elements, some traditional, some original to the particular time in question, combined and moulded according to the spirit and temper, moral, religious, and political, of a time or race, and additionally influenced by climatic, material, and technical factors. Accordingly, there are elements entering the substance of a "style" which are not connected in any way with the attainment of physical or æsthetic beauty, nor with wise and economic construction, nor with practical convenience, but elements of sentiment and ideas, powerful forces of religious and moral tendencies, of political aspirations, of greed and conquest, of remarkable individualities like Alexander, Pericles, Catherine of Medici, Louis XIV., Napoleon the Great. Hence, a "style" is really more a matter of "interest" than one of abstract "beauty"; the attainment of æsthetic beauty may predominate, but need not; any one or any distinctive combination of the enumerated "possible" elements of a style may be the "sleeping," the life and character-giving force.

The æsthetic element certainly runs through all styles, but we find it strong and clear in the one, partly subdued and secondary in the other; in one it is the soul and all the melody; in the other but like a faint accord to accompany the dominating force. We see, therefore, that certain forces of architecture are essential ones, always present, more or less, in every style, while others are incidental ones, and, therefore, those which must account for the differences which we know as the distinguishing features of styles. These latter, though, are beyond our conscious control; no people and no time have ever consciously controlled the character-giving elements of their style. We cannot judge, or certainly not apply and direct, these forces to our own work, simply because we do not clearly know them ourselves; we lack control and survey over them because we stand within them. No people have, therefore, ever known, nor ever will know, "what style" they are working towards. For the attainment of the style, clear and well defined, is the very last result of years and centuries of half-conscious endeavour, of instinctive aspiration.

What we can and must do is to study and master thoroughly the "stationary" elements of style, which are nothing else but the principles of design as they run like a silver thread through the entire field of art. These principles are unchangeable, they rest upon man's intelligence and observing faculties; they exercised themselves first and attained high perfection in the practice of the many technical pursuits, and from which they were engrafted upon architecture as well-understood types of æsthetic expression. Joined to these there are those practical points of plan, construction, &c., which enter largely always, though in varying degree and manner, in the compositions of architectural art. If we could well study and master these matters,—if we could with intelligence gauge their proper positions and power in the various part styles, and arrive at a more correct understanding of the same,—we might push on our own work with confidence that we too were working towards a style which, judging from the general cast of modern man, we might reasonably hope will be no mean or insignificant one. This is the point of view which we must all reach, all deeply possess, before we can hope to work with promise toward a style of our own. We must become less of antiquaries and more of artists; devote our time less to the copying of the sterile forms of dead styles and more to the study of the continuous elements of design; we must, above all, become fully possessed of the fact that a style cannot be forced on, nor consciously developed. We can but carefully prepare and advance those elements which we

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can control; the rest must be left to the womb of time. Why then, it may be asked, should the Classic form of art be advocated in preference to any other? The reasons are two, clear and forcible, and which no amount of argumentation or individual sympathies can overcome. First. In periods of artistic or rather stylistic stagnation and collection, man requires to return for instruction to the spring of art-language,—to that art which illustrates in the most forcible, most direct manner, the great principles of design and æsthetic expression which run through and must form the basis of all styles. Second. That form of art is the Classic as it had filtered itself down to typical perfection from the work of ages in the styles of ancient Greece. The Grecian is the only purely æsthetic style in which "beauty" alone is the shape and character-giving element. It has crystallised down to tangible perfection for the purpose of architectural monumental use the variety of forms and types of art and design as they first exercised themselves in the technical arts and early forms of architecture; and it can be no accident that this work was done by the race who in every other respect excite our profoundest admiration. These types are like the imperishable stock-in-trade of every art; they are like the language with which we speak and must retain if we wish to be understood.

This is the spirit in which the writer advocates the study and resumption of architectural work on the Classic basis. He does not wish that either of the various forms of Classic or Modern Renaissance art be "taken up" and "developed"; such would be as contrary to his ideas as the taking up of any other style; he wishes to see Classic studied because it is the true monument of art, the best school to teach the materials required for a style. Every race or period must found its work on that model; in times of architectural exhaustion, of beginning fermentation, man must return to that fountain to refresh his spirits, revive his æsthetic faculty, and to collect materials and power for new work. Architecture is an art of re-issues, of re-developments, of traditional types and stationary perceptions founded upon man's general nature, which is unchangeable; they live in his recollection, now vividly, now obscured, but always the same, allowing but of slight modification. And, as nature, in all her variety and wealth, shows but very few distinct forms and types of expression, so true art is not founded upon multiplicity of means, eccentricity of invention, or studied variety, but upon wise intelligent combination.

The writer, therefore, welcomes the Classic revival, not for its immediate results, but for its opportunities. In taking it up we shall all, artists and public, go through a wholesome and promising course of instruction. In addition, there is something more congenial in the general temper of this art; we all feel instinctively that it is free from dominating influences, like the Gothic style reveals, and which are antagonistic to the cast of mind of modern man and his institutions.

We know that Classic, as the freer, more natural, more purely æsthetic style, offers less resistance to our attempt to engraft our own individuality upon the same, to vary the use of its features, to apply it to unusual or entirely new conditions. All these are matters which the electric spark of accident often shapes into unexpected revelations, all elements for a future style. In regard to compositional design, the writer would throw open the entire range of styles we know for eclectic application,—all those features, at least, which have force and reason independent of any particular detail, features, for instance, arising out of the liberal penetration of the plan into the composition. In general, composition is regarded too much as linked to particular detail; it is rather the detail which, while retaining its traditional character, may yet be modified to suit the requirements of compositional features. This was the process in Gothic architecture, also in Arabian, Moorish, &c. Composition is therefore really the free, nay, the very freest, factor of architectural design. It is, in addition to the previously-mentioned influences, the most powerful shaping-force of style. Composition, however, should, while offering every inducement to the imagination, retain the character of reasonable necessity, of exuberance tempered by at least the semblance of requirement. The plan and constructional matters intimately affect composition and style, but this influence must be subordinate to, and be dominated by, the general laws of design if we wish Architecture, and not mere prosaic building. The theory of modern times, that architecture as an art is the outcome of practical requirement and constructional necessity only, is radically wrong, most inartistic, unsupported by ancient art, and doomed to failure wherever consistently applied. Architecture is something besides "constructed art"; it is also æsthetic, also sentimental art, and its grandest productions are those which show its various possible elements combined by the spell of some dominating idea to a beautiful harmony.

It is precisely with the view to a tasteful future style that the position of the plan and of construction as elements of style should be rightly understood, for no time has been so fertile as our own in new developments, applications, and inventions bearing upon these matters. It will require all the study and skill we are capable of to enable us to master and solve, as true artists, the complicated task before us, and if we proceed to work on wrong lines and in a wrong direction, but shame and chaos can be the result.

As has been pointed out at the beginning, it is in the detail, elementary and compositional, where the contemporary-revived Classic falls short. The understanding for the traditional types of æsthetic expression, for mouldings, conventional ornament, &c., has been lost; the right use and function of many features, the value of proportion, the use and position of colour, &c., are to many a chapter of mystery, and it is believed that much light may be thrown upon these matters, and the general interests of real art-progress be advanced by the introduction of this "critical column" on the lines laid down in the opening statement.

SEMPERIAN.

AMERICAN ARCHITECTURE IN ITS CONSTRUCTIVE AND SANITARY ASPECTS.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary meeting of this Institute held on Monday evening, December 18, Mr. Ewan Christian, Vice-President, in the chair,

Mr. A. J. Gale, the holder of the Godwin Bursary for 1882 (the first year of its award) described what he had seen during his tour in the United States. He observed that at the invitation of the Council he ventured to bring before the Institute some account of his tour as holder of the Godwin Bursary for 1882, the first year of its existence, although he was obliged to admit his inability to do justice to the subject on account of its extent and varied nature. The tour covered a great deal of ground, and that he had been able to see so much as he had seen was due to the great kindness of many American architects. The tour occupied exactly three months, of which ten weeks were spent in America,—five weeks in New York and the remainder of the time at Philadelphia, Baltimore, Washington, Chicago, Detroit, and other cities. In New York at the time of his visit there were many vast building schemes in hand. Prominent among the matters to which he turned his attention was the work being done by the New York City Board of Health with the view of improving the tenement houses with regard to drainage and other sanitary arrangements. He had, however, dealt somewhat fully with these matters in the report which he had previously presented to the Council. Vast buildings let off as offices formed one of the sights of New York. Such blocks were continually being erected, and the most recent one generally managed to outshine its predecessors in some particular or other. Foremost amongst the works of this kind at the time of his visit was that known as the Mills Building (from the name of its owner, Mr. D. O. Mills), having frontages to Wall-street, Broad-street, and Exchange-place. The building, of which Mr. George B. Post is architect, was nine stories high above the ground level, with a cellar or basement story below. The basement, ground, first, and second floors contained strong-rooms for the deposit of books, securities, and other valuables. All the floors were intended for suites of offices, divisible by means of partitions into holdings of any required size. The lighting throughout he considered good and sufficient, though, judging from the plans, some of the rooms only had "borrowed light." The large entrance-hall was two stories in height, and it contained elevators or lifts constantly conveying passengers up and down, although the building was only partially completed and opened at the time of his visit. The entrance-hall, which contained a well-hole for lighting the basement, had a glass roof. The offices derived their light partly from the street frontages and partly from the lighting space or area over the roof of the entrance-hall. The height of the cellar or basement story was 9 ft., that of the ground-floor 13 ft. 8 in., that of the first floor 17 ft. 8 in., the height of the stories gradually diminishing from the second to the ninth story, which was 10 ft. in height. The walls were of brick, with red brick facings and stone and terra-cotta dressings. The general design consisted of a simple combination of vertical and horizontal lines, very effective and suitable for the purpose, the treatment of the detail generally being Classic. The roof was flat, constructed of rolled iron joists filled in with terra-cotta bricks in the form of voussoirs, and covered with cement. Roofs of this construction had been used upon almost all recent buildings of large size. The main stairs were entirely of cast iron, with the exception of the treads, which were of slate,—ironwork taking the place of wood in the construction of newels, strings, risers, balusters, &c. The internal partitions between the offices were built of hollow terra bricks corrugated externally to receive the plastering. To preserve the handsome hard wood dados from decay through damp from the washing of the floors, marble plinths were provided. He understood that the drawings for this building were prepared, and the building completed ready for occupation, within twelve months from the time that the architects received their instructions,—an illustration of the great rapidity of performance which was characteristic of American building operations. The heating of the building was effected by steam, on the direct radiation system, and the coils of steam pipes standing in the rooms formed by no means inelegant features. The system of steam heating by direct radiation seemed to find more favour amongst American architects than steam heating by indirect radiation, or heating by hot water or hot air. With regard to the apartment-houses of New York, Mr. Gale said he had entered somewhat fully into details in the report which he had presented to the Council. Many of these blocks of buildings in flats were eight or nine stories high, and those for the middle classes were constructed in the most elaborate manner, and provided with all the conveniences that modern construction could command. The construction of the tenement-houses or flats for the lower classes was under the supervision of the New York City Board of Health, who were empowered, under an Act passed in 1867, and amended in 1879 and 1880, to regulate the construction and sanitary arrangements of these dwellings, and the results which had been obtained under this administration were very satisfactory. Plans of all proposed tenement-houses had to be submitted for the approval of the Board, and careful attention to the observance of the Board's requirements with regard to construction and materials was enforced by a staff of inspectors. The higher class of houses in flats, known as apartment-houses, were subject to corresponding restrictions. These buildings were provided with handsome entrance-halls and elevators, continually running up and down. The best arrangement of plan for these buildings was obtained by grouping round a compact central hall,—not too large, in fact, hardly more than a large lobby,—four or five dwellings or suites of apartments. The servants' rooms were kept quite apart. An entrance-court, formed in the basement, and easily entered by tradesmen's carts, gave access to the servants' elevators. This court, which was well lighted and ventilated, was for the most part covered with a substantial roof, the top of which formed the court-yard or carriage-entrance for the residents. The floors were mostly of fire-proof construction, consisting of iron joists filled in between with hollow arching blocks, the ironwork being protected above and below, and joists being laid on the top surface of these fire-proof divisions. Most of these buildings were constructed externally of brick, with stone dressings. The roofs were flat and of fire-proof construction, and the heating was effected by steam on the direct radiation system. Fire-places were, however, provided as well. The wood-finishings were generally

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good. Some of these blocks of apartment-houses were built by associations of intending occupiers, who were thus able to provide themselves with exactly what they wanted, and at the same time to be able to choose their neighbours. The plumbing and house-drainage arrangements of New York were also under the control of the City Board of Health. Under their Plumbing Law, dating from 1881, all plumbers had to register their names and addresses, and had to submit sketches and details of all works proposed to be executed by them. The chief point in which the regulations differed from the most advanced English views at the present time was in regard to the material to be used for soil-pipes, which in New York were required to be of iron, which must be properly jointed, and coated inside and out with coal-tar pitch applied hot, except where enamelled surfaces existed. The other rules insisted upon by the Board did not differ much from those observed in the best English practice, but there was a thoroughness about the inspection, and an amount of attendance to minor details, which were far in advance of the supervision of an average English local board. Every precaution in the way of ventilation and the prevention of siphonage was rigidly insisted upon. The Durham House-drainage Company, of Chicago, contend that as it is worth while to convey coal-gas in wrought-iron mains with screw-joints in order to prevent leakage, so it is worth while to prevent the escape of sewer-gas by the same means. This Company uses wrought-iron pipes with screw-joints for soil-pipes, which are strong enough of themselves to carry the entire weight of the closet apparatus without any support from the building. By this means, it is urged, all danger of leakages owing to settlements is completely avoided. For the horizontal or drain-pipes, this company uses cast-iron socket-jointed pipes, the joints being made with lead. These iron drain-pipes could be, and often were, suspended from the under-side of the ground-floor of a building, and were provided with movable caps to allow of inspection or cleansing, if necessary. This system of house sanitation had been adopted in a town built by Mr. Pullman, of sleeping-car fame, for his workpeople. In Chicago and Boston, as well as in New York, great attention had been paid of late years to the ventilation of public buildings. The Fifth Avenue Presbyterian Church, New York, better known as Dr. John Hall's Church, was one of the most successfully-ventilated buildings in the world. It was erected from designs by Mr. Carl Pfeiffer, and was pronounced by Captain Douglas Galton to be the best ventilated church he had seen.* The Madison-square Theatre (of which Messrs. Kimball & Wisedell were the architects) was also very effectually ventilated on the same principles. The most important work now in progress in Philadelphia was the immense block of public buildings to contain the various municipal offices. The buildings occupy a nearly square site, the two frontages from north to south measuring 486 ft. 6 in. and the two frontages from east to west measuring 470 ft., the area of the site being 4½ acres in extent. The offices are grouped round a huge quadrangle. The large tower in the north front was 90 ft. square at the base, and it was proposed to carry it up to a total height of 535 ft., it being surmounted by a statue of William Penn 36 ft. in height. The following were some of the other dimensions:—Height above pavement-line to centre of clock-face in tower, 361 ft.; diameter of clock-face, 20 ft.; height of upper balcony, 296 ft.; total number of rooms, 520; total amount of floor area, 14½ acres; height of each centre pavilion, 210 ft. 10½ in.; height of corner towers, 161 ft.; height of basement story, 18 ft. 3½ in.; height of principal story, 33 ft. 6 in.; height of second story, 35 ft. 7 in.; height of third story, centre pavilions, 26 ft. 6 in.; ditto, wings, 24 ft. 3 in; ditto curtains, 20 ft. 5 in.; height of attic of centre pavilion, 15 ft.; height of attic of corner towers, 13 ft. 6 in.; height of figures on centre dormers, 17 ft. 6 in.; height of figures on corner dormers, 12 ft. 10 in. The substructure was of fine white granite, the superstructure being of white marble. The tower was to be built of squared dimensioned stones, weighing from two to five tons each. It had not been attempted to make the building fireproof in the sense of protecting all the constructional ironwork. The building was being erected from the designs of Mr. John McArthur, architect, under whose superintendence the sculpture and carved work in general were executed after models prepared on the spot. Mr. McArthur's designs were selected in competition in September, 1869, and the building was commenced early in the following year. The total amount spent upon the building up to 1879 was $5,000,000, and the estimated total outlay was $10,000,000.* The new Post-office at Philadelphia was next described in some detail by Mr. Gale. It is being erected under the superintendence of Mr. James G. Hill, Supervising Architect to the Government. The drawings for this and similar buildings were made in Washington, where architectural matters formed a branch of the Treasury Department. Mr. Hill's last annual report showed many court-houses, post-offices, custom-houses, and the like, in course of erection, each under the care of a competent official architect. The essayist then proceeded to say a few words as to the Johns Hopkins Hospital, Baltimore, which he said was one of the most interesting buildings of its kind in the world. This building was the result of a study and examination of all the chief hospitals in Europe, by Dr. Billings, of the United States National Board of Health, who was selected for that purpose under the will of the founder, the late Mr. Johns Hopkins. The architects were Messrs. Cabot & Chandler, of Boston, and Mr. Niernsee, of Baltimore, the last-named gentleman being the consulting architect. Mr. Gale, in conclusion, noticed the methods of constructing iron-fronted buildings, and described the precautions which were being taken in Chicago, Boston, and other large cities against the recurrence of such disastrous fires as those cities had experienced of late years. Several methods of fireproof construction were described, including the one which is being applied by a company under the management of Mr. Wight, formerly an architect.

The Chairman, in inviting discussion, said he thought Mr. Gale had shown that he was a very proper holder of the Godwin Bursary, and he had given them a large mass of information which it was not easy to digest all at once. When Mr. Gale was describing the immense public buildings of Philadelphia, and the enormous scale upon which everything was being carried out in them, he (the Chairman) felt very much like one of the inhabitants of Lilliput. He was reminded of what Professor Cockerell was very fond of dwelling upon,—the description of the stones which were used in the building of Solomon's Temple,—"great stones," "large stones," "costly stones." The new public buildings in Philadelphia resembled Solomon's Temple in another particular, viz., in the fact that every stone and every part was prepared ready for fixing before coming on the site. There was a great deal to be learned from the doings of American architects, as detailed by Mr. Gale, and from personal observation during a visit to America he (the Chairman) could fully confirm a great deal that had been said by the essayist.

Mr. John Slater said it seemed to him that America was the country, *par excellence*, where suggestions were to be picked up by architects. To put the matter colloquially, it was the great place for "tips," and there could be no better place for an architect to visit than the States, after studying on the Continent of Europe the artistic and archæological sides of his profession. The Americans were, in fact, so ingenious that their ingenuity was catching, and it appeared to be impossible for any one to visit the States without deriving much instruction. As a proof of this assertion, he mentioned that some time ago he was superintending some work where the builder's foreman was a man who had visited Chicago, and spent some time there in working at his trade,—that of a carpenter and joiner. A very excellent foreman he was. Like Ulysses, he was fertile in resource, and altogether he was a very different sort of man to the average builder's foreman. It appeared to him (the speaker) that builders and builders' foremen were the most conservative men that it was possible to come across. They seemed, almost without exception, to think that what was good enough for their fathers was good enough for them. As a rule, they had very little idea of the scientific principles of building construction. The consequence of this state of things was that if an architect wanted to do anything out the ordinary way it was very difficult to get it done properly. It resulted from this, again, that architects were, in a measure, in danger of confining their work too much in one groove. For these reasons he looked with great delight upon the institution of the Bursary which Mr. Godwin had been good enough to endow, for by its means they would be enabled to get a practical knowledge of a great many of the constructive and other details of the architecture of other nations, and should be taught the wholesome lesson that everything English was not necessarily the best. It was only with regard to what might be called the constructional part of an architect's profession that he made these remarks, for he thought that the attempts which had been made of late years to evolve what had been called a "Victorian" style had not been very promising. The chief points observable in American architectural practice were the means that were taken for economising labour and for utilising waste products. Of course, those results were largely due to the fact that in a new country, where labour was scarce and therefore costly, it was necessary to devise labour-saving machines. To take the use of the telephone as an instance, he believed that in America there was hardly a town of 6,000 or 7,000 inhabitants that was without its telephone exchange, and the amount of time and labour saved by that one appliance alone was prodigious. With regard also to electric lighting, the practical adaptation of that means of illumination was very much more largely developed in America than in this country. Then again with regard to the utilisation of waste products, great strides were being made in the United States. He was reading only last week in an American scientific paper how a large manufacturing firm had hit upon a means of condensing the smoke from their furnaces, with the result that from a million cubic feet of smoke they had been able to extract 4,000 lb. of acetate of lead, 70 gallons of alcohol, and some other useful products, the gain achieved representing not only the value of the products so saved, but including, of course, the preservation of a purer atmosphere. These were only a few of the ways in which the Americans were turning their ingenuity to account. He should have been very glad if, among the other subjects which Mr. Gale had been able to study, some mention had been made of the educational buildings of the States, to which great attention had been paid. A few months ago he (Mr. Slater) received from the Educational Bureau at Washington a treatise on rural school architecture, showing the best means of planning, building, ventilating, and warming such schools, on which, as a rule, only a very limited outlay was possible. In the treatise the scientific laws of ventilation were precisely laid down and illustrated, and altogether the little book was one of the most useful of its kind that could be conceived. If in this country our own Education Department would issue such manuals great good would be done, if only in preventing School Boards from laying down such absurd conditions as were sometimes imposed by them upon architects whom they invited to send in competitive designs for schools. The treatise to which he referred was issued in 1880, and it was stated in the preface that it was hoped to issue further publications dealing with the construction of high schools, academies, and colleges,—in short, with buildings for what we called secondary education. He begged to move a vote of thanks to Mr. Gale for his paper, and he thought that the Institute might be congratulated upon the first results of the Godwin Bursary.

Mr. H. McLachlan said that as an unsuccessful competitor for the Bursary last year, he had much pleasure in seconding the vote of thanks to Mr. Gale, who had evidently made good use of his time and opportunities. It appeared that in America there was great variety of materials; for, besides stone, brick, and wood, iron was also used for the fronts of buildings. It would be interesting to know a little more as to the manner in which buildings of iron and wood were protected against injury resulting from the extreme climatic changes experienced in North America. How was it possible to warm the buildings which were constructed on what had been spoken of as the "iron shell" method? If he understood that

* See *Builder*, vol. xxxiv. (1876), pp. 193, 195, for view and plans of this church, together with description of warming and ventilating arrangements.

* A double-page view of this building, and some additional particulars, will be found in the *Builder* volume for 1876, pp. 712, 715.

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mode of construction, the front of the building consisted for a large part of its surface of a mere skin of iron, which would afford little or no protection against extreme external cold or heat. It was well known that the old abbeys of Britain, where the walls were very thick, were warmer in winter and cooler in summer than buildings whose walls were of the thickness now commonly used. With regard to the methods of fireproof construction which had been described, it appeared to him that there was danger in covering up the structural ironwork in the manner described, inasmuch as iron was, as everybody knew, liable to decay by rust, and it was, therefore, advisable to be able to get to the ironwork to inspect it occasionally, so as to judge of its condition. But by the means of covering-up which had been described, such inspection would be impossible. Mr. Gale was to be congratulated on having got together so many drawings explanatory of what was being done in America.

Mr. W. Woodward expressed the hope that, as the paper was one of great interest and practical value, the Council would publish an adequate number of the illustrations to accompany it in the "Transactions."

Mr. Andrew T. Taylor said that as he had just returned from a visit to the United States and Canada he should have much pleasure in supporting the vote of thanks. He could heartily endorse what had been stated by Mr. Gale as to the activity and energy which prevailed in America with regard to architectural and building matters. Great progress was being made by the architects on the other side of the Atlantic. A few years ago it was the habit of all architects in this country to say that no good thing architectural could come out of America, and the works of American architects were, as a rule, looked upon with contempt. But that feeling was fast dying out, for within the last three or four years the strides that had been made by American architects on the artistic side of their work were something wonderful, especially in regard to private residences. Within the period named there had been built in Boston, New York, and elsewhere, houses which, from an artistic point of view, it would be difficult to surpass, even in London. The Americans spent large sums of money on the interior finishings of their houses. They frequently spent 60,000*l.* or 70,000*l.* on the interior of one house. The fittings and joinery were generally of hard and costly woods, and the buffet was very often a part of the construction of the house. Two of the most noticeable and costly houses which had lately been erected were those of Whittier, the poet, and Mr. Vanderbilt. A visit to the mansion of Mr. Vanderbilt, he was bound to say, was somewhat dazzling, so costly and rich were all the finishings and "appointments." Indeed, it was said in New York that several tradesmen had made their fortunes simply out of the furnishing of this mansion, which, by the bye, had for its principal entrance facsimiles of Ghiberti's celebrated gates of the Baptistery at Florence. As to the cast-iron construction of house-fronts, he (the speaker) had been much disappointed with it. He was in hopes that the Americans would have succeeded in evolving a style which would have been suited to the characteristics of the material, but all their attempts seemed to follow more or less closely the lines of stonework, and being shams, they were, of course, failures. One of the most striking features to be observed in connexion with the lofty buildings of New York and other American cities was the very general use of "elevators," or lifts, as we termed them. One or more of these elevators was to be found in every building, and being always in motion there was no waiting by passengers who wished to ascend or descend. The more general adoption of elevators or lifts in London buildings could not but be attended, in his (the speaker's) opinion, by great advantages, foremost amongst which would be the realisation of rents for the upper floors of lofty buildings almost equal to the rents now obtained for ground or first floor suites of rooms. With regard to the Philadelphia public buildings, the lofty tower described by Mr. Gale was not yet built, and it was doubtful whether it ever would be built. The buildings themselves were very French in general massing and grouping, and their architect had evidently made particular study of the Tuileries, Louvre, and the new Hôtel Dieu. The detail, however, was indifferent, though not so very bad for America. The detail of the new Post-office at Philadelphia, and of some other Government buildings in the States, was very poor, showing great poverty of invention. The explanation of this would appear to lie in the fact that all these large buildings were designed at head-quarters in Washington. He agreed with Mr. Gale that many of the large apartment-houses of New York exhibited great ingenuity of planning, and he was able to corroborate all that had been said as to the use of the telephone and other labour-saving appliances.

Mr. Gordon Smith, architect to the Local Government Board, said, with reference to the way in which things were managed in New York and other cities with regard to plumbing and drainage, that he thought it just possible that if all regulations for such works in London were administered by one central authority, such as the Board of Works, we might be able to do better than we now did. But he should like to know from Mr. Gale whether the Boards of Health of New York and other cities were harassed by the operations, just beyond the confines of the areas under their administration, of such a being as our own "jerry" builder?

The Chairman, in putting the motion, said that, having had the advantage of travelling in America, though only for a short time, he was very much impressed by the "go-aheadedness" of the Americans. If a man in the States brought out a good invention connected with building or anything else, it was straightway adopted all over the country until something better was produced, when that, in its turn, was taken up. The Americans did not wait, as we in England did, for things to be perfected before they used them. The telephone, for instance, had been in common use in Detroit for two or three years, and householders who needed the services of butcher, baker, or doctor could, by making their desire known to the officials at the telephone exchange, be "switched on" to the wires connected with shop or surgery, and so could give their orders or ask for advice without leaving their houses. Take, again, the electric light, which had been in general use in Detroit for years, although the English were still waiting for it to arrive at perfection before adopting it. With regard to the subject of ventilation, as carried out at Dr. Hall's church, he (the chairman) could fully confirm what had been said by Mr. Gale. The only quarrel he had with the church was that it was too luxurious, for every person was provided with an easy chair. Not only in regard to ventilation, but in the matter of acoustics, Dr. Hall's church appeared to be perfect. It was built for a congregation of 2,000, but in a building of the same size we in England would pack at least 3,000 people into it. As to iron for the fronts of buildings, he was sorry to hear that his nephew (who was his pupil twenty-eight years ago) had become such a heretic as to adopt iron fronts. He had not done so when he (the chairman) visited Detroit. Long ago, in New York, the enormous store belonging to A. T. Stewart & Co. was entirely built of iron, and it was the most horrible and bald-looking building that could be conceived. With regard to comfort in dwelling-houses, in the coldest weather the indoor temperature was equably maintained at from 65° to 70°. The walls of the houses were so constructed that the occupants did not suffer from changes of temperature, as we did in this part of the world.

The vote of thanks having been agreed to unanimously,

Mr. Gale, in reply, said he was unable to say whether there were jerry builders round about New York. If there were, he did not seek out their works as objects of study. As to iron buildings, it should be remembered that there were two methods of using it, one of which was seen in Stewart's store, where the entire front was of iron treated in imitation of stone, having columns of Classical character and elliptical arches,—the whole design being as unsuitable as it could be for iron; but in New York and other cities a better method of treating an iron-fronted building had sprung up, and he might plead for Mr. Gordon Lloyd to Mr. Christian and others that Mr. Lloyd's iron-fronted buildings were not attempts to reproduce architectural features in an unsuitable material, but they consisted in a combination of vertical and horizontal lines, with ornament which was suitable to cast iron. With regard to the heating of buildings, it was effected in various ways, as by direct and indirect radiation from steam pipes, by hot air, and by hot water. As to the heating of the iron shell buildings to which Mr. McLachlan had referred, there was no difficulty whatever, for between the external skin of iron and the internal walls air-spaces existed, forming, in reality, a kind of hollow wall. Buildings, of course, suffered from great extremes of temperature, but so far as he could judge, the joints were so well lapped and checked in various places that they effectually resisted changes of temperature. With regard to the fire-proof encasement of iron columns and girders, the enclosing materials hermetically sealed up the ironwork, it being believed that where the air could enter fire could also make its way. Hence the ironwork in buildings so fireproofed was not likely to suffer from rust. He was not concerned to defend the detail of the Post-office at Philadelphia, but it ought in fairness to be said that other Government buildings erected under the superintendence of Mr. J. G. Hill displayed an amount of artistic taste considerably in advance of some of the buildings put forward as specimens of Government architecture. In conclusion, Mr. Gale said he agreed with a former speaker in commending the ingenuity of plan shown in the New York apartment houses, which were well worthy of study in this country.

THE LARGEST GREEK TERRA COTTA.

IT was announced some time ago that the Russian diplomatist, M. de Saburoff, who is noted as one of the most successful collectors of ancient Greek works of art, had come into possession of a terra-cotta statue of unusual size and value. At a recent meeting of the Berlin Archæological Society, M. de Saburoff showed two photographs of the relic, one of them representing the entire statue, and the other only the head; and the celebrated Greek scholar, Professor Curtius, availed himself of the opportunity of pointing out the peculiarities and value of the original work. This terra cotta is quite unique, both in its dimensions and in point of artistic execution. It was obtained from Corinth. It is one-third of life-size, and represents a youth leaning at ease, like the Satirus of Praxiteles, on the trunk of a tree. The statue is treated quite after the terra-cotta style. At the back there is the large opening which is commonly found in such works, and the purpose of which was to allow the escape of the excessive heat during the burning process. The whole stamp of the work strongly reminds us of the manner and style of Praxiteles. On the whole the statue is well preserved. The left shoulder is elevated, and the right hip and leg stand forward as in the Hermes of Praxiteles found at Olympia. The figure, too, shows the same inclination of the head, and the countenance the same expression of rapt enthusiasm or reverie. Not only does the general treatment of the body remind us of the Hermes, but also many of the details, particularly the short hair growing up over the brow and the treatment of the drapery falling down in perpendicular folds over the support on which the left arm rests. There are still clearly preserved many traces of the original colouring of the statue. The nude body was flesh-coloured. There are remains of the dark colouring of the hair; and in the hair there are still traces of a wreath, though its particular botanical character is no longer ascertainable. What name the statue bore, or what it is specially intended to represent, is also as yet a secret. As compared with the Hermes, the figure impresses us with its exceeding softness, with the almost feminine character of the pelvis formation, and the position of the feet. It is certain that this terra cotta belongs to the period immediately following the great statuary works of the fourth pre-Christian century, and it shows clearly how the spirit of Praxiteles had stamped itself on the succeeding age.

Lifts and Grilles.—Messrs. Clark, Bunnett, & Co. (Limited), of Rathbone-place, have instructions from the committee of the West London Hospital, Hammersmith, to fix one of their patent direct-acting hydraulic lifts to the new wing of the hospital now in course of erection; and this company are also fitting wrought-iron grilles to the whole of the internal shops, and large portcullis gates, weighing about 3 or 4 tons, to the main entrances of the new Central Fish Market, Farringdon-street, the latter being worked by hydraulic power.

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THE FOUNDATIONS OF ART IN ARCHITECTURE.*

It is said of the greatest living master of military strategy, that he is "silent in seven languages,"—a pretty plain suggestion that, in military matters at least, he who speaks the least is likely to know the most. In matters architectural there is some analogy; for at this moment the architects who are producing the best work in England seldom or never make a speech or deliver a lecture about the things they know so well. Among such I could mention several able to tell you more than I am likely to do to-night. But you have chosen to invite me. Your excellent secretary conveyed your wishes in so exceedingly graceful a manner, that an immediate refusal must have savoured of churlishness. I afterwards failed to frame a sufficiently polite "No," and, further, I felt that if the architects of Leeds wished to hear a word of warning and encouragement from a brother North-Countryman, it became, in some sense, a duty to give it. I stand before you, therefore, with some reluctance. I have always grave doubts whether silence and close devotion to work are not the architect's true course. He speaks best through his works. I never heard that Giotto made a speech or wrote anything about architecture, although in his works he is one of the greatest preachers that ever lived. If the attainment of the highest excellence in art be our goal, the race is certainly not to the talker, though from time to time prizes and popular favour be won by him of the greatest noise. He, indeed, may secure temporary fame, and leave bags of money to his heirs. The patronage and applause of the ignorant should never be the architect's aim. He alone wins who has done his work right well,—who leaves behind a record of lofty thought in buildings, and who has succeeded, during his short span of life, in carrying the principles and practice of his art one step forward.

There is another side to the question. Something is due to our brethren,—something necessary towards the public. The aid of language and of public speech cannot be denied to any of the arts, and in reference to architecture it is perhaps essential. Our honest British public cannot read fine art in architecture, like the old Athenians, partly (as some snarling critic will say) because they are not accustomed to have such fine buildings set before them. At any rate, at present they must be instructed through the ear, or their eyes will admire the things they should not. And none but architects can give such education, or can help forward a public desire for better buildings fitly allied with painting and sculpture.

The present time is peculiarly one of talk, rather than of literature, especially so far as we are concerned, for little of it smacks of letters. The whole status of architecture, as a profession, and as an art, has probably suffered from the too great reticence of its leading members. It is fair to judge of this by public estimation, and if we compare the position of architecture with other professions, Law or Medicine, we have cause to deplore it. No man of rank, however poor, has thought it desirable to join this the oldest profession, which ancient Egyptians allowed none but nobles to enter. We have no representative in Parliament. No living architect carries the honour of baronetcy. One only that of knighthood, for political reasons. On the other hand, architects have allowed the bulk of the ordinary buildings to drift into the uncontrolled and vulgar hands of speculative builders, and, on the other, into the hands of special constructionalists eschewing art and calling themselves "engineers." There is no reason why the best architect should not also be the best engineer of his time, like Leonardo, or, at least, why mere constructionalists, who have no higher aim than the desire to exhibit mechanical skill, should not be allied to men possessing knowledge of art.

Now, if we wish to raise the whole tone and status of the profession, how is it to be done? Surely, first of all by becoming better architects and artists ourselves. If we wish to see art advance in our own case, what should be our first step? Surely to abandon copyism. When we have done ever so little a bit of true designing by ourselves, we are in a fair way to do better. So long as we merely copy the productions of others, our life, as true artists, has not even begun. This may sound hard. But it is true. For well-nigh two centuries we have accustomed our British public to the spectacle of unblushing copyism, and now it is taken for granted. Modern architecture has scarcely yet awoke from its condition as a daily lie, and the world has not yet begun to suspect it of truth. When a new building is finished, architects and newspapers unconsciously assume its pinchbeck qualities, and speak of it as "Gothic of the thirteenth century," "Greek," "Elizabethan," "Queen Anne," &c. Turning over the pages of a dictionary, one of the best in the language, I recently came upon this definition: "An architectural construction, in the artistic sense, must possess not only utility, but beauty, and also unity; it must be suggestive of some idea, and referable to some model." Thus, after pretending to describe architecture "in the artistic sense," good sirs, it finally, and in five words, denies it all position as a living art. When a man asks me what style such and such a building of mine is in, I know that he means,—"What past style have I been copying?" So I generally tell him I do not know, for, in his frame of mind, he cannot understand any other reply. Copyism in architecture is just as worthless as it is in pictures. Neither more nor less. Style, as applied to modern work, always means copyism. Our first step must be to set our faces like flints against it.

My hope for the future of English architecture really lies in the younger generation who are coming on. Their life is before them. Let them begin at the beginning. Let them know their construction and the right use of every material with which they have to deal. Let them always, from their outset, work in a true, honest, simple, real way. Let them study sculpture in its relation to buildings, and even essay to do some themselves. Let them cultivate an eye for colour. Then, perhaps, in course of time far hence, style may have come to mean, as it should, a thing of the past, and the day of truth may have dawned. If every man were working in this spirit, by degrees the public might perchance take an intelligent interest in new work, now unfortunately diverted to the damage and destruction of old, and in course of time, a real school of English architecture might again blossom into life.

Thoughts like these were passing in my mind when asked to fix the title of to-night's address. And it appeared to me that I should rather say something to set you thinking, something having for its object rather the kindling higher of such fire as may be in you, than to rattle the T-square and compasses in the approved method of the British architect; most lectures about architecture are either purely historical, and, therefore, need never have been written, or, they consist of well-worn platitudes which, also, you can string together for yourselves out of any architectural library; I have elected to forget technicalities and to avoid the usual architectural jargon. You shall hear nothing of antæ and responds, triglyphs, or tracery from me. Of bewildering and fruitless theories as to this method of construction, or that style of architecture, I shall say nothing. Whether I care most for Greek or Gothic, Queen Anne or Chinese, you shall not know. For the study and dissection of any of the past styles of architecture, I leave you to Vitruvius or Fergusson, Viollet-le-Duc, or Burckhardt.

The title I have chosen is far-reaching, and might be made to cover much more than the limits of a short address will allow. It is not, however, the material "foundations," the concrete and footings, which will claim your attention, however necessary these be to good building, but rather the higher things on which good art must rest when mere building begins to be architecture. In a word, my aims are directed towards the future. The dead past may bury its dead. Let us study the past, diligently and laboriously, so far as we can learn from it. I should be sorry to be misunderstood on this point. The most scholarly architect is likely to be the best. But when we come to our own work, after having studied well the past, let us abandon copyism and apply living principles. In this view I have for some years urged the importance in architecture of three things, viz., good form, good proportion, and good colour, and, I am fain to believe, not without some results. These standards or tests, by which we may from time to time judge our own work and see wherein we have failed, are of more practical use than thousands of pompous platitudes. It is our business first of all strenuously to lift higher and higher our ideal of art. If we are honest workers, our own judgment unflinchingly given on our work should be the only one we really care for. What are loosely called matters of taste are clearly and definitely matters of knowledge, better known to the artist than to the critic. To-night, therefore, in the hope that what I have to say may be of some use, I propose to set before you three other things of great moment to architecture, over which you may chew the cud, and by whose aid you may hold the mirror up to nature. In the modern rush of thoughtlessness, commonly called progress, they are apt to slip out of sight. I name them Truth, Intention, and Rigidity. The first is the starting-post. The second marks the course. By the third you must be judged in the race as by your conscience.

It is ever to be remembered that we, as masters in our craft (I dare not say masters of our craft), are exponents of the age in which we live as well as of the art which we practise. The history of architecture is the history of the world, unbiassed by the leanings of the partisan. It is the handwriting on the wall. He who would know his history aright should also learn to decipher the lessons of contemporary buildings. At the present moment each of us in his own way is unconsciously writing chapters in the history of England. We speak in different languages, some Gothic, some Classic, others perhaps, only a lingua-franca, or even broken English, and frequently fail to grasp one another's full meaning. But what we have to say is recorded in brick, or stone, or marble, and we can never escape the responsibility which attaches to this kind of public writing. It must stand as a monument illustrating the condition of art at the time, and, in its knowledge or ignorance, must either lend additional lustre to a country of which we are all proud, or stamp it with more or less of degradation.

I. TRUTH.

This brings me to the consideration of my first principle, Truth. Whether we speak merely of the right use of material in building, or carry the principle further, truth, all-pervading truth, is as essential to good architecture as it is to moral character in the man. It lies at the root and foundation of all things in architectural art. At the risk of exciting a suspicion that, after all, I am about to deal in concrete and footings, I must first emphasise the importance of truth in the treatment of every separate material with which you have to deal. I do not mean that you are to reveal all the anatomy of your buildings, exhibit all your ugly beams, and notch and stop-chamfer the edges of your doors. Some methods of early workmanship in England have become obsolete. The craft of the joiner, for instance, has certainly made progress since the thirteenth century. I fear I cannot be so sure about that of the stonemason. Our work, or the study of any branch of it, can never be so humble as to be unworthy of being done rightly or studied completely. Old George Herbert well expresses the principle when he says, "Who sweeps a room as in Thy sight, makes that and the action fine." It is in this conscientious sense that I wish to bring you down first of all to the artificer's level as to a foundation, and to impress upon you the importance of knowing some of the secrets of each trade. If you wish to design in stone or brick, wood or iron, brass or leather, silver or gold, you must first learn to be, to a considerable extent, at home in the true workmanlike treatment of your material. Without knowledge of these and adherence to their truth as to a sheet-anchor, there can be, in point of fact, no true design. Your most brilliant ideas, your most beautiful thoughts, can never be grammatically spoken into life and given to the world. The words halt, the speaker stutters, the point of the discourse is lost, and even wanders into quite other themes. I say emphatically that all our beautiful drawing and designing will fail in the final result unless we take heed to this. If ever we are led to admire a noble work belonging to ancient times (I leave the choice to yourselves), and are thinking of the higher qualities of the art displayed, let us pause and look deeper. We shall always find this principle lying at the base. It implies the matured skill of the craftsman possessing traditional knowledge of his material. It involves the incapacity for lying, for torturing the products of nature, or for pretending that your work is something better than it is. In modern times workmen have lost it quite, while many architects only grope

* An address delivered before the Leeds Architectural Society by Mr. Edward Robert Robson, F.S.A., December 4, 1882.

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after it. I have occasionally, in out-of-the-way villages, found workmen who had not lost the traditional workmanlike instincts of their craft. But they have been rare. Nearly two centuries of deadness in art, the introduction of the system of building-contracts, and the development of trade-unions, founded only on greed and not to advance knowledge, have done their deadly work. And it is sad to reflect that the English handicraftsman is no longer what he was. In each walk it had taken generations of workmen, in the various trades, to arrive at their extraordinary skill. From time to time it was no uncommon thing to find that one of the more specially skilful had imbibed so large an instinct for first-rate work and love of his craft that the power of design seemed to come to him and he often carried his work into the very realms of art itself. Times are now changed. The workman so little understands the position, and the imminent danger he runs of being superseded on all hands by the foreigner, that he now does not even see the importance of his son serving a regular apprenticeship to his trade. Some attempts are being made to counteract this evil, and technical schools will, doubtless, soon be found in every centre of population in England. With all their value they can never supersede the necessity of apprenticeship, and the imperative duty of acquiring that intimate acquaintance with craftsmanship which is never acquired except through the fingers' ends.

I am scarcely prepared to assert that every architect of the future should enter the portals of the profession through the builders' shops, as I myself have done, though I am ready to admit that it is a very good way. Nor am I prepared to lay down that good architecture can alone spring from the artistic instincts and skill of the workman. There must ever be the controlling mind. There is so much, beyond the workman's knowledge, to be acquired in our profession, that a man's life seems all too short to compass the wisdom of the ancients, the cunning of the craftsman, and the habit of creative design. Our art cannot in these days be left to workmen. The time is yet far distant when architects can be dispensed with. But there is no hope of seeing penal laws in force against the speculative builder or the slovenly workman until every architect in the land himself knows his work and has made himself worthy of his name. Of one thing I am sure, viz., that a much more intimate, close, and accurate knowledge of materials is a vital necessity to architects themselves if the workman in his work is to be lifted higher and higher, so as to become a true exponent of artistic thought in building. When we once fully realise that, for the most part, the British workman seeks to get through his work as quickly as possible, with no higher aspiration than the slave at his task, it behoves architects to use their influence to help, to encourage, and to point the path by every means in their power. And before they can truly help, they must themselves know. How many of us knows his brick, his stone, his iron, his plaster, his glass, his woods, &c., in the same intimate sense that Palissy, or Wedgwood, or Robbia, knew his pottery; Cellini his brass, silver, or gold; Carpaccio his paints; or Matsys his iron? Few indeed. We see on all hands designs failing in perfection at some point or other, from want of full knowledge of the proper use and capabilities of the material. The usual examples of this ignorance were, I am happy to think, more common a few years ago than now (for I am dwelling on no new subject), such as stone moulded and jointed as though it were joiners' work; wrought iron designed as though for casting; cast iron or bronze designed oblivious of the mysteries of the founders' trade; brickwork, with no care about squareness or colour of brick, the laying, bonding, or jointing; joiners' work wrong in every possible way, &c. I say I am happy to think these more glaring defects are less common. They are still seldom entirely absent, as they ought to be, from modern work. Indeed, the instinct which in old times caused men to use materials truthfully seems not only to have died a natural death, but to have largely been replaced by another and singular instinct for doing things wrongly by preference. In the thousand and one small matters which go to make a fine building, this is peculiarly, universally, and painfully true.

If you will accept and act persistently upon the principle of "truth," even at first but in the treatment of material, you will be astonished to find the length to which it will ultimately carry you. If it appear to lead you astray, it can only be because you have not fully understood it. The student of English Gothic work has the advantage at starting, because he cannot have studied well any of the grand specimens of our Mediæval architecture without imbibing, perhaps in spite of himself, some sense of the elementary portion of the principle. It forms one of the finest fields in the world for such study. The principle, however, in its broad aspect, is common to the really good art of all time,—I care not whether it be called Greek or Gothic, or is produced in Italian marble or English brick. It leads the mind more and more closely to the full meaning and beauty, the expression and musical rhythm of every detail, every cornice, and moulding, and carving of the work, and, finally, in its complete mastery, forms the groundwork on which alone noble architectural works can be conceived and carried completely through.

To their intimate knowledge of stone as a building material it was owing that the workman-architect of the Middle Ages could shape the lofty vault, and build the marvellous tracery, which delights us at Amiens, Lincoln, or York. Without it, the "*Magister Lapicida*" of Cologne Cathedral, the "*Ingeniator*" of the Galilee at Durham, and the "*Premier Masson*" of Notre Dame must all alike have failed. To our ignorance of the same thing is due the incessant tinkering found necessary upon the stonework of the Houses of Parliament. Similarly, the cause is not far to seek when the church-destroying restorer pulls a stone from its resting-place of 500 years, and finds, at the end of twenty more, his brand-new stone in a far worse state. We can the less afford to be ignorant; for we have no race of Freemasons working shoulder to shoulder in mutual instruction, and able to bring the special knowledge of their craft to him who would proportion a building. In these days he must know it intimately and thoroughly himself, learning, like any other subject, from the bottom upwards. We can never design with a perfectly free hand and unerring eye; never be more than poor imitators of a bygone time; never infuse into our work real life, without this kind of knowledge.

Another reason, and likewise of the practical kind. Look at the general condition of things in the nineteenth century. The age of despots is past. Englishmen are never in the future likely to live under any worse grinding tyranny than the caucus. Workmen are no longer slaves, even though they care quite as little, or less, about their work. The days when the prelates of powerful churches, or the despots of petty kingdoms, could employ the untold labour of their serfs in carrying out the architect's dreams have gone for ever. As Mr. Ruskin has said, "For us there can be no more the throne of marble,—for us no more the vault of gold; but for us there is the loftier and lovelier privilege of bringing the power and charm of art within the reach of the humble and poor; and, as the magnificence of past ages failed by its narrowness and its pride, ours may prevail and continue by its universality and its lowliness." Here and there an exceptional building falls to the share of an architect,—as a Parliament House at Westminster, a cathedral at Truro, or Law Courts in the Strand. But, as a rule, we must be content to do simple things, and to do those simple things as well as in us lies. Buildings of unlimited cost are now out of the question. Every one who wishes to build wishes also to build with due economy. Be it our aim to help him to build with art also. The time of the workman now means,—to put it in one word,—money. We have to produce buildings simple and good. And the importance to the architect, who would succeed, of knowing precisely how and where to place rightly every shilling of expenditure on his building, whether of moulding or ornament, sculpture or painting, has increased of late a hundredfold.

I am well aware that all this is rank heresy. I shall be told that I am endeavouring to reduce architecture from its lofty position as one of the fine arts down to the level of mere building or of ornamented construction. Not so; not so. Architecture comes after. Get your dictionary definitions out of your heads as fast as possible. You cannot write poetry, or even respectable prose, till you have absolutely and completely mastered your spelling, your verbs, and your syntax. And if you would attain to the greatest mastery, you must also know your Greek and Latin derivatives. Architecture has its grammar, its common verbs, its tiresome syntax, and its derivatives. You must know the several trades involved in building; recognise how one works with and fits into another; harmonise the several parts, like Beethoven chords, and work like scholars knowing the past history of their art, and having distinct aims for its future,—I say you must learn all these, if you would speak the language fluently or perchance write sonnets in it.

Unlike the painter, who places his creations at once upon the canvas, or the sculptor, who petrifies his ideas direct into the marble, the architect has to produce his ideas first on paper, and then to influence his obstinate materials by the hands of others. We cannot send houses and churches to the Royal Academy; and the architectural room there would be a more direct exhibition of architecture if it consisted of photographs of executed buildings. Drawings of the best actual works are constantly rejected, because not drawn or coloured as pictures. The rage for competitions encourages further the habit of showy and deceitful draughtsmanship rather than the serious pursuit of art. Under the presidency of Sir Frederick Leighton, sculpture has made great progress. Never before has there been so good an exhibition as that of last year. We may look hopefully to some similar improvement in architecture.

I fear I have said so much about the prosaic concrete and substratum of my subject as to try your patience. I must pass over the treatment of artistic truth in buildings entirely. That branch of the subject is tempting, but would lead me too far afield. The lower suits me better, to-night, and leads on sufficiently to what I have further to say. A diligent study and constant practice of truth will be found to influence your work so as to give it individuality. Having once mastered your materials in the close, intimate sense which I have urged, methods both of treatment and of construction which before seemed well-nigh impossible will grow easier. Brick and stone, iron and granite, become supple to your hand. Your study of historical architecture will acquire a further meaning. The higher thoughts of art in architecture will by degrees be spelled out. Your own standard will grow loftier and yet more lofty, till at length you may become incapable of doing or suffering ignoble or foolish buildings.*

THE FIRE AT HAMPTON COURT PALACE.

THE inquest touching the death of the servant who lost her life through the fire at Hampton Court Palace was held on Saturday last, when Mr. Edwin Chart, resident Clerk of the Works to her Majesty's Commissioners of Works at Hampton Court, produced a plan of those portions of the palace affected by the fire, and gave a detailed account of the damage done to the various rooms. None of the works of art in the galleries below had received any permanent injury.

Mr. Mitford, C.B., Secretary to her Majesty's Commissioners of Works and Buildings, said that about six years ago the system for extinguishing fires at the palace was entirely reorganised. A brigade was formed of fifteen persons, of whom four were resident in the Palace. There were monthly drills, and they were periodically inspected by Superintendent Palmer, one of Captain Shaw's officers. There were fifty-five hydrants on the main, which were constantly charged. In addition, there was a fire-main laid on the roof behind the parapet, which would enable the firemen to deluge the whole of the roofs with water, and to the existence of this main he attributed the prompt extinguishing of the recent fire. There was a steam fire-engine of 30-horse power, capable of pumping about 700 gallons of water per minute, and of throwing six large jets to the highest part of the palace. Besides, there were two manual engines and a fire curricle, three hand-pumps, a hose truck, seventy-five fire-buckets, and a fire-escape of Capt. Shaw's pattern. In the picture galleries were fourteen internal hydrants and twenty external hydrants. Six new corridor engines and two hand-pumps full of water were kept in the landings. Printed instructions, with full information for

* To be continued.

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all persons about the palace, were hung in prominent positions near the hydrants. With regard to the suggestion of placing a tank on some part of the palace, it appeared to him that the main laid along the roof really gave greater security, for with the powerful engine to charge it, there was practically the supply of the Thames. He could not suggest any additional measures that would be an improvement on those already provided for dealing with fires.

Having heard evidence as to the cause of the fire, the jury returned the following verdict:—

"The jury are of opinion that the deceased me her death by being suffocated by the smoke and gases arising from a fire caused by the accidental upsetting of a mineral oil heating-lamp. They wish to add that they think the speedy extinction of the flames and the prevention of extensive damage was due to the excellent apparatus for extinguishing fire at the Palace, and to the exertions of the Palace Fire Brigade, assisted by the officers and men of the 4th Hussars. And they would like to recommend that regulations should be made preventing the storage or use of mineral oils within the Palace."

Mr. Mitford revives an old suggestion by writing to say that every landing of every house in which mineral oils are used should be furnished with a scuttle or bucket of sand. Sand, if thrown upon burning oil, disintegrates it and puts out the flames, which water used in small quantities tends only to spread.

THRONDHJEM CATHEDRAL, NORWAY.

Throndhjem Cathedral, of which we give an illustration in this week's *Builder*,—as it will appear when the works of restoration, which it is now undergoing, are completed,—is an edifice the history of which is so closely interwoven with that of the city of which it forms such a prominent feature that we may be pardoned if we briefly trace the outlines of the records of the latter. The city of Throndhjem occupies a prominent position in the present day among the towns of Norway. It is the third city, as regards population, in the kingdom, and, as the coronation town of the kings of Norway and the site of the Bank of Norway, of great importance to the country. It ranks even higher in the history of the Norwegians, for, independently of possessing a magnificent cathedral, it was the residence of the old kings and archbishops of Norway, and the scene of many remarkable events. The name of the town was orginally "Nidaros," Throndhjem being the name of the "fylker," or shires, bordering on the arm of the sea which is now known as Throndhjem Fjord; the present name of the city dating from the fifteenth century. Nidares was founded by Olaf Tryggvesön, who, in 996, after vanquishing the mighty Jarl Haco, of Hlade, the ruler of Throndhjem, built a royal castle and a church, dedicated to St. Clement, here. Those buildings soon fell into ruins; they were, however, restored by Olaf Haraldsön, surnamed the Pious, between 1016 and 1028. Olaf Haraldsön died for his faith in the battle of Stiklestad; but his death was destined to become an ultimate victory to the cause he fought for. He was buried in the sand on the banks of the Nidelo, and on his body being afterwards exhumed, it was found to be in a remarkable state of preservation. As it was asserted that hair and nails had grown after death, he was declared a martyr. The probable cause may, perhaps, have been the character of the soil. Olaf was afterwards canonised by the Pope as the patron saint of the North. The shrine containing the body was placed on the altar in the Church of St. Clement, and miracles, it is reported, then became frequent.

After several changes from one church to another, the shrine was at last deposited in the first cathedral of Norway, that of Nidaros, which was built by Olaf Kyrre on the original site of the grave of the saint. This was the beginning of the "Domkirke," or cathedral, of Throndjem, which was consecrated about 1093, and received the name of "Kristkirke" (Christ Church). The shrine with the body of the saint was placed on the altar erected on the exact spot where it had previously lain. This church has, through many architectural changes, blossomed into the present cathedral.

The original church was simply a nave 150 ft. long and 40 ft. wide, with a semicircular choir. For sixty years the church was left thus, and three kings were buried there. In 1151, the first archbishopric was established in Norway, and Nidaros made the cathedral city, its church possessing the national relic. It was now decided to improve and enlarge that church and make it worthy of this honour; but it was not until 1161 that the work was taken in hand by Archbishop Egstein Erlandssön, who added a transept below the great tower, and also the chapter-house. Another king was buried in the cathedral, and the bodies of two others removed there; but since then no more sovereigns have been entombed there. In the year 1200 a fresh period of reconstruction and building commenced, which lasted until 1240. During that time the whole eastern part was reconstructed, and the dome elevated and covered in with slates. From this period, also, dates the Early English apse. It is surmised (for there are no records to guide us) that this addition was the work of English architects, sent by the then Bishop of Winchester, the cathedral of which the Norwegian edifice is said in parts to resemble. The last and final period of construction began in 1248, building operations continuing till the close of the century, during which the western wing was added, and the steeple probably raised. By the end of that century, the edifice stood in its most complete form. The large sums required for completing the great work, as well as the considerable funds the cathedral possessed, were contributed by pilgrims who came from all parts of the then Christian world, even from the Holy Land, to offer their prayers and obtain absolution at the shrine of St. Olaf.

The cathedral of Nidaros was the largest and most magnificent ecclesiastical building in the three Northern kingdoms. Its length from east to west was 325 ft., and its western front, imposing by its images of saints, finely carved in stone, and its rich ornamentation in gold, was 124 ft. long. A lofty tower and spire rose from the centre, and a number of smaller ones from several parts of the building. The interior was largely ornamented with beautiful columns and pilasters of sandstone and marble of various hues, detached, engaged, and clustered. The windows were of stained glass. The nave was in three stories of different heights, two galleries running completely round the church. There were twenty-four altars richly adorned with precious stones. Shrines of saints,—St. Bernhard, St. Eystein, and St. Olaf, the patron saint,—were raised above three of them. The shrine of the last-named saint was placed on the principal altar, the body resting in a silver chest weighing 220 lb., which was enclosed in two cases of choice wood, the outer one being curiously carved in the same manner as the old wooden churches of Norway, and covered with gold and silver.

The cathedral did not remain long in this magnificent state. Fires destroyed one part after another, the last taking place in 1531, when the western end became the heap of ruins it is to-day. The union with Denmark, which destroyed all vitality in the Norwegian people, blunted also the interest in the preservation of the cathedral. The Reformation played further havoc with the interior. The altars with their ornaments were removed, and with them the shrines of the two minor saints. They went to fill the pockets of some Danish potentate. At last the silver chest with the valuable exterior case went also to Copenhagen, all trace of them being lost; the body of St. Olaf alone remaining in its plain coffin. During the Northern Seven Years' War it was carried to Stockholm, but again brought back to the cathedral in 1568. The coffin was now concealed in the church, and has not been found, in spite of the most careful search. Its discovery would be of great interest. Popular tradition has it that the coffin was also to be forwarded to Copenhagen, to rob the king saint of his valuable shroud, but the vessel which was to bear it thither foundered in Throndhjem Fjord with its treasure. Thus, tradition says quaintly, the saint refused to leave the soil whence he had sprung.

By the terms of the Norwegian Constitution of 1814, the kings of Norway must be crowned in Throndhjem Cathedral. Four coronations had taken place before that time,—those of Haco V., the last male descendant of Harald the Fairhaired and the Norse kings; the Swedish protector, Karl Knutssön; and Christian I. and Hans, two Danish kings. Since 1814, three more coronations have been held at Throndhjem, those of Carl XIV., Johan Carl XV., and Oscar II., Oscar I. never being crowned as king of Norway.

With the revival of Norwegian national feeling during the last sixty years of constitutional and personal liberty, a strong desire sprang up amongst all classes to save from utter destruction the few architectural remains bearing witness to former greatness, and naturally the first to be taken in hand was the old cathedral of Throndhjem. It was found to be in a most shocking state of ruin. Time and fire, of course, had done much; but at the hand of man the noble structure had fared worse. It was, for instance, discovered that at one time or another the walls with their beautiful stone carving,—maybe to hide from view defects or idolatrous images,—had been coated with several inches of plaster. The principal work of restoration consists now in removing this covering, and laying bare the original surface without injuring the carving, a most laborious task, requiring much care in its progress. Of other improvements contemplated, we may mention the raising of a lofty steeple on the present stunted walls of the old tower, now merely covered by a gable roof, and eventually the rebuilding of the ruined western portion of the cathedral,—a work which will not be completed for some years.

Of interest in the cathedral is a sacred well on the southern side of the choir, called "St. Olafs Brönd," said to have sprung from the grave of that saint, and in which visitors are wont to drop coins, which resound at the bottom as if the latter were of metal. Another remarkable feature in the church is the obliquity in the foundations of the eastern portion of the cathedral. The great altar has been left untouched during the various restorations, from regard for the traditions attaching to the spot. The church contains figures of the twelve apostles by the famous Danish sculptor Thorwaldsen. Divine service is now again performed in the cathedral. The latter has been the scene of many historical events in the Norse age, and in it have been laid many of the best scenes of the dramas of Henrik Ibsen, Norway's Shakspeare.

The architecture of the first church was Norman, or, more correctly, Norse, the architecture which the Norsemen cultivated in Normandy. The later additions, particularly that made towards the end of the thirteenth century, are Early English.

The work of restoration has now been in progress for nearly twenty years; at times, however, ceasing from want of funds. Some of these have been contributed by the people, but the largest sums have been given by the present king, Oscar II. It is worthy of notice that no funds can be spared by the Norwegian Storthing for the restoration of the finest monument extant of the former greatness of the nation.

The present architect directing the works of restoration is Mr. Christie. A Royal Commission has just been appointed, consisting of the best architects of Norway, to report on and draw up further plans for the work.

SWIMMING BATH: UPPINGHAM SCHOOL.

This swimming-bath has been built this summer, at a total cost of about 1,350*l*. The plan is arranged to meet the special requirements of a public school, as it is proposed to add fives-courts at the back. The buttresses have been regulated by the Eton sizes. Lawn tennis courts are now being laid down in front of the building.

Local materials as far as possible have been used. The rubble walling is of Old Uppingham stone. The dressed stone used is the Casterton grit, and the roofs are covered with plain red tiles from Lord Aveland's yard at Luffenham.

Concrete has been used for the bath itself, composed of Barrow lime and the local hard blue rock, faced with Portland cement mixed with an equal quantity of Derbyshire spar. The colour of the cement has proved satisfactory.

The heating apparatus, by Messrs. Herring, of Chertsey, answers well, and utilises the exhaust steam from the waterworks engines; arrangements also being made to supplement this supply by green steam from the boilers direct when necessary. The condenser contains about 600 ft. of pipe, and the disposition of the flow and return pipes to the heating chamber distributes the heat well over the whole bath.

Mr. John Woolston, of Stamford, has carried out the building in a satisfactory manner, Mr. John Brown acting as clerk of the works.

The architect is Mr. Arthur Young, of 19, Queen Anne's Gate.

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THRONDHJEM CATHEDRAL, NORWAY, AS RESTORED.

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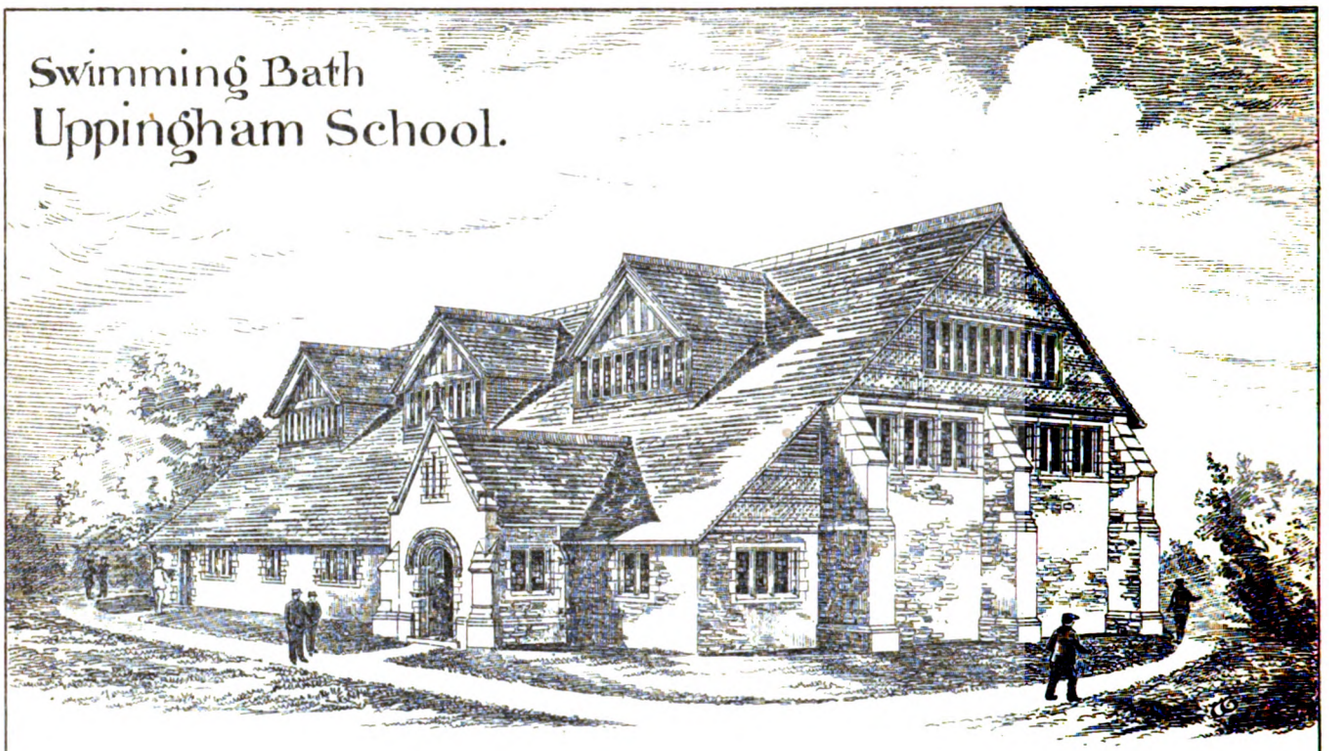
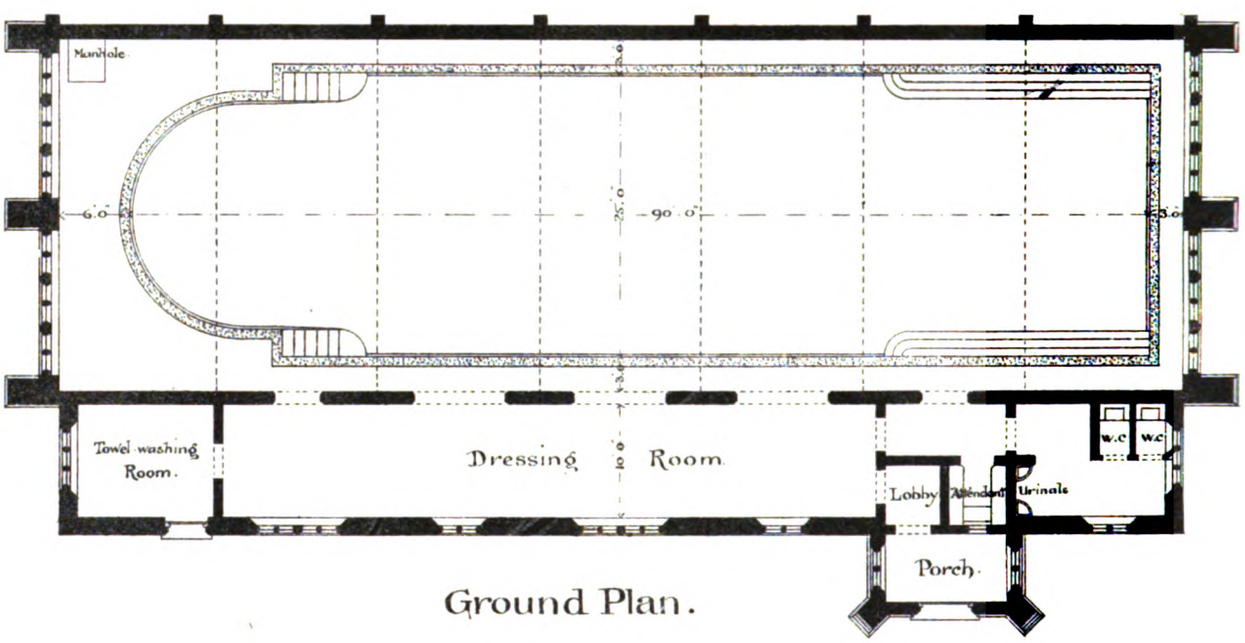
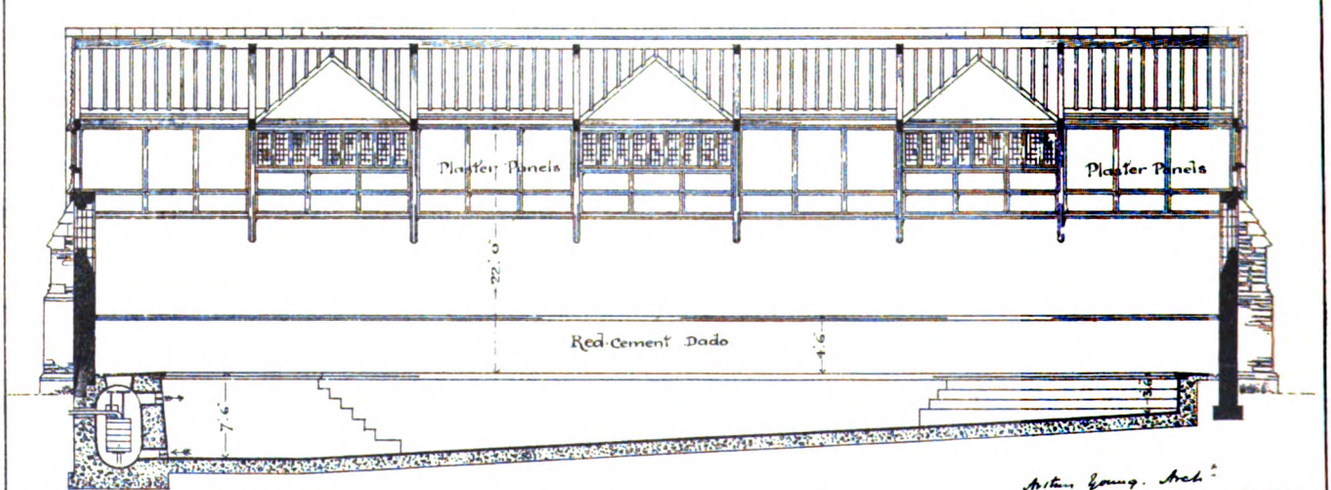
Swimming Bath Uppingham School.





Ground Plan.



Longitudinal Section.

Arthur Young. Arch.t
19. Queen Anne's Gate.
S. W.

10 5 0 10 20 30 40 50
Scale of Feet.

Thos: Garratt_delt. Nov.r 82.

Whiteman & Bass, Photo-Litho 236 High Holborn.
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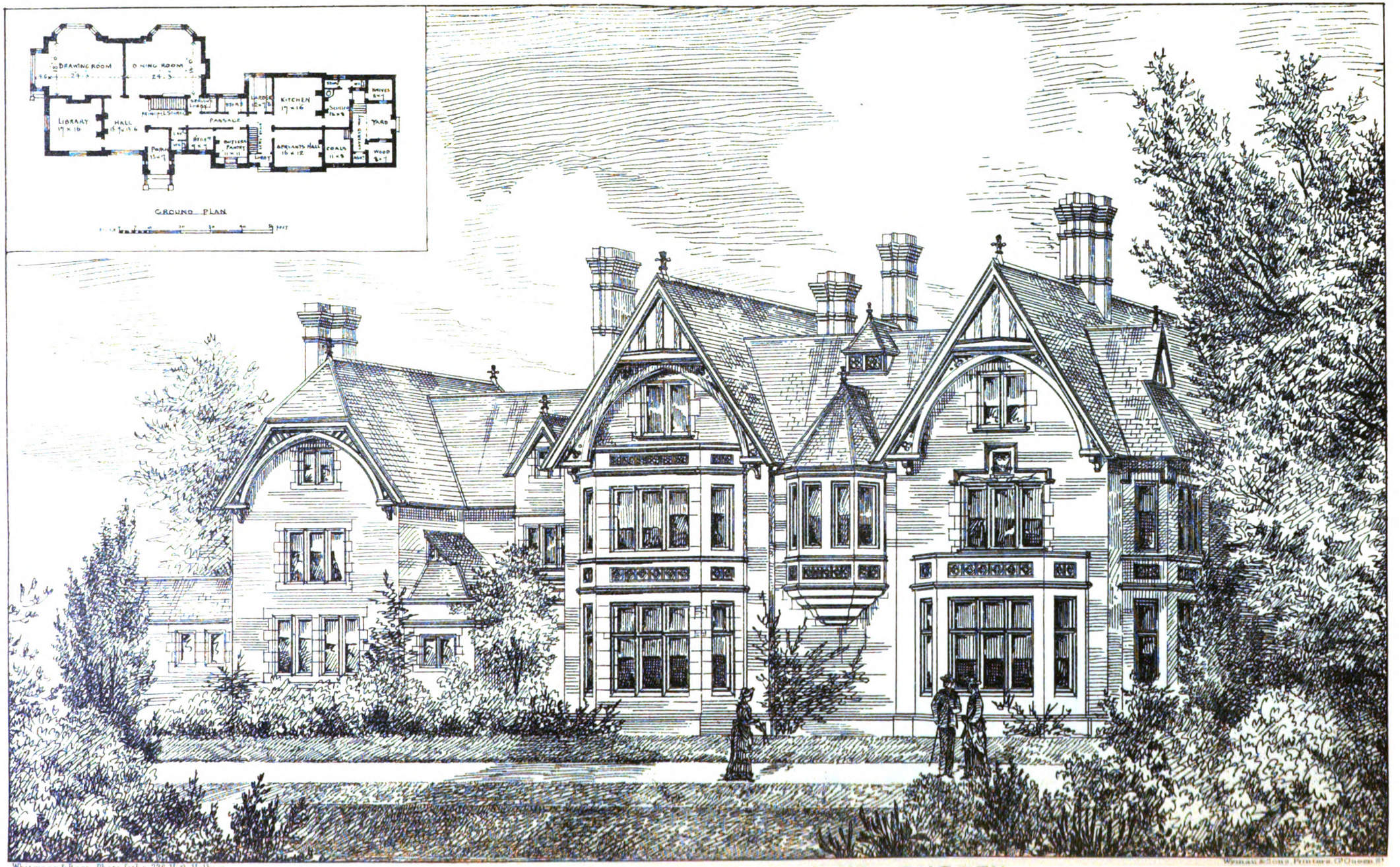

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RESIDENCE GOFFS HILL CRAWLEY SUSSEX.

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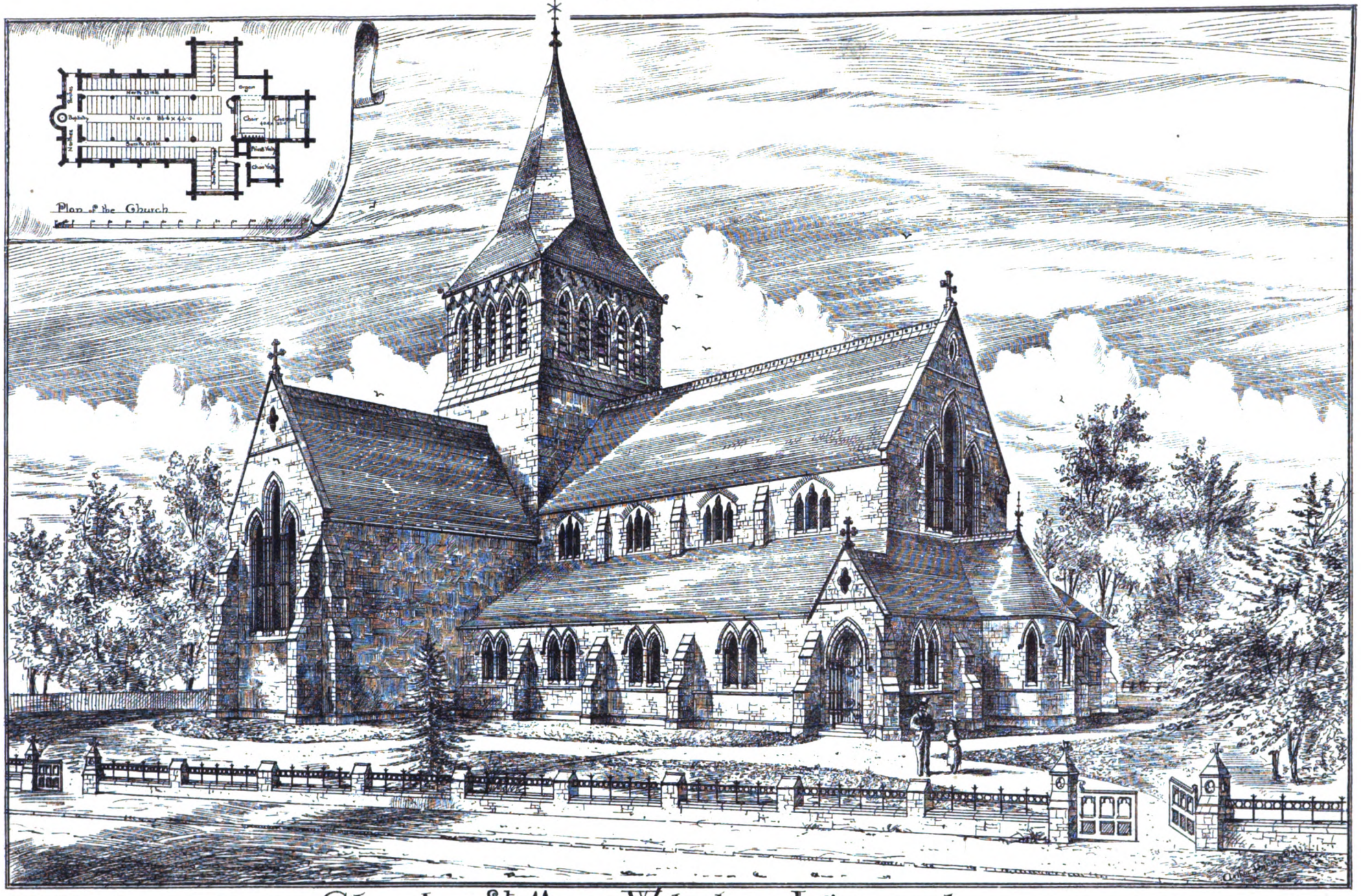

Church of St. Mary, Waterloo, Liverpool.

The Revd. Henry Burrowes ... Vicar.
Chas. R. Williams, Esqre
Wm. Toulmey, Esqre ... Churchwardens.

W. G. Habershon & Fawckner, Architects
38 Bloomsbury Square, London.
August, 1882.

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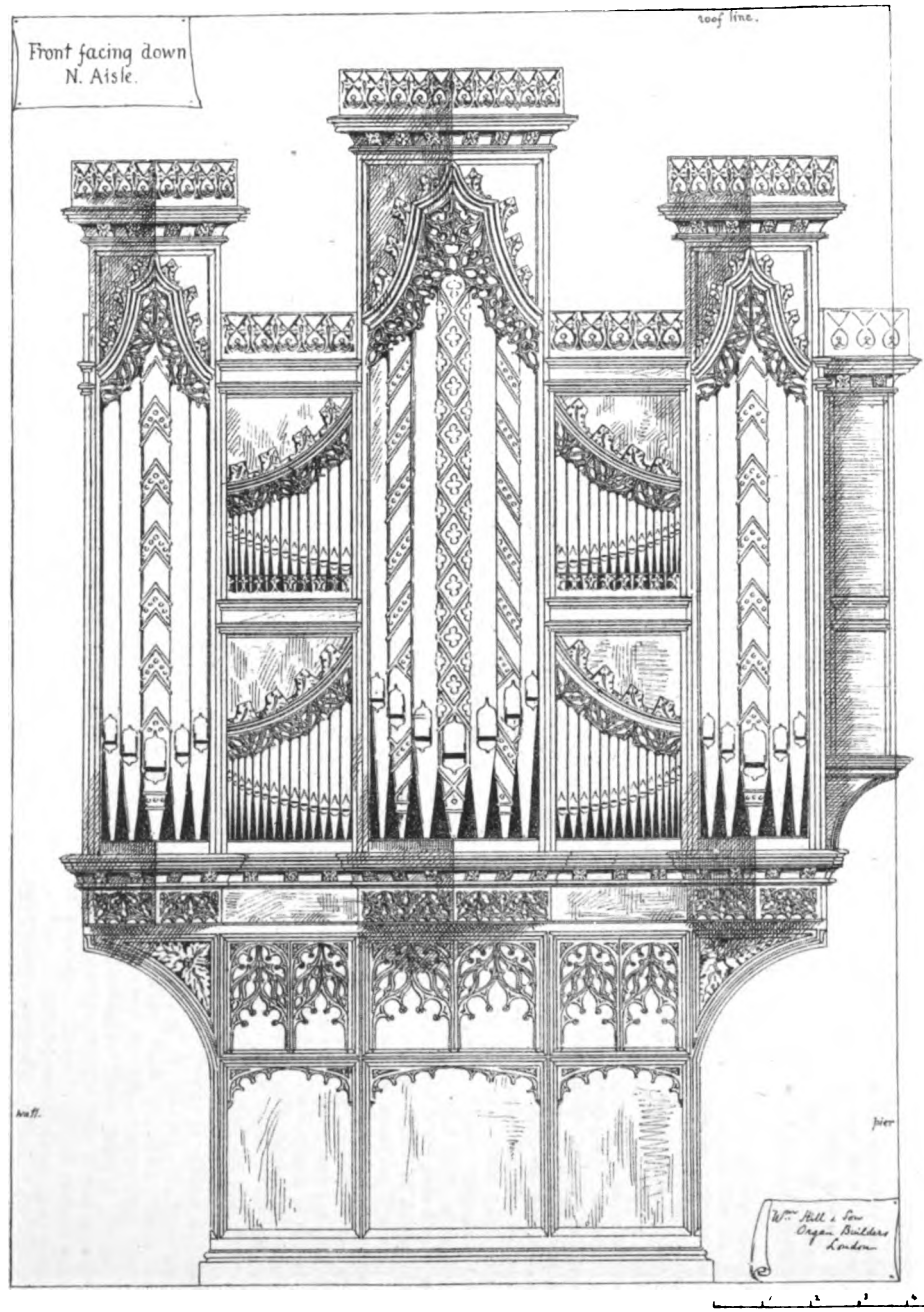
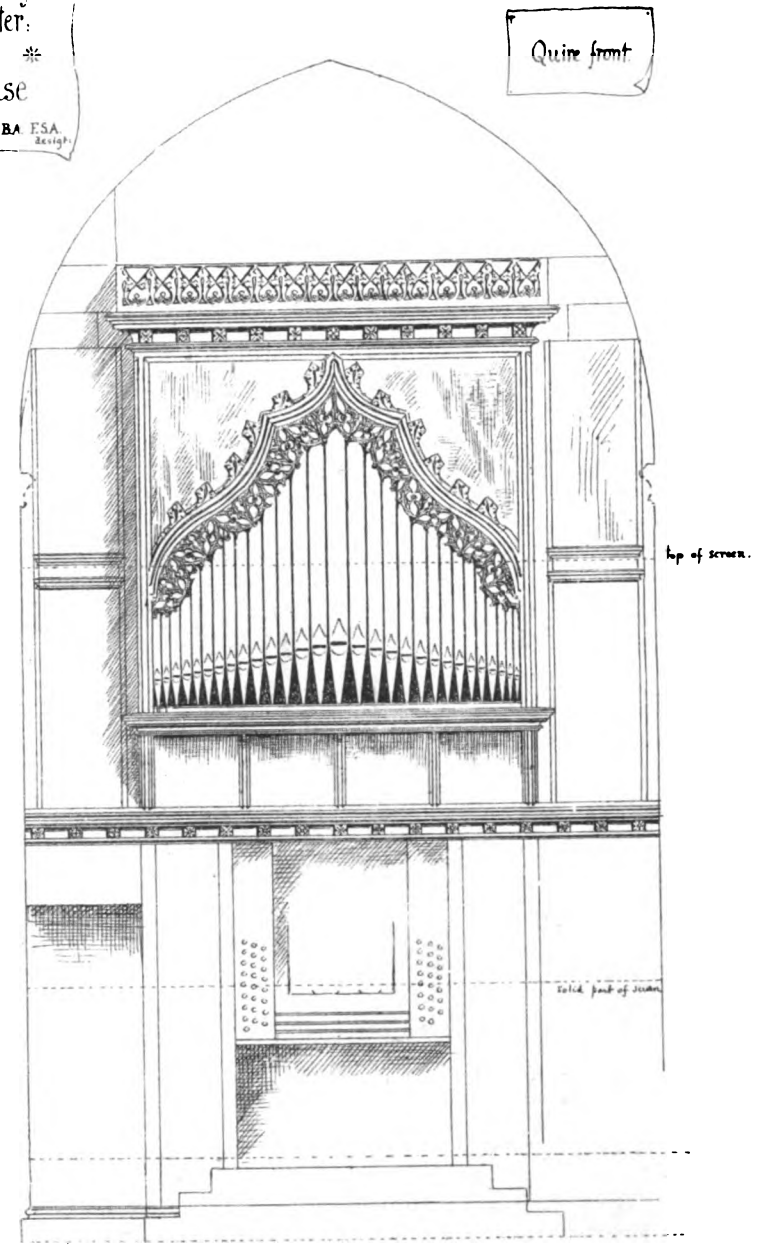
Church of S. Margaret Westminster: new Organ-Case

Arthur G. Hill BA FSA. design.





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ST. MARY'S, WATERLOO, LIVERPOOL.

THIS church is in course of erection in Waterloo Park, one of the new and rising suburbs of Liverpool. It is in the form of a Latin cross, with a low tower and shingle spire rising at the intersection. It is constructed of the reddish-brown local stone from Bootle, in random courses, and the freestone dressings are of Corn-grit from Bath. The interior is lined with dark crimson bricks with red bands interspersed with stone, and all the piers, arches, and mouldings are of Corsham stone. The woodwork is entirely of pitch-pine, and of massive character, with open-boarded roof, lined with felt. It will seat about 800 persons, and the total cost, including tower, will be 3,000*l*. Messrs. Habershon & Fawckner are the architects.

RESIDENCE, GOFF'S HILL, CRAWLEY.

THE residence here illustrated, recently erected at Goff's Hill, Crawley, for Mr. Edwin Henty, from the designs and under the superintendence of Mr. William Buck, architect, Horsham, stands on an elevated site, and commands exceedingly fine views of the picturesque town of Crawley and the surrounding country, extending as far as the Surrey hills. It is approached from the main road on the south, and contains an entrance-porch, hall, three reception-rooms, and the usual offices on the ground-floor, six bedrooms and two dressing-rooms on the first floor, and six rooms on the second floor. It is faced with red kiln bricks with Bath stone dressings, and the roof is covered with red local tiles. The contract for the house has been satisfactorily carried out by Messrs. Peter & Redford, builders, of Horsham, whose tender was 3,750*l*., Mr. Tanner was the clerk of the works.

ORGAN-CASE FOR ST. MARGARET'S, WESTMINSTER.

THE organ in the above church is being completely rebuilt and enlarged by Messrs. W. Hill & Son, and when the work is finished the instrument will be one of the finest in London. The church, having been greatly improved and refitted of late years, from the designs of the late Sir Gilbert Scott, is now an extremely fine one, and it was thought advisable that the organ should be enclosed in a case of sufficient architectural importance to be worthy of the church.

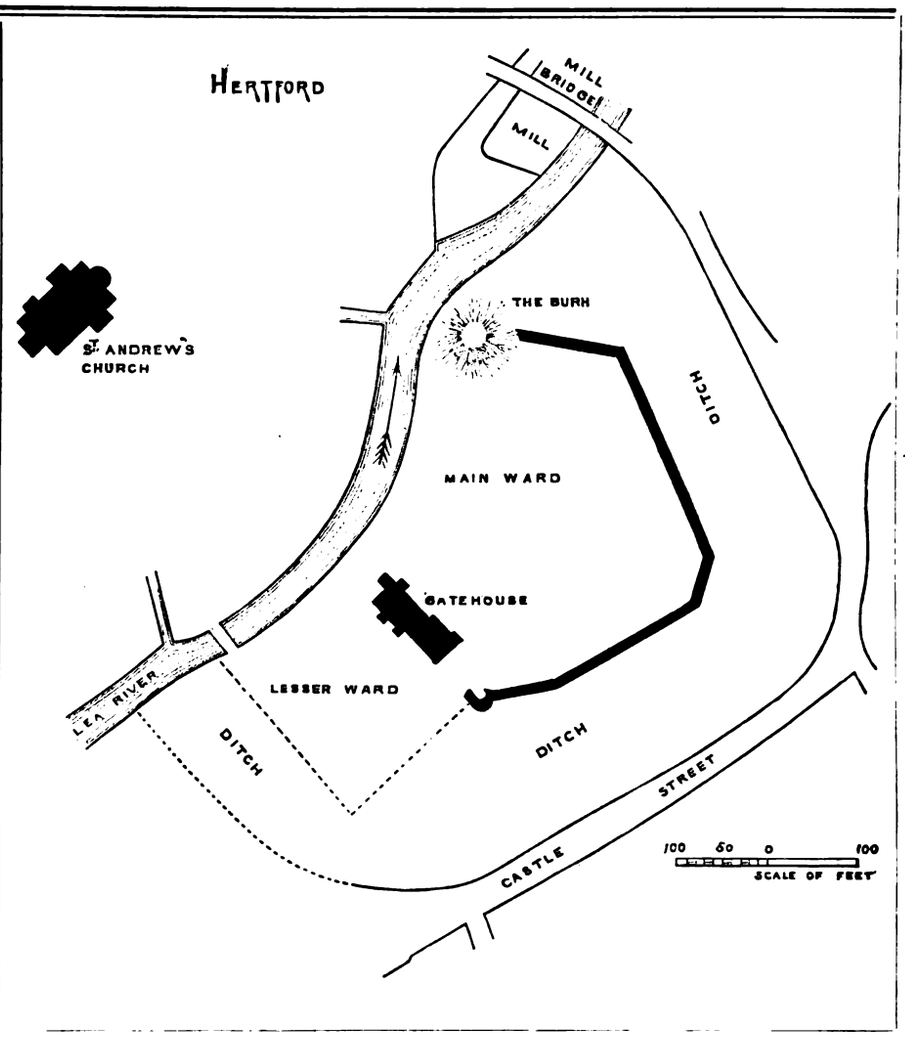
The selected design, of which we give a reproduction, was prepared by Mr. Arthur G. Hill, B.A., F.S.A., and will be executed in oak. The details of the work are in accordance with the ancient examples that can still be seen at Tirlemont in Belgium, and elsewhere.

The organ will stand at the western extremity of the north aisle, and there will be one front facing west and another looking through an arch into the choir.

HERTFORD CASTLE.

THE Castle of Hertford not only is of high antiquity, but the date of its foundation is on record. The Saxon Chronicle relates that in the year 913, Edward the Elder, son of Alfred, threw up two Burhs at Hertford, one at Martinmas, on the north bank of the river, and, later on, one on the south bank, between three of the rivers which here unite. The former of these works has long been laid low, and no trace of it is visible, but the latter has been preserved by its incorporation into the later castle. The mound, standing on the edge of the river Lea, is indeed shorn of its original dimensions, but it remains, and attached to it is the base court with its exterior ditch, once of great breadth and depth, the invariable accompaniment of the mound, and with it constituting the Burh.

Edward's Burhs may have been preceded by an earlier earthwork, for Hertford is reputed to stand on the site of a chief town of the Trinobantes, the British occupants of the district north of this part of the Thames. The Britons, however, if they here established a stronghold, are more likely to have placed it upon one of the adjacent heights, where are several excellent positions for an entrenchment. Probably the existence of a British settlement in a neighbourhood so well protected by its water-courses attracted the invading settlers, for here the East Saxon kings are said to have had a residence, and to this place Archbishop Theodore, consecrated in 668, convened a synod of the National Church in 673.



The Danes overran this part of England more than once, and the camp at Danesbury was probably their work. Also, they are thought to have had a camp upon Port-hill, of which, however, it is said that no traces are now to be seen. It was upon the river Lea, between Hertford and Waltham, that Alfred rendered the Danish fleet useless by blocking up the river, and so preventing their return. It is, however, on record that this was effected, not by actually throwing a dam across the stream, but by the far more scientific process of cutting a number of channels for its waters, each too shallow to allow the vessels to float down. By this means the retreat of the Danes to the Thames was cut off, and they were fain to march inland to the Severn at Bridgnorth.

In 913 the protection afforded by the Hertford Burhs seems to have attracted inhabitants, who occupied both banks of the river Lea, and the town thus situate was raised by Edward into a royal Burgh, held of the Crown by Burgage tenure. Hertford was so held of the Confessor, and so accepted by the Conqueror, and entered in Domesday, which, however, as was not uncommon, makes no mention of the castle, nor, indeed, of the churches. William is said to have strengthened the castle, and he gave it in charge to Peter de Valoignes, one of his followers, who transmitted it to his son Roger, and he to his two sons in succession, Peter and Robert. The male line closed with Robert, whose daughter and heiress, Gunnora de Valoignes, married Robert FitzWalter. The charge of the castle does not seem to have descended, but to have been resumed, possibly as a male fief, by the Crown.

King John, that most erratic of monarchs, held the castle, and visited it in 1212, 1213, and 1216. In this latter year, however, it was attacked by Lewis of France, who laid siege to it from St. Martin's (Nov. 11) to St. Nicholas Day (Dec. 6), and finally took it. Robert Fitz Walter, an adherent of Lewis, took the opportunity to revive his wife's claim, but without success. It was finally recovered by John, and transmitted to his son Henry III., who placed Richard de Argentin in charge of it, and expended 20*l*., and probably other sums, in its repairs. It 1226 it was held by Hubert de Burgh, on whose fall Henry granted it to be held "*in capite*" by Wm. de Valence, after whom it was held by his son Aymer, Earl of Pembroke.

Edward III. resumed possession in 1327, and granted the castle to John of Gaunt, his son, from whom it finally passed into the Duchy of Lancaster, to which it is nominally attached. Henry VI. kept his Easter here in 1429, and Henry VII. continued to appoint a constable and a porter. It is described as "*castrum non immensum sed pulcherrimum.*" Hertford fared better than most royal castles, possibly from its convenient position as regarded London, for in the reign of Henry VIII. it contained lodgings suitable for the king, and Edward VI. and the Princess Elizabeth were both here. By the latter, when queen, it was alienated to Sir William Harrington, who built a large brick house on the site of the inner gate-house, which still remains. In the time of James I. the castle is described as covering 7¾ acres. The ditch then extended to the roads or streets now known as the Mill Bridge, the Wash, and Castle-street. The mill was upon the Lea just below the castle mounds. The Church of St. Andrew stands about 150 yards from the remaining mound, beyond the river. There was a second mill, probably that on the river above the castle. The castle was finally acquired by Mr. Secretary Cecil, in whose descendant, the Marquis of Salisbury, it remains. It is remarkable that Hertford Castle at no time belonged to the earls who bore the title of Hertford. They were, of course, earls of the county, though this is not specified in the peerages. Their principal eastern seat was at Clare in Suffolk, round which they possessed considerable property.

The strength of Hertford as a military position was very great, and depended upon the low marshy ground by which it was almost surrounded, and which was liable to be flooded by the waters of three, or rather four, considerable streams, "*flumina non profunda sed clarissima.*" Of these, the Lea, flowing from the west, received, a few yards above the castle, the Mimram from the north-west, while a little

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below the castle the combined stream is swollen by the waters of the Beane from the north, and the Rib from the north-east, the combined volume flowing forward under the name of the Lea. Below, or south-west of the castle, along the course of the Lea, is a wide breadth of low-land, which even now is occasionally flooded, and which in former days must have been an impracticable morass. In the other direction the ground, though built upon and forming a part of the town, is for some distance around but little higher than the meadow, though here and there, elevated 4 ft. or 5 ft., appear small deposits of gravel. The castle stands upon the right bank, south-east of the river, and its extreme limit, within the counterscarp or outer edge of its main ditch, included a space of about seven acres and a half, something in the figure of an ear, the river forming the shorter side or concavity. In length, north-east and south-west, this space measures 234 yards; its breadth varies from 100 yards to 200 yards, with a mean of 140 yards. The ditch, now almost filled up and in part built over, was about 30 yards broad, and no doubt filled from the river with which it communicated at each end. Within the ditch, taking the line of the old bank or of the present wall, the area is about three and a half or four acres. The mound is placed on the edge of the river, at the north angle of the enclosure. The bank does not include it, but points to its centre, so that the mound, as was not unusual, forms a part of the enclosing defence. The proper ditch of the mound has been filled up.

Of the Mediæval castle there remains only a considerable part of the wall of the *enceinte*, and, it may be, some ancient masonry built up into Sir William Harrington's house, which is still inhabited. This is said to have been the gate-house; if so, it was that of the northern ward, and was upon the line of the wall dividing the one ward from the other. The curtain wall is about 7 ft. thick, and 25 ft. to 30 ft. high, and composed of flint rubble. The battlement is gone or nearly so, and there remains but a part of one mural tower, circular in plan, which capped the south-east angle of the wall of the northern ward. The wall covers the northern and most of the eastern sides of the area. There is no trace of it along the western or river side. No doubt it was less substantial on that side, upon which the natural defence was strong. The south or smaller ward does not appear to have been walled in. It was covered on the three sides by the river and the marsh, and may have been palisaded only. The wall evidently crossed the ditch of the mound, and abutted upon it, or possibly upon the shell keep, all vestiges of which are gone.

The present entrance to the castle is at the eastern angle of the ditch, which is traversed by a road leading to a small and apparently modern doorway in the wall. There is no trace of a main entrance in this direction, but it must be confessed that if the main entrance lay to the south of the gatehouse, it must have been difficult to approach, save by water.

G. T. C.

FIRES AT COUNTRY MANSIONS AND SOME SUGGESTIONS FOR THEIR PREVENTION.*

The announcement that a country mansion has been totally or partially destroyed by fire has come to be recognised as one of those inevitable contingencies that are bound to occur at intervals comparatively of short duration. A fire, no matter where, is a disastrous occurrence at any time, although there may be occasionally some consolation in the fact that it paves the way for much-needed improvements. The Great Fire of London was considered at the period of its occurrence an almost unparalleled calamity, but we have no doubt now, that it was, on sanitary grounds alone, productive of the greatest possible good. But the destruction of some rare specimen of ancient domestic architecture, containing, perhaps, an invaluable collection of art-treasures, and itself rich in historical associations, has no redeeming feature, and when such a calamity occurs on a large scale, we cannot but feel that a national loss has been sustained.

Although there is no doubt that the destruction of many old country mansions is the result of carelessness, or at any rate might have been avoided with the exercise of some care and forethought, yet the greater portion have, I think, come to an untimely end from causes which it was very difficult practically to provide against. I am led up to this remark by a paragraph in *Baily's Magazine* for November anent the loss by fire of Everleigh House, in Wiltshire, in which, with the best of intentions, it is suggested with the view of preventing conflagrations, to have every fire-place, flue, and hearth examined and all timbers too near the fire removed. If a mansion is undergoing thorough reparation, there would be, perhaps, no obstacle in the way of taking up all the hearths, removing all the grates and chimney-pieces, stripping the plastering off walls in the line of flues, and making a general search for wood beams, wood bricks, wood bond, and joint wedges; but I submit that in an inhabited house, the occupier, as a rule, would prefer the risk of a fire rather than have every room reduced to a state of chaos, and the fitments, perhaps, irreparably damaged. Nothing short of what I have described would render it certain that dangerous wood had been removed, and even then the flues themselves might be defective. I grant that no very great danger should be anticipated from the proximity of wood to the chimney-flues, between the top of the wainscoting or skirtings and the ceilings or under-side of cornice, but the element of danger exists all the same, for wood blocks have been found inserted over the fireplace for the purpose of fixing a chimney-glass or overmantel thereto, and wood blocks also for securing the bell-pulls, or bell-cranks, and I have myself seen a block of wood removed from a chimney-breast about midway between floor and ceiling, which went into a flue, and the existence of which can only be accounted for by assuming that it was placed there for one of the above purposes, or was the end of a putlog inserted at the time of building, and for some reason or other sawn off instead of being withdrawn.

The destruction of old country mansions may be traced usually to one or another of the following causes:—First, lightning; secondly, constructional defects,—that is, those which originate from improper construction, and which can only be ameliorated, viz., defective flues, fireplaces, and hearths (so called, but more truthfully bad carpentry in fixing wood contiguous to or into chimney-stacks and fireplaces), timber-beams under hearths, or wood-bearers for supporting the hearths, and carelessly-arranged heating apparatus, hot-air flues, hot-water pipes, and iron-stove pipes; thirdly, spontaneous combustion; fourthly, accidents,—or, more properly speaking, carelessness of a more or less positive order, such as dropping lighted tobacco on carpets, smoking where there is straw from packing-cases and wine-bottle covers, shavings or firewood, or, in the lamp-room, overturning of oil-lamps, setting light to window-curtains reading in bed, insufficient control of lucifer-matches, carelessness with gas, leaving fires unprotected in the grates at night, carrying lighted benzoline or oil-lamps and candles where straw or shavings accumulate from the unpacking of goods, and some others that would appear to rank next only to incendiarism.

With regard to lightning, this may be considered as one of the causes of fire, the danger from which may be reduced to a minimum by the use of lightning-conductors. But these may be rendered useless if not properly constructed or fixed, or if the area to be protected is guarded by only one conductor. The general rule appears to be to place a single lightning-conductor on the top of the highest chimney, and this is assumed to be sufficient to protect the entire building, no matter how large, from the electric fluid, but the Lightning-rod Committee appointed by the learned societies to investigate the subject came to the conclusion that, although the highest point attainable was the proper one to fix a conductor, the area of protection was limited, and the line of limitation was obtainable thus:—"From the point of the conductor draw an imaginary line at an angle of 45 degrees till it reaches the ground. The latter is on the circumference of a circle of which a perpendicular dropped from the point of the conductor would be the centre." The figure, in fact, would be a cone, the conductor-point being the apex, and all the buildings standing on the base of the cone might be considered free from danger; of course there would be as many conductors needed as the magnitude of the buildings required. Where there are lightning-rods it is essential that all underground gas-pipes, water-pipes, or metals of any description are kept a respectful distance from the ends of the rods which are buried in the ground, or the electric fluid, instead of passing harmlessly away in the great storehouse of electricity, the earth, may get transmitted where least expected. With regard to defective hearths, fireplaces, and flues, it is estimated that about three-fourths of the conflagrations in town and country arise from these causes. But the description of the cause of such fires is varied; sometimes we read of overheated flues or defective flues; or, as at Ingestre Hall, from timber beneath the hearth-stone. Practically, the fault is not that of the flues themselves, but of the careless manner in which timber is brought into almost direct communication with them. What is known as a "defective" flue may arise from various causes. It must be remembered that when the chimneys of old country mansions were built, climbing boys were their scavengers, and the conditions under which the soot was removed were far more favourable to that process than by the sweep's machine. Many of these flues are irregular in size, and usually much larger than the present ordinary house-flues, and the result is that the sweep's brush, being too small for the opening, only dislodges such portion of the soot as it happens to come in contact with, and another disadvantage is that the sweep's brush is round, while the flues are square, so that the corners or angles of the flues seldom get thoroughly cleaned out. Still other disadvantages arise from the fact that these old flues, while they often travel for some distance in a perpendicular direction, suddenly go nearly flat, and form what the sweeps call "dead slants," and as the elastic rods of the machine can only bed to a certain curve, the angles of these "dead slants" remain unswept, and, in addition, afford receptacles for an accumulation of soot, which, becoming heated, takes fire and smoulders for a considerable time. Occasionally there are in some chimneys what appear to be recesses made at the sides of the flues, probably as resting-places for the climbing boys, and these recesses and the "dead slants" are the points of danger, as the brickwork becomes hot, while the parging of the flue having probably been scraped away by the periodical application of the sweeping-machine, the mortar-joints of the brickwork get, in course of time, partially disintegrated. As an instance of the danger from these places, I remember some years ago a case where a strong smell of smouldering wood pervaded a bedroom of a mansion. After searching some considerable time without success for the origin of this smell, smoke was seen to come up between the joints of the flooring, and on tearing up the boards the mortar-joints of the bricks between the floor and ceiling were found to have disappeared. On cutting a hole in the brickwork, a large quantity of soot in a burning state was found in a flue of which these loose bricks formed a portion of the side wall. Of course the inevitable shavings were discovered below the floor-boards adjoining the flue, and these were in a charred condition, and evidently on the point of bursting into a flame. Now, had a general search been made for wood, no one would have thought of looking below the skirting-board for danger, especially as this flue appeared to pass in quite another direction. Another source of danger in old mansions is the existence of bond timber in walls; this is practically unknown now in new buildings, but the builders of old were apparently profuse in their use of wood bond, and, unfortunately, they often, with the view of rendering it efficient, built it in the middle of the walls; and I have found, during some alterations, bond in the centre of a wall within a few inches of a chimney flue and blackened from heat. No search could possibly have detected the existence of this element of danger. Cliveden mansion, near Maidenhead, was destroyed by fire in 1849, attributed to wood bond-timbers running into a flue. Chimney beams consisting of oak timbers 9 in. or 12 in. square were usually employed, instead of what we know now as the "chimney-bar." I can find no record as to when chimney-bars were first used, but wood beams are known to exist in houses less than 150 years old. All chimney-beams that I have come across appear to have been fixed about 5 ft. from the floor; and in many old mansions, I have no doubt, these beams still exist, a chimney-bar having been

* From a paper by Mr. Thomas Potter, read at the meeting of the Clerks of Works Association on the 4th instant.

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subsequently employed without removing the beam, and a course of bricks built in between the bar and the beam, which would give about the right height for a modern grate. Now, when this beam is plastered on the outside and hidden from view, and a grate is, perhaps, badly fixed, leaving flat ledgments for soot to accumulate on the inside, we may guess the amount of risk incurred. Loughton Hall, burned many years ago, is an example of a mansion burned through the chimney-beam taking fire. An instance of the difficulty of being able, no matter how careful a search is made, to find out and remedy the danger existing from imperfect flues occurred some years ago at a large public building in the North of England, I forget for the moment where, but at the time the hall was occupied by a number of people, when smoke was seen issuing from behind the architrave of a door, and on removing the same, what is described as a "cavity" was found, into which burning soot had dropped, not, I believe, from the flue, but from a "pocket" in the chimney, the soot, it appears, having got there through the "with" or division between the flues and pockets having either got damaged, or been improperly constructed. I think, therefore, we may safely assume that chimneys which have been built perhaps hundreds of years cannot, under any circumstances, be vouched for as safe, at least not from any amount of external examination; and this was my view when, some years ago, it became absolutely necessary to take preventive measures with regard to some suspicious flues. My first idea was to cut away the breasts in the line of flues, and insert terra cotta or fire-clay pipes the whole of the way, but the damage that would ensue in the execution of this project to costly-finished walls rendered it practically out of the question. I found, however, that the flues, although irregular in sectional dimensions, were in no case less than 18 in. square, and that they went much straighter than ordinary modern house flues, and with these two advantages, ascertained at some trouble, I determined to try and put a new flue into an old one, by commencing near the top of the chimney. On the upper or attic floor, therefore, making sure there was no timber above that point, I cut a chase into the flue 5 ft. in length, and large enough to admit a flanged flue-pipe of 9-in. bore. Two pipes were then cemented together with a quick-setting cement,—Roman, I think,—so as to have them in lengths of 4 ft. each. A long rope was passed through the pipes, and attached to an iron bar made to securely clip the bottom of the pipe. The 4 ft. of flue-pipe was then passed down the brick flue, and another 4 ft. having been cemented thereto, and allowed to get thoroughly firm, the 8 ft. of flue was gently lowered, when another 4 ft. was added, and the *modus operandi* was continued till the throat of the fire-place was reached. The rope had, of course, to be passed through each additional 4 ft. of flue, and secured over an iron rod fixed in the brickwork above, while the cement joint was hardening. When an unfortunate "dead slant" was reached, there was no choice but to cut out the brickwork, have another start with the pipes, and make the connexion between the upper and lower portions of the new flue sound and perfect with similar pipes,—which was, of course, no great deal of trouble. On the face of it this would perhaps appear anything but a feasible project, but the actual result was a great success, as the breasts that had to be cut open were fortunately in rooms where it was of but little consequence. One flue I was enabled to pass down through a room, whose height was 24 ft. from floor to ceiling, without disturbing the wall,—a great piece of good fortune, as it was lined with marble for a considerable distance above the fire-place. Several chimneys were treated in this way, and all successfully. The Act of Parliament had occasionally to be evaded, as a boy was sent up if needed, to "ease" the pipes whenever they took to lodging on any "set-off." It was, of course, necessary to allow the cement-joints to get thoroughly secure before sending the flue on its way, and also to well secure the pipes at the bottom, otherwise the sudden appearance of the chimney-flue tumbling into the fire, might at some future time create some astonishment and alarm. The grates necessarily had to be taken out except where they were not enclosed over the fire-place. This work was done ten years ago, and no bad result has followed; in fact, an advantage arose, insomuch as the draught was increased. Before leaving this portion of my subject, I might mention with regard to flue-pipes, as an instance of the difficulty with which any improvement is forced upon public notice, that the original inventor and patentee of pipes for use in the construction of flues found his invention so little appreciated, that after persevering for some considerable time he was obliged at last to sell his stock for drain-pipes at a very reduced cost. Some discussion has taken place at times as to whether flue-pipes cause the soot to drop into the fire, and I find this is so, unless a good long easy bend is given to the line of flue, and very much so if the flue-pipes are glazed. It is for this reason, I assume, that flue-pipes are now made unglazed. Circular or elliptic flues are necessarily much more efficiently cleaned than square or rectangular brick flues, and the up-draught is much greater. It is obvious that circular-pipe flues require sweeping oftener than the ordinary kind, at least where they are swept, for I know of a number of cottages built in a country village thirteen years ago where not one has ever been cleaned, for the occupiers, to show their confidence in the fire-resisting properties of their pipe-flues, simply push up an armful of shavings occasionally and burn them out, and the flames coming out at the top pretty regularly is considered by the neighbours as evidence of the tidy habits of the respective occupiers. A good deal more might be said as to flues and flue-pipes, but not connected with fires at country mansions, and, therefore, inadmissible; but I have no hesitation in stating that the whole-socketed terra-cotta or fireclay flue-pipes, well jointed together, and encased in the ordinary brickwork of a chimney and the cavity between the perimeter of the pipes and the brickwork filled in with concrete made of coke and cement, are, as far as danger from fire is concerned, like "Cæsar's wife,"—above suspicion. Butt-joint pipes and socketed pipes with two sides cut off, cannot, I think, be considered so safe as whole socketed pipes. In connexion with brick flues there is another point as far as regards mansions in some parts of the country, viz., that a great deal of wood is often burned, and that flues get foul much quicker therefrom than when coals only are used, and also that the resins contained in wood appear to create flakes of soot of large dimensions, and more readily inflammable than those engendered from the use of coals alone. Having made the flues all right, if the grate has to be removed for the proper fixing of the first flue-pipe, it will be well to search the fireplace opening for wood plugs, and at any rate to well parge or plaster both sides and back with Portland cement and sand made from crushed coke or broken bricks, a material which will stand heat as well as any I know of, and if a chimney-beam is found to exist, to have it out at any cost. Hearth slabs, if cracked or showing danger, may have to be taken up, but I suggest that a marble or stone curb, just now in common use in good houses, can be fixed, and if the hearth-slab be of ordinary stone or other material of common character, which it would be no loss to lose sight of, a tile hearth on half an inch thick of Portland cement bedded on the slab would render any danger from wood which may be beneath practically out of the question, and the inch higher which the hearth would be above the floor should not be noticed. As the fireplaces are mostly in or about the centre of the walls, and as the beams to carry the floor joists are usually also in the centre, it follows that the ends of the beams often run into the chimney, and should always be looked upon with suspicion, for they have, in fact, been the origin of many conflagrations. Wood chimneypieces and overmantels, even wood coal-boxes, are all more or less "little helps" to a big fire, although not to be classed amongst the dangerous factors; so are wood dados, wainscotings, and skirtings, not necessarily of themselves so much as the fact that they conceal the brickwork contiguous to chimney-flues, and render the discovery of possible danger thereabouts difficult to detect. The battening and plastering or, as is to be found in many old houses, battening and canvassing, of brick walls is fraught with danger, as not only are the walls most likely plugged with wood in all directions, but the battens, being fixed vertically, form so many shallow flues, up which and behind the plaster the flames have no check whatever. Had the battens been fixed horizontally, this evil would, to a great extent, have been avoided. Fixed marble or stone curbs in place of fenders are an element of safety, as the danger of pieces of burning coal or wood falling out of the fire and lodging beneath the ordinary metal fender and igniting the carpet is avoided, so also are the slow-combustion grates, with the fire-boxes resting on the hearth, as the burning embers cannot, by any possibility, fall outside the fender curb. With regard to heating apparatus of all kinds other than the ordinary fireplace grate, old mansions stand at a disadvantage, insomuch as no provision was made in the more ancient ones for anything of the kind. Heating stoves, whether of iron, fire-clay, or terra-cotta, are safe enough in themselves if care is taken that they stand clear of all combustible materials; but it is the iron flue-pipe, necessary for carrying off the products of combustion, which must be recognised as the dangerous element. If the iron pipe is led into a brick flue, the point of connexion made sound, and no inflammable material within some feet allowed, they are of course fairly safe; but in Brecknockshire some years ago, according to a newspaper report, a fire broke out in a country church and was discovered to have been caused by a bird having built its nest at some point contiguous to an iron stove pipe, which, when heated, set the nest on fire; here, however, wood must have been not far away; possibly the flue-pipe was carried up through the roof between the rafters, and the nest might have been in the roof and out of sight. Hot air and hot water appliances are necessarily and usually indirect causes of fire, insomuch as the heat from the pipes and flues parch all woodwork they happen to be near, and render it therefore ready to ignite with the smallest provocation. In new buildings, of course, wood is kept a respectful distance from any danger points. In old buildings this is impossible, and walls, floors, and ceilings have to be cut away wherever required, and contiguous woodwork protected in such manner as seems most desirable. The small bore or high pressure hot-water heating pipes must be, I think, more dangerous in this respect than the large ones. The question was raised some years ago, and it was attempted to be proved that wood might be ignited by being placed for some considerable time against a hot-water pipe, but this is not, I believe, now considered probable.* Hot-air flues should be constructed of some uninflammable material, but I knew of one some years ago made of wood, but lined with the thinnest sheet-iron, and which joined the heating chamber. When a "big heat" was got up it was almost impossible to bear your hand on the wood casing. No expense should be considered in making the room where the heating furnace is placed and the adjoining fuel-room perfectly fire-proof. In old mansions these are generally placed in the basement, and often near the centre of the building, so that there should be as little loss of heat as possible from long flues or pipes.

Having travelled over most of the ground relative to fires which originate from constructional causes, and which probably are the origin of four-fifths of those which destroy country mansions, we come to spontaneous combustion. Although in warehouses and shops where oils and general merchandise are kept, spontaneous combustion is recognised as an occasional cause of fire, it can scarcely be considered as a very dangerous one in the case of country mansions, and probably there are only two ways in which it might occur. The rays of the sun on a hot day have been known, where the windows face the south, to become focussed sufficiently to ignite woollen materials lying on dressing-tables. This is, of course, [not a usual circumstance, but it has been the cause of fires, and at any rate might be avoided in hot weather by covering up the dressing-table with some less inflammable material. But where spontaneous combustion is more likely to occur is in the lamp or oil-room, where lamp oils, oils for domestic use, cotton waste, lamp wicks, and oily rags predominate, and where the lamp-trimming business is performed. Here, of course, the lamp-room should be fireproof in all respects, and have an iron door leading therefrom, nor should it communicate with any other apartment. No more rags, dusters, or cotton waste should be kept than necessary, and the lamp oils should be kept in closed iron tanks. An instance of the possibility of a fire from spontaneous combustion I take from the *Builder* of 1854:—"Shortly before the fire at Gloucester Cathedral, the workmen who had been engaged in polishing the throne, and other carved wood-

* Fires have been so caused.—ED.

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work in the choir, left off, it being six o'clock. Three hours afterwards the fire was discovered in a pew in front of the throne, where they had left their tools and materials. The men had been employed in applying boiled oil and turpentine in equal proportions to the woodwork, rubbing it with dry cotton rags, chiefly portions of old cotton stockings. These, after use, were placed in a rush basket, and set on the pew in front of the throne. This was exactly the place where the fire broke out three hours afterwards. Experiments have been with the view of ascertaining distinctly whether the fire might not have been caused by spontaneous combustion. The men employed placed their rags, saturated with oil and turpentine, in a rush basket as before. In an hour the outside of the basket was found to be warm, and soon after the rags began to smoke. In two hours a continuous and strong cloud of smoke escaped from the basket, and in three hours the whole burst into a flame. This experiment, we are told, was tried twice, with the same result, and it fully accounts for the fire at the cathedral on the 8th inst., and doubtless for many others." Assuming this to be substantially correct,—and there is no reason to think otherwise,—but little more need be said as to spontaneous combustion, except that when the origin of a fire is attributed to some unknown cause, this may have had something to do with it. With regard to accidental causes of fire at country mansions, these range from causes beyond personal control, such as stumbling and upsetting oil-lamps, to those that come almost within the range of incendiarism, and at any rate are cases of gross carelessness and want of common sense. What, for instance, can be said of a man who would blow out a gas-light and leave it not turned off in an unfrequented place? But I have known this in a mansion; and, unfortunately, we read of many accidents from people who will take a lighted candle or lamp to find out the cause of a gas escape. One of the leading insurance companies stated at a meeting of the shareholders soon after the introduction of lucifer matches that that invention cost them 10,000*l.* a year extra for compensation. But the danger from lucifers might be almost entirely avoided if the safety matches only were used, those which are stated to "light only on the box." Rats will run away with lucifers if they find them, and in their progress through small apertures it is not at all unlikely they may rub against a piece of wood and ignite the phosphorus, which would cause the rat to drop it at once, and leave it burning. Wax lights are worse still, as to an enterprising rat they are objects of special research, and afford him quite a banquet.

The introduction of dinner-lifts and luggage-lifts into old mansions,—some of them reaching from the basement to the attic floor,—are dangerous should a fire break out in the former, as nothing better could be devised to rapidly carry the flames from the lower to the upper regions and all intermediate combustible spots. Iron flap doors should be adapted to each floor to close the well-hole of the lifts, but I believe this is very rarely done. Gas meters should be attended to by day, and the gas at the meter should of course be turned off at night, and, in case of fire, notice conveyed to the gas-house at once that it may be shut off there also. Plumbers on roofs, using fires for their hot metal, are credited with being the originators of many fires,—Canterbury Cathedral a few years since to wit.

From the prevention we now come to the extinction of fires, which must be, of course, a matter entirely different from the system adopted in towns. A large cistern or cisterns on the roof, from which iron mains shall lead through the building, and to which hose-pipes placed in convenient positions can be attached, say in every corridor and on every landing, has been recommended; but this cannot be considered sufficient, for old mansion roofs were never made to carry a heavy additional weight in the shape of tanks of water sufficient to put out an extensive conflagration. Every 1,000 gallons of water weighs 4 tons, and nothing less than 20,000 gallons of water should be available for fire purposes; moreover, the friction, and consequent loss of head or power, would render the fire hose of very little avail in the upper story. Fire hose or hydrants inside a mansion, no matter how supplied with water, would, I think, be unsafe to rely upon entirely; for instance, assuming the fire to break out in the night, and to have gained some headway, the half-dozen or so indoor men-servants would probably think more of their own safety than in forming themselves into a temporary brigade, or the state of terror which such a disaster would occasion in the dead of the night would entirely prevent them doing what was most needed and at the precise place, while those outside who were brought to the building by the alarm of fire would be quite incapable or unwilling to thread their way through the intricacies of winding passages and corridors. A considerable amount of public attention was some years ago given to a means of stopping a conflagration by the use of vessels containing certain chemicals, which, on becoming mixed by means of a blow given to a spring attached thereto, generated a powerful gas. This was proved to be far more effectual in arresting a fire than water; but, unfortunately, the effect would be as fatal to the user as to the fire, and to remedy this, goggles have to be put over the eyes, and a shield tied over the mouth; the vessel is then strapped on the back, knapsack fashion, and with the nozzle and diminutive indiarubber tube in hand, the process of fire-extinguishing is performed. Although, no doubt, effectual at the commencement of a fire, it is apparent this can be of no use if the fire has assumed serious proportions, and the dangerous nature of the contents would prevent many from having such a fatal material strapped to them. Still, it is a useful machine, a "little help," and might, and perhaps does often, prevent a "bigger help" being needed. A suggestion was made in one of the journals at the time, when it was thought that this gas was going to prevent all extensive fires in the future, to confine it in tanks at various points, and lay it on to every room of every house, to be turned on with a tap where required as with ordinary gas or water. Possibly the householders of the period thought it was quite as pleasant to run the risk of being burnt to death as to be asphixiated by any slight escape, or accidental turning on of the gas; but this perhaps was quite as sensible a suggestion as one given by another writer, who, after a large fire in London, seriously proposed that all the water-mains might be laid along the streets on the top of the houses, so that some one had only to go on the roof and turn on a large tap, and what at the commencement was a fire would in the end become a deluge. Equally useful are the small hand-engines on two wheels, which can be carried or wheeled through any door, but must necessarily be supplied with water from the nearest taps by means of buckets. The advantage of these little engines is that the water can be directed to a considerable height, where perhaps it would be impossible otherwise to reach, or the heat would be too great to approach with ordinary hand-buckets. It is needless to say that where a smell of burning wood is discovered and cannot be detected, the spot should not be left night or day, for it might smoulder for many hours, and that water should be got ready for immediate use if required. But there are many mansions where scarcely any facilities exist for the extinction of fires; and, on the other hand, there are many where every possible means within reason are adopted, and if I describe the means at one of the latter class, that comes within my knowledge, it will answer the purpose as well as any other I can adopt.

My typical mansion stands on an eminence, miles away from any fire-engine. Below it there runs a river, and behind, but about half a mile distant, the ground rises very considerably. At the river side, and at some litte distance from the mansion, is a water-wheel, and formerly this wheel was the motive power which forced the water from a shallow well near the wheel to a cistern on the roof of the mansion. At present an artesian well near to the water-wheel supplies the water, which is forced by the wheel and a treble-barrel pump through a 4-in. cast-iron main, to a tank made in the ground, holding 20,000 gallons, on the distant hill, three-quarters of a mile away, and 40 ft. above the level of the highest part of the mansion. About half-way between the water-wheel and the tank, and at the nearest point to the mansion, a 4-in. branch is taken off the 4-in. main, and carried first all round the mansion, and then in the building, to ordinary domestic service cisterns on the roof. On its way to the roof 2-in. brass pipes are taken off, and to these branches are attached hydrants at various landings and accessible parts of the building. On the outside hydrants are placed in the grounds, about 60 ft. apart, attached to the 4-in. pipe. The underground tank, holding 20,000 gallons, in addition to serving the mansion with water for domestic use, supplies also a farm and all the buildings which the pipes pass on their way from the pumps. But as the water in this tank is being continually drawn for general use, a larger open tank, holding 100,000 gallons, has been made near thereto, the water in which is entirely reserved as an auxiliary supply, in case of fire, and is prevented from entering the main by a stop-cock placed on the same; 300 ft. of fire-hose, with nozzles already attached, hang on pegs, just within the building, for the outside hydrants; and other hose-pipes are suspended over each of the inside hydrants. Here, then, is every facility for discharging an immense quantity of water on the highest part of the building as soon as the hose can be attached to the hydrants; but, in addition, fire-buckets hang in a row in the hall, electric alarm-bells are fixed to each external doorway, a fire annihilator stands ready to be buckled on any one who has no fear of being asphyxiated, telephonic communication exists between the mansion and the stables, the home farm, and the clerk of works' house, so that help could be obtained quickly; also telegraphic communication to the nearest town; a watchman perambulates outside the building all through the night, whose movements are known by a tell-tale clock, the register of which is carefully taken every morning, and fire-ladders also hang up adjoining the house and which will reach to the roof. Of course, in case of accident, there are stop-cocks at different points of the main, but these are usually kept open, and, at any rate, a white post is placed against each, on which is distinctly painted, "Fire-cock, turn left to right," and the keys for these hang at the nearest convenient place, well known and constantly in sight of all whose business brings them near thereto. It is obvious that in the case described the conditions are favourable for an efficient supply of water at high pressure. Were no such facilities available, a steam-engine would, of course, be necessary to pump the water, and a water-tower built, having a large iron tank on the top. I am told that the cost of maintenance of the whole system of water supply and distribution described does not exceed 100*l.* a year, excluding the wages paid to the watchman, which are not taken into account, as his functions are more especially to arrest the progress of any one having burglarious proclivities. I may incidentally mention, with regard to the appliances in use for the protection of mansions from fire, that both leather and indiarubber hose are unsuitable, not only on account of their weight and cumbersomeness, but more especially because they are liable to crack when not in pretty constant use, and that the best for the purpose is "Vaucher's Canvas Hose," which is light, economical, and capable of standing a high pressure of water. The water in iron mains should not be allowed to remain there more than a month, otherwise the oxidation of the iron has an injurious effect upon the hose when the fire appliances are all under trial, which, of course, should be at stated intervals. But there is a weak link in the chain, even in the arrangements I have just described, for should a fire break out in the night, some considerable time would elapse before sufficient help could be obtained, and in the meantime, unless kept in check, an uncontrolled fire raging in the midst of a mass of parched timber and other combustible materials would probably defy the endeavours, no matter how energetic, of men with no experience as firemen. This is a difficulty not easy to cope with, although I believe an instructor is sent from the London Fire Brigade to many private residences in the country at a low charge to give instructions how to act in case of fire. It is a well-known fact, however, that many persons when called upon in an emergency at a moment's notice to assist at some sudden calamity, for which they have had no intimation and no previous experience of a similar character, "lose their heads," and some extraordinary tales are known and told of the doings of people placed in that position. Incidentally, I might mention that formerly the members of fire brigades in country towns, and London also most probably, were selected from mechanics and others employed in building operations, probably because they were more accustomed to "run ladders" than any other class, and I believe this system still obtains in some parts of Germany and other portions of the Continent. It

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is passing strange to note the money expended in ways and means for the prevention of fires, and the actual money loss sustained through fires, and yet to find that nine-tenths of the buildings erected appear to be built expressly to be burned. Let the casual observer take his stand in an ordinary building when "in carcass," before any plastering or flooring is laid, and look round him. He will find the wood very fairly distributed for a good fire, or rather a bad one; and then let all the wood that is to come in for finishing be distributed about,—plastering laths, floor-boards, doors, stairs, skirtings, fitments, &c.; then add the wood furniture, and he will behold "wood to the right of him, wood to the left of him, wood in the front of him, wood everywhere." I find in an ordinary house just erected, and standing on an area measuring 56 ft. by 36 ft., that the actual weight of wood of all description used in construction thereof is about twenty-nine tons. Now, what chance is there of checking a fire which, unobserved, has made considerable headway in an area of 224 superficial yards, in which there is heaped up as much wood as took twenty-nine horses to draw there, and no means of obtaining water except as much as can be pumped up by an ordinary hand-pump from a well?

A writer in the *Manchester Courier* some years ago stated that in Japan the law was that the occupier of every house burned down, whether accidentally or otherwise, should be beheaded; and the same writer follows up this statement by gravely remarking, "there are very few fires in Japan." Now, this law might be profitably copied in this country, with certain amendments,—for instance, transfer the onus of responsibility to the builder; make the law provisional, say for the next twenty years, and to apply only to buildings erected after the passing of the Act. This would do more towards rendering our habitations fireproof than all the moralising and preaching that has taken place these last forty years, and, when once fireproof buildings were found to be as easy to erect as combustible buildings, no one would be found to occupy one of the latter with the chance at some future time of being roasted alive. I grant, builders would raise personal objections to an Act of Parliament that would virtually hang the sword of Damocles over their heads for the rest of their days; but every national benefit must of necessity press heavily on an infinitesimal portion of the population for a time.

Seriously, the saving of valuable property and valuable lives, simply by making our habitations to all intents and purposes fireproof, will not be accomplished until it is made penal to build them otherwise. The thin end of the wedge has been inserted in certain rules and regulations laid down by the municipal authorities in large towns with regard to the use of wood in buildings; but beyond this, with our national disinclination to do matters different from our forefathers, no further steps will probably be taken to prevent loss of life and property from fire for the next century or so.

I must plead in extenuation of all weak points contained in this paper, that it is a subject upon which, compared with many others, but little has been said or written; on that account, however, perhaps it may be the more interesting to the members of this Association; at any rate, if it be the means of helping to prevent in the future such losses as have lately occurred in the burning of Ingestre Hall and Clevedon Court, my time will not have been wasted in drawing attention to "Fires at Country Mansions and Suggestions for their Prevention."

At the conclusion of the paper a hearty vote of thanks was accorded to Mr. Potter for the very able manner in which this subject had been brought before the members.

The discussion on the paper was postponed until the next monthly meeting.

Taunton.—The fifteenth-century nave roof of Thorne Faulcon Church, near Taunton, has just been substantially strengthened and repaired, and re-covered with Delabole slating. The lath-and-plaster ceiling has been removed internally, the old oak ribs repaired, renewed, and brought to light again. A curious oak cornice of the middle of the seventeenth century was found concealed under a much later plaster cornice. English oak boards in narrow widths replace the lath-and-plaster ceiling. The work has been executed by Mr. Hawkins, of Glastonbury, under the superintendence of Mr. B. Edmund Ferrey.

BUILDING FRONTAGES ON THE THAMES EMBANKMENT.

WE regret to hear of a proposal by the City Lands Committee of the Corporation of London to let the vacant land adjoining the City of London School, at the Blackfriars end of the Thames Embankment, for building purposes, without any restrictive conditions as to the line of frontage to be adopted in the new buildings facing the Embankment. A board has been set up on this vacant land showing the proposal of the committee of the Corporation.

Mr. H. W. Brewer writes to the *Graphic*:—

"I venture to suggest that the proposal of the Corporation of London, if carried out, will, to my mind, quite ruin the picturesque effect of a large portion of this fine esplanade, viz., the part which extends from the Temple Gardens west to the City of London School east. The proposal in question is to bring forward the houses erected upon this site to the line of the street, or rather footway, instead of keeping them back to the inner line of the Metropolitan Railway. The effect of this will be to make the Embankment look very narrow, and the fine view of the Temple buildings and their beautiful gardens will be entirely built out when looking from the City end or from Blackfriars Bridge, while the noble gable of the City School will be blocked out when looking from Westminster. Unless the matter is brought to the notice of the Corporation in some of the papers, this plan will be carried out, and the opportunity of making a really grand thing of the Embankment lost, and this after so many thousands have been expended upon it. . . . . The ground does not appear to have been sold at present, and it is not impossible that an appeal to the Corporation upon artistic grounds might cause reconsideration of the present scheme Although setting the houses back would cause a certain pecuniary loss, yet I believe that the City authorities would be willing to make the sacrifice, if they could be convinced of its extreme advisability. If, however, the question is not taken up at once, it will be too late, and the opportunity of reserving this fine open space, with its remarkably picturesque outlook, will be for ever lost."

We agree perfectly with these views, and it only needs a visit to the spot to see how the general appearance of the Embankment would be damaged by a number of ordinary house-fronts coming right up to the line of the foot-path. If ever there was a good opportunity for creating a shady boulevard or garden, with advantage to the public, it is here. There is every reason why the building line should be set back at least as far as the front of the City of London School, leaving as an open question the method of dealing with the land immediately on top of the Metropolitan District Railway tunnel, whether by forecourts or gardens attached to the houses, or by a shady public walk planted with trees. If the Corporation of London, through the City Lands Committee, could be persuaded to set back their frontage-line as far as the south end of the buildings in King's Bench-walk, the artistic effect would be greatly enhanced; but we fear this is too much to hope for. We are informed on good authority that the retaining-walls of the railroad beneath this land are certainly not strong enough to carry the superincumbent weight of lofty buildings; and the presence of two ventilators in the top of the tunnel renders the land still more difficult to deal with as ordinary building land. Can it be that the Corporation of London, which through one of its committees has behaved so generously in giving to the London public the costly land and buildings of the new City School, will stultify itself by allowing another of its committees to spoil its own work by letting this adjoining vacant land without restriction as to building-line, in order to obtain a few hundreds a year extra income in the shape of ground-rent? Surely any private landholder owning this land would insist upon a set-back line; and, if so, should not the Corporation (who are, in fact, trustees of the public) deal with this land in the most liberal spirit? Has the Superintending Architect of the Metropolitan Board of Works no power to define the line of building frontage along the Victoria Embankment (the finest road in London)? Or is it the voice of the Press only, and public opinion at its back, which shall prevent this great mistake?

The Electric Light at Brighton.—After a long discussion, the Brighton Town Council on Wednesday resolved to apply for a provisional order under the Electric Lighting Act. The draft order provides for the compulsory lighting of a considerable area of the town.

WEST LONDON SCHOOL OF ART.

MR. MUNDELLA, M.P., ON ART-TEACHING.

THE annual presentation of prizes to the students of the West London School of Art took place last Monday evening in the large room of the School, Great Titchfield-street. The Right Hon. A. J. Mundella, M.P. (vice-president of the Committee of Council on Education), presided, and was supported by Mr. F. Davison, Mr. J. D. Crace (hon. sec.), Mr. Robert W. Edis, F.S.A., Mr. W. J. Holland, Mr. G. A. Thrupp, &c. There was a very large attendance. The walls were hung with some excellent drawings and paintings executed by the students.

Mr. Mundella, M.P., who was warmly received, said:—Ladies and gentlemen, it is my first duty to call upon your head-master, a very old friend of mine, whom I am glad to see at this West London School of Art, to read the annual report. Mr. Rawle, I may assure you,—and I dare say most of you know,—is a gentleman who acquired a very high reputation for what he had done in a provincial school with which I for many years was connected. His exertions in the town of Nottingham are remembered with gratitude, and the trade has flourished in a great measure from the impulse he gave to art-teaching there.

Mr. John S. Rawle then read his annual report, from which it appeared that 558 students attended the school, showing an increase of one on the previous year. The day classes were attended by 160 students, and the evening classes by 398. The school fees show the highest amount ever received, namely 868*l.* 8s. 7d., giving an increase of 42*l.* on the year 1881, and an increase of 110*l.* 5s. 2d. on the fees for 1880. The Government payments on results amount to 435*l.* 14s. 11d. "Last year we received 440*l.* 13s. 4d., and in 1880, 347*l.* 3s. 3d. We sent 3,896 works, executed during the year, to South Kensington, for examination, against 3,888 in 1881, and 2,577 in 1880. We have, this year, taken exactly 25 per cent. of the National Competition Medals, &c., awarded to the thirteen Metropolitan District Schools of Art. In the highest, or 'Third Grade Government Advanced Examinations,' this year, we have reached our highest point of success, twenty-nine students having gained twenty successes, against eighteen last year, and fifteen in 1880. Forty-eight works were considered worthy of 'Government Third Grade Prizes' in the advanced stages of study. Twenty-seven gained this distinction in 1881, and twenty-two in 1880. Nine students gained 'Government Free Studentships' against eleven in 1881, and two in 1880. In the Elementary, or 'Second Grade Government Examinations,' in freehand, geometry, perspective, and model drawing, we gained thirty-two prizes and 105 certificates, total 137 successes. In 1881, there were twenty-two prizes and ninety-seven certificates, total 119 successes. In 1880, the number of successes was 101. With regard to the 'Government Payments on Results,' in 1881, the West London School gained a higher grant than any other school in the kingdom. The payment on results is the best testimony as to the general quality of the whole work of the school."

Mr. Davison then submitted the financial statement, from which it appeared that last year there was a deficit of 1,305*l.* An appeal had been made, with the following result:—The Duke of Westminster, 100*l.*; Mr. Tarn, 100*l.*; Mr. Crace (hon. sec.) and his father, 100*l.* In all 769*l.* had been collected, thus enabling the school to discharge a considerable portion of its liabilities.

Mr. J. D. Crace, hon. sec., said that in regard to the travelling studentship, he believed this was the only school which possessed one, and in future the committee would be obliged to demand very close attention to the conditions attached to that prize, viz., the study of ornamental and applied art, the value of which could not be exaggerated.

Mr. Mundella then addressed the students at some length on the subject of art education. He wished, he said, first to explain the reasons which induced him to come amongst them that evening. In the first place, he had a very cordial invitation from the committee, amongst whom he found the names of gentlemen who had won for themselves a very high and an honourable distinction in connexion with art industry and art manufactures in this great metropolis. In the second place, when he submitted the request of the committee to the

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authorities at South Kensington, the Art Director was as pressing as Mr. Crace that he should pay a visit to this school, which, he said, was one of great promise, and one of the best of its kind in the metropolis. Moreover, it was pointed out that the school contained the right elements, and on that account especially deserved encouragement and support, for it was composed in a very large measure of two classes,—of the employers of art workmen, and of those employed in connexion with industrial, decorative, and ornamental art. He had spent a great part of his life as an employer of labour, to a very large extent, in one of our provincial towns, and at the head of their school of art they had that excellent master, Mr. Rawle. He (Mr. Mundella) consequently wished to be present that evening to see what progress had been made. If he wished to point to a successful school of art he should choose that at Nottingham. The lace-manufacturers of that town had thrived and were aggressive against the manufacturers of the whole world, and they were now competing most successfully against France, mainly because they had applied good art to manufactures. Then this school, it was pointed out, was composed of the two elements which wanted bringing together in order to place England pre-eminent in art,—the art-employer and the art-workman. Of the 550 students, he believed considerably more than half were so employed daily. It was precisely the object for which the Government originally founded and subsidised schools of art. The first grant,—1,500*l.*,—to encourage art as applied to industry, was made through the Board of Trade in 1836, and that body administered the gradually increasing grant down to 1854, when the duty was transferred to the Science and Art Department. The object of the Government was not to create producers of "pot-boilers"; not to increase the number of pictorial artists who every year found some thousands of pictures rejected by the Royal Academy. Their object at South Kensington was not to double the number of these rejected pictures,—that was the work of the Royal Academy. If, as had been said, the South Kensington School contributed 25 per cent. of the students who entered the Royal Academy, they contributed too many. A jealousy had been assumed by some people to exist between South Kensington and the Royal Academy, which was a pure fiction. There could be no jealousy or conflict, and he was fully convinced that South Kensington had been eminently successful in accomplishing the object for which it was established. Speaking on that occasion, as Vice-President of the Council, he was only expressing the opinion he, himself an employer of art-labour, had long since formed, when he stated that South Kensington had been eminently successful in accomplishing the object for which it had been established. Art schools had accomplished their original purpose. He had already shown that the first grants in aid of technical art-training had been very small at the commencement. But in 1851, the first Great Exhibition was held Perhaps but few present could remember that exhibition, but he remembered it well, because he had not only been an exhibitor in it, but he had been a commissioner for his own locality. He had, moreover, a very lively recollection of the character of British art which was shown at that exhibition. It appeared to him in 1851, and he held the same opinion still, that if all the British art work of the first half of the present century, in its wall papers, its decorations, its hangings, and its very heavy furniture, had been collected in one vast pile and burned up, the world would not have been any the worse for it. Of one thing he was quite satisfied, and that was, whatever fashionable craze might prevail in the future, no one would ever dream of making a collection of the furniture and other works of decorative art of the first half of this century. We might well look with pride upon the productions of the days of Queen Anne, which had been designed by men who, although they made furniture, — like Chippendale, — were great artists; of the days when Flaxman designed for Wedgwood; and when the architect left the impress of his genius, not only on the structure of the house, but upon its very door-knocker. It was impossible to compare those beautiful works of art with the clumsy productions of later times without astonishment that the taste of this country could have so immensely degenerated. Our deficiencies having been made very plain to us in 1851, they owed the greatest debt of gratitude to the late Prince Consort for the stimulus he had given to art and to art manufactures and industries in this country. The effect had been seen in the last thirty years' subsidy of art in educating, first the customer, then the producer, and then in the increasing art merit of the productions. In his own town thirty years ago, if a designer was wanted they sent to France for him,—to Paris,—Englishmen being considered as destitute of originality; while now, so totally had things been altered, it was thought that Englishmen had more originality and feeling for art than Frenchmen, in spite of their great advantages of living constantly in an atmosphere of art, amid art classes, and with an enormous demand for art productions. Every exhibition which had taken place since 1851 had shown the enormous strides England had been making, until in 1878 the French had fairly stood aghast at the products of some of our London furniture houses, for instance, as also in the case of the marked advance shown in every article exhibited by British manufacturers. Where, now, was to be seen our heavy and inelegant mahogany furniture, our carpets, with their lions and tigers and impossible animals, our hideous wall-papers, with their baskets of fruit and gaudy colours? These atrocious productions had all disappeared, he hoped never again to return, and their place had been taken by works of art of the graceful design and exquisite workmanship which now gave us so much pleasure and enjoyment as we saw them in our shop-windows in walking along the streets of London. While, however, we had undoubtedly achieved a great success in the cultivation of a taste for applied art, we could not afford by any means to rest content with our present advance. It was true that this development of artistic taste had enormously increased the demand for our art products throughout the world, and had given as great a stimulus to our export trade, but we must not forget that we were about to be exposed to a very severe competition. Let them see for a moment how this great advance, of which he had a right to be proud, had been brought about. The amounts spent by South Kensington since the Science and Art Department had taken up this branch of instruction were as follow:—In 1862, the total grant made to schools of art in England was about 12,000*l.*; in 1871, 30,000*l.*; in 1877, 62,000*l.*; in 1881, nearly 70,000*l.* As to numbers taught, in 1857 30,000 children had received instruction in free-hand drawing in the elementary schools of the country; in 1862, 71,000; in 1871, 166,000; in 1877, 541,000; and in 1881, 850,000. The art classes had gone on increasing from about 3,000 or 4,000 in 1857 to 23,000 in 1881. The provincial and metropolitan schools of art, including the National Art Training School at South Kensington, had, in 1857, 11,000 students; in 1862, 13,000; in 1871, 21,000; in 1877, 29,000; and in 1881, about 32,000. The total numbers taught and aided by the State, under the Science and Art Department, were as follow:—In 1857, 43,000; in 1862, 87,000; in 1871, 212,000; in 1877, 610,000; and in 1881, 917,000. So it would be seen we were doing something considerable in the way of teaching art, but they might be sure that at South Kensington they would not rest content until there was a new departure and a real improvement. He would give his reasons. In the first place he was surrounded by prizes. Prizes were all very well when students had to be bribed to come and be taught, but he was doubtful whether it was the best way of giving rewards. About 10,000*l.* a year was spent in this way. He thought the students would be aided more by giving them better examples, by giving free scholarships, and by assisting travelling studentships. It was the mark of merit that was wanted. The soldier died for a little iron cross, and the artist would be just as well content with the certificate which marked his progress as with a prize which had a certain money value. This was one of the subjects which was occupying his attention at the present moment. He believed that sufficient stimulus and emulation might be created by other means, and that the money might be employed better than as at present. The reason why Englishmen must not rest content was because they were threatened with a competition impossible to describe, and hardly, if possible, to exaggerate. He had spent some time in learning what was going on in France in the direction of encouraging instruction in art, and he was astounded at what he had seen. In every *arrondissement* he found placards offering gratuitous instruction in art to any person employed in this or that trade who would accept it, and he saw schools of art everywhere thronged by hundreds of students. Now this was done by the municipality; it was actually out of the rates and taxes that the Parisians paid the cost of the whole of the art education of the artisans of Paris. In the coming year the municipality of Paris would spend in this way 32,000*l.*, and the following year a much larger sum. From the budget of the city of Paris he learned that for 1,900,000 inhabitants education next year would cost more than double the amount expended for the four millions of people of London. These facts ought to be known, for their effects would have to be met. Last year a commission had been appointed to inquire into technical education throughout Europe, and when the commissioners came home they would pour into his ears the different facts in relation to the subject which they had collected, and he was astounded in regard to the tremendous energy and the lavish expenditure now going on in Continental countries, which had been stirred up mainly by what they saw England had been doing, and next by rivalry with each other. Professor Roscoe had told him of a visit made to an Art and Science School of Rouen, where amongst the scientific and art collections to aid in the work of teaching was found a Prussian spiked helmet, or *Pickelhaub*, used by the teacher to stimulate the students when they gave any signs of flagging by producing it, and crying, "*Travaillez, travaillez, messieurs*; France was humiliated and we also in this city of Rouen, because our enemies were better instructed than we were." That was the kind of impulse that was being given to instruction to every department of industry in France, because they felt they had been left behind somewhat in the race, and they were now looking to education in every department to place their country in its old position of renown. Thank God, we had nothing to fear from the invader, but what we had to fear was lest by lack of enterprise we should fall back in our industrial career. There was nothing which would do so much to keep our manufactures, and every product on which the impress of art could be put, as thorough art-teaching. If Englishmen wished to hold their own as art-workmen they must be prepared to compete with a race in France, in Belgium, in Munich, and in Dresden, who had the advantage of generations of art-traditions, who lived in an art-atmosphere, and who had always before them the best forms and examples of art-work. At Rouen artisans might be seen in large numbers working at their studies at night, with their coats off, for two hours on six nights in the week, diligently improving their minds and acquiring skill at the conclusion of a hard day's work. At Liège, in Belgium, with its population of 100,000, 6,000 young men were at work in the Art and Science Schools every night. Only recently in Paris 300 artisans engaged in a competition in modelling, and were at work from nine in the morning until five in the evening. In these circumstances, we ought to fear lest by our own negligence we should hold back, for nothing would so much keep our industries and manufactures to the front as art-teaching. There was another point to which he desired to refer before he sat down, and that was with regard to the feeling that was too apt to be entertained in this country that decorative and applied art was degrading to the artist. He trusted that before long we should entirely get rid of that false notion. John Ruskin, who knew something about this subject, wrote the following: "The only essential distinction between decorative and other art is the being fitted for a fixed place, and in that place related, either in subordination or in command, to the effect of other pieces of art. And all the greatest art which the world has produced is thus fitted for a place, and subordinated to a purpose. There is no existing highest-order art but is decorative. The best sculpture yet produced has been the decoration of a temple front, the best painting, the decoration of a room. Raffaelle's best-doing is merely the wall-colouring of a suite of apartments in the Vatican, and his cartoons were made for tapestries. Correggio's best-doing is the decoration of two small church cupolas at Parma. Michelangelo's, of a ceiling in the Pope's private chapel; Tintoret's, of a ceiling and side wall belonging to a charitable society at Venice; while Titian and Veronese threw

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out their noblest thoughts, not even on the inside, but on the outside of the common brick and plaster walls of Venice. Get rid, then, at once of any idea of decorative art being a degraded or a separate kind of art. Its nature or essence is simply its being fitted for a definite place, and, in that place, forming part of a great and harmonious whole, in companionship with other art; and so far from this being a degradation to it, so far from decorative art being inferior to other art because it is fixed to a spot, on the whole, it may be considered as rather a piece of degradation that it should be portable." It must not be forgotten that the Italian artists of the Renaissance began their careers in the workshops, and that it was only by degrees that they developed into the skilful men they became. So much for the work which art-training produced; but they must not lose sight of the enormous advantage it was to the worker himself. Possessed with a knowledge of art, he felt his work cease to be a mere dull mechanical drudgery, and his labour in producing that of which his mind could appreciate the beauty became a pleasure instead of a toil. In conclusion, Mr. Mundella said they had a good deal to do in the future, and he was glad the London School Board was about to begin by engaging Mr. Bradford to put drawing in elementary schools on a better footing.

The right hon. gentleman, who was frequently applauded during the delivery of his address, then proceeded to distribute the prizes.

Mr. Thrupp then proposed a vote of thanks to the masters of the teaching staff.

Mr. Davison seconded the motion, which was carried.

Mr. Rawle briefly returned thanks.

Mr. Edis, in proposing a vote of thanks to the chairman, said that they all appreciated the address just delivered, which he hoped would be read throughout the country. He trusted the Vice-president of the Council would lend them some of those wonderful treasures that were stored at South Kensington, so that they might have before them to copy the highest types of art.

Mr. Donaldson having seconded the vote of thanks, it was also carried.

Mr. Mundella replied, and the proceedings then terminated.

HORTICULTURAL BUILDINGS.*

No paper on horticultural buildings would be complete without a reference to glass and glazing. As you are aware, for clear glazing, 21-oz. English sheet is generally used. Thinner than this is not advisable; neither is Belgian glass so desirable as English. Wavy speckled glass is apt to scorch plants. For a semi-obscure glass, Hartley's rolled plate is generally used.

Touching the mode of fixing the glass, I have unhappily come to the conclusion that for use in purely growing horticultural houses, no system hitherto invented is more advantageous than putty glazing. I say "unhappily," because putty glazing is by no means perfect: the putty is apt to peel off, crack, form crevices for the retention of moisture and insects, and cause the woodwork to rot. Then it is troublesome, to a certain extent, to renew putty-glazed glass when necessary, as well as to put it in in the first instance. There can be no doubt that horticulturists generally would welcome any advantageous method of superseding putty glazing; but there can equally be no doubt that for use in purely growing horticultural structures, putty glazing yet holds its own.

I will briefly run over some of the characteristic features of mechanical glazing:—In some systems the glass is held in its place by metallic clips; in others by compressible metallic bars; in others, between wedges of lead; in others, between strips of vulcanite or other elastic substance (the glass and such elastic substance being held in their position by wood or metallic capping and screws); in others, the glass drops into grooves prepared to receive it. Now in all of them the glass comes in contact with either a metallic or an elastic substance. In the former case, there must be a sufficient amount of "play," or the glass will certainly break; in the latter case, the elastic substance is found in practice,—chiefly in consequence of internal moisture, excessive variations in temperature, and atmospheric influences,—to give far more trouble to gardeners than putty properly made and applied. If, on the other hand, there be any "play" between the glass and whatever it touches, hot air has abundant opportunity for escape; such a house cannot be properly fumigated; crevices for the retention of water by capillary attraction abound; subsequent freezing of the water and breakage of the glass are liable; and the same crevices which hold the water will harbour insects,—all most serious disadvantages from the point of view of a horticulturist. Of course, for other than strictly growing glass houses, mechanical glazing may frequently be employed with benefit.

The most usual form of ventilator is a framed light, hinged at the top, and opening from the bottom outwards. Sliding sashes for roof ventilation have almost gone out of fashion, except for simple frames, low pits, and houses in which the roof requires, at certain times, to be practically stripped. For any other purposes sliding lights are cumbrous and unmechanical, and a roof in which they are fitted requires to be abnormally heavy, and affords great obstruction to the solar rays. Both top and bottom ventilators should extend along the whole length of a house, except, perhaps, in the case of the top ventilators of a span or three-quarter span, which may often be arranged alternately on each side of the ridge. Continuous ventilators, then, being necessary, consecutive lights may be made to open simultaneously, or each can be arranged to open separately. Unless, however, there are a great number of lights to manipulate, or unless they are not easily accessible, it is generally advisable to adopt the latter course; for, obviously, it may not be advisable to have exactly the same area of ventilation along the whole length of a house. At one part there may be plants which require a more constant and copious renewal of air than at another part. If lower vertical lights or ventilators are opened separately, then the ordinary notched hand "set-opens" may be used. If top-roof lights are opened separately, then a quadrant bar terminating in an eye may be fixed to each light, and actuated by a cord held by a counterbalance weight or a hook in an adjoining wall or mullion. When, however, to save time, the large number of ventilators to open, or from inaccessibility,—as, for instance, when a vine-border or a great width of staging in front of the ventilators necessitates their being opened simultaneously, the best gear to use is that consisting of a pair of double-jointed arms attached to each light and keyed to a bar held in blocks fixed to the mullions. The partial rotation of the bar and opening of the lights may be effected by a handle keyed on to the bar at any part moving in and pinned to a quadrant or half circle; or the motion can be conveyed by a connecting-rod to some distance. Similar apparatus may be used to actuate top-lights. These double-jointed arms are better than any other form, for they never offer an obstruction to pots, plants, foliage, &c.

Roofs have occasionally to be wired, in order to support foliage trained near them. In practice I find the best way to wire roofs is as follows:—Suppose we have a lean-to to deal with: take two flat bars turned edgewise, and suspend them at back and front by holdfasts, bolted at back through the wall, and at front into the mullions. Then at the necessary intervals stretch wires by means of *raidisseurs* to these two bars. Intermediate parallel bars, dependent upon the length of rafter, may serve to support these wires. The wires can thus be at short, long, or irregular intervals, or at any time, and as frequently as required, the distance apart of the wires may be altered. In this way they help to tie in the roof, enable painting and repairs to be more easily effected, and are more easily adapted to the wants of the gardener than fixing wires permanently and separately at right angles to the rafters. The wire I generally employ is galvanised iron about No. 12 B.W.G., each spaced say 10 in. apart, and 10 in. from the glass.

Soon after commencing this paper, I mentioned that growing-houses might be divided into three classes,—those adapted for plants, those for the cultivation of roof-fruit, and those having beds for bottom or root heat. In planning the staging in a house of the first class, the points to observe are facility of drainage from pots, economy of space, accessibility, proper distance from glass, depending upon the height of plants to be grown. A house about 11 ft. wide is a very favourite form with nurserymen. So far as the materials are concerned of which stages are composed, for ordinary plant-growing the usual lattice-wood stage, composed of 3 in. by 1 in. laths with ¾-inch spaces between them, is very suitable. When, however, the pots or plants require to be plunged in damp moss, sand, shingle, &c., then carefully drained concrete, slate, or zinc-lined wood stages may be necessary. The chief characteristics of a house of the second class are, framing wires along the roof, a prepared border about 3 ft. deep, and provision for thoroughly draining this border, and for preventing the roots of vines planted in it from penetrating to the subsoil. If the subsoil be of a retentive nature, then you must have concrete or other impervious base, on this, rubble; then turf, grass downwards; then the compost forming the border proper. If the subsoil be of a porous character, then the concrete base may be omitted. It is generally considered best for the border to run outside as well as inside; therefore the front wall should be built on arches, or composed of iron uprights filled in above the ground-line by slabs of slate. The total width of a border should, if possible, equal the width of the house. A forcing-pit may be taken as an example of the third class of growing-houses. The chief characteristic of this class is an arrangement of hot-water pipes for heating the soil of which the bed is composed, supplementary to and independent of the pipes for atmospheric heat. The pipes may be carried through the actual bed itself, or, what is better, they may be carried through an air-chamber under the bed. In this position the vapour troughs with which they may be fitted are more accessible, and the whole arrangement is certainly better than the previous arrangement, which necessitates water passing through the bed before it can be vaporised by the pipes. Although it is advisable to keep these three classes of houses distinct when treating of them, yet it is sometimes necessary to effect a compromise and grow grapes and plants, or plants and cucumbers, in the same house. For instance, a lean-to house may have a vine border in front and a tiered stage at back; or a span-house may have a forcing-bed on one side of the path and a stage on the other. Of course it is understood that when the functions of different classes of houses overlap one another, a high degree of cultivating efficiency is apt to be sacrificed.

I have hitherto been speaking of growing-houses. I should like, in conclusion, to say a few words upon conservatories or showing-houses. By these I do not mean winter gardens, in which palms and other large specimens of vegetation are permanently planted, but just ordinary conservatories, with numbers of which architects may expect to come in contact in the course of their professional work. At the outset several points must be kept in view. 1. A conservatory must be treated as one of the reception-rooms of the dwelling-house. 2. Without departing from its strictly horticultural character, we must endeavour to make it approximate architecturally, both inside and out, to the other portion of the dwelling-house. 3. This being so, we must regard the functions of growing and showing as quite separate. I am perfectly aware that many cases exist in which it is necessary that growing and showing be accomplished in the same house. In such cases a compromise must be effected, for if all the conditions of growing be complied with, the conditions of showing will suffer, and *vice versâ*. Let us endeavour to crystallise these abstract ideas into a few concrete facts. In a house in which plants are grown, it is generally essential, as you have seen, that they be not at a great distance; therefore low eaves, say, 5 ft., and interior high-tiered staging, may be not only desirable, but necessary. In a conservatory the eaves have frequently to be from 9 ft. to 12 ft. high, and interior staging dispensed with. We generally have a choice of aspect for a growing-house; the site of a conservatory is generally dependent upon proximity to a drawing-room or hall, where frequently the sun cannot reach it. A growing-house may have scantling as light and unobstructive to the solar rays as possible; a conservatory may require to have heavier scantling, and, to a certain extent, obstructive ornamentation. In a growing plant-house, path area is generally economised as much as possible, in order to obtain the maximum growing area; in a conservatory a different disposition of paths is necessary. Summing up the chief points to be

* A paper by Mr. F. A. Fawkes, read before the Architectural Association on the 8th inst. See p. 774, *ante*.

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observed in designing a conservatory, I would say,—Construct it in harmony with the adjoining or surrounding architecture. Give as much light as you can. Ornament the construction: never construct the ornament. Interest and pleasure should be excited by the broad lines of a conservatory rather than by meretricious ornament and fussy detail. When will the world, especially the architectural world, recognise that art and simplicity do not form an irreconcilable combination? Touching the interior, I would say,—Throw away stages, hide the pots, and let us see natural beds and banks of foliage and flowers massed with artistic irregularity. Let there be an ample paved space,—not a mere path,—but a space so that a table and a chair or two may be placed in it. Let the conservatory be regarded more as a lounge than a mere place to walk round in single file. If the size and nature of the conservatory permit, then rockwork, a fountain, or sculpture may find a place in it. Baskets of hanging foliage look well. Bare walls, as well as other parts of a conservatory, may have creepers upon them. A grass mat or two may be thrown down here and there, and a parrot advantageously introduced. Sometimes an awkward space in the brickwork may be easily turned into an aviary. In fact, while not sacrificing the strictly horticultural *raison d'être* of the structure, a judicious combination of art with nature may intensify the enjoyment derived from a conservatory, and the beauties of the plants and flowers may be absolutely enhanced by the introduction of such artistic accessories as I have mentioned.

NEW SUBSTITUTE FOR GYPSUM.

A SUBSTANCE has been introduced in Germany for industrial uses which is alike applicable to castings of figures, ornaments, &c., instead of gypsum, and also in the form of paint to the impregnation of tissues and wood. Its resisting properties are stated to be equally effective against the influences of weather and of fire. It is described in a German technical journal as being capable of taking a high polish. It is composed principally of fluor-spar or chryolith, in combination with fire-proof white sand, zinc-white, hydrate of lime, sulphate of baryum (natural and artificial), silicate of magnesia, powdered quartz, &c., together with moderately-concentrated soluble silicate of potash. This mixture is carefully stirred together, and is cast in gelatine or other moulds.

STEVENS AND ST. PAUL'S.

SIR,—In a recent issue of your journal you give a report of a paper read by Mr. Popplewell Pullan on the Decoration of St. Paul's Cathedral.

Mr. Pullan expresses, at the outset, the hope "that his paper would be of interest to some members of the Institute, would excite few of them, irritate none, and be instructive to all." That the paper was instructive to all, few who have read it can, I think, question; for it revealed, apparently, a good deal that was new, —not to say novel,—to the general body of the profession. Judging, however, from the comments made by some of the speakers in the discussion which followed, it can hardly be supposed that his hope as to an absence of excitement and irritation was fulfilled. One cannot but sympathise with the author in that his "suggestion towards the solution of the problem" did not meet with that approval which, no doubt, he would have desired; but my sympathy does not go so far as to lead me to concur in the wholesale denunciation which he heaps upon the memory of "Stevens, a sculptor lately deceased." It might have occurred to the lecturer, one would have thought, that most of his auditors knew what Stevens was; and, had they not heard of his decease, might fairly have inferred that he was hardly in a position to come forward and reciprocate the kindly and generous sentiments expressed towards him by Mr. Pullan.

I do not desire to occupy your valuable space with any lengthened discussion as to the rival schemes; but, with your permission, to say a few words with regard to one of the subjects touched upon on the occasion alluded to. I refer to the Wellington Monument.

It has always appeared to me that the Wellington Monument, though in itself a work of great merit and beauty, cannot by any chance be a "joy" to any one, and certainly not "for ever," unless removed to some place where it can be properly seen. What is the impression on first catching sight (and ever after) of the monument? It is that its nature and proportions are totally unfitted for the position it occupies. The wonder is how it got there. The work is full,—perhaps a little too full,—of fine detail (which, if I may so express it, appears rather inclined to run to seed); but when walking round the monument the eye is satisfied. Supposing, though for a moment, the details had been inferior, the general outline remaining one of marked excellence, would not the structure have been so denounced as to have forced the authorities to have removed it long since? I venture to hope so; for then nothing in the shape of beauty could have been seen, a good view of the whole structure being unobtainable. I believe I am correct in saying that Stevens designed the monument to be placed between two of the nave piers. Nothing of this is said by Mr. Pullan; on the contrary, he points to the want of the sense of fitness shown in designing such a monument for such a site as evidence of Stevens's incapacity to conceive a suitable scheme for the decoration of the dome. But who, it may be asked, was the adviser of the Dean and Chapter as to placing the monument in its present position? Perhaps,—and I trust it was so,—the Surveyor to the cathedral entered a protest. Could he, however, have represented to the Dean and Chapter the grossness of the blunder they were making?

We talk, sir, very much in these æsthetic days about the value of educational influences, especially in matters of art. Is not this one of the most charming examples? What can be the impressions in the minds of the thousands of visitors to the cathedral, as you see them, guide-book in hand, craning their necks in the futile endeavour to catch a glimpse of the fine sculpture which adorns the monument?

Those who wish to know how great an artist Stevens really was would do well to pay a visit to the Architectural Court in the South Kensington Museum. That the original conception of the artist was a noble one, evincing a splendid mastery over the style, we have only to study there the original model. There, also, are to be seen the models of "Truth pulling out the Tongue of Falsehood," and "Valour spurning Cowardice."

In reply to a statement that the nodding plumes of the duke would have swept the ceiling, Mr. Stannus stated that it was not intended to have any plumes in the hat; they are not likely, therefore, to have swept the ceiling. He also says that it is 18 ft. from the platform (upon which the equestrian statue of the duke was to have stood, and at present the summit of the monument) and the ceiling. Are we to regard this as a defence of the placing of the monument? But the work is not complete; nor does it look so; and should there be surprise, the crowning feature of the structure being absent?

It would be interesting to learn, had the artist's design been carried out in its entirety, what space there would have been from the ceiling of the Consistory Court to the topmost point of the statue.

We have here a costly monument to the memory of one of our greatest men, a monument of considerable size and richness (and therefore, no doubt, to the ordinary mind, the more worthy of study), situated in a conspicuous position, near the principal entrance of our metropolitan cathedral,—a monument of unusual merit, and yet the whole affair a bungle. Where is our "lucidity"? Can we hope to advance as we should if we permit such errors to pass almost unnoticed? Errors have been so common with us in matters of this kind that we have come to regard it as a surprise to have the right thing done. Is not this another notable instance of the need of our having some tribunal to which matters of this kind might be submitted, and whose language should be law?

No doubt, if the monument be permitted to remain in its present position, it will soon be regarded as a fitting precedent for the exercise of a similar piece of good judgment elsewhere. Sir, I have seen such abominations erected that I believe the very winds of heaven would have blown them down in disgust had they not been shielded by the all-protecting mantle of precedent. Are we here to record another decision against the "reason of mankind," and call it a *precedent*?

CHARLES E. DYER.

OBITUARY.

Mr. J. M. Blashfield.—We hear with regret of the death of one of our oldest subscribers, Mr. John Marriott Blashfield, of No. 17, Great College-street, Westminster, and late of Stamford, Lincolnshire, which took place on Friday morning, the 15th inst., after a short illness, of bronchitis, followed by paralysis. The various architectural works in terra-cotta dotted about London and elsewhere, executed by him, are familiar to many, and testify to his great zeal and successful industry in the advancement of art-industry. The care and truth displayed by him in all his manufactures have admittedly been one of the causes of the present great development of terra cotta as a building material.

The Commendatore Virginio Vespignani.—At the meeting of the Royal Institute of British Architects, on Monday evening last, the Secretary announced the decease, on the 3rd inst., of the Conte Commendatore Virginio Vespignani, Architect to St. Peter's, and Honorary and Corresponding Member, of the Vatican, Rome.

SHORTCOMINGS AT NETLEY HOSPITAL.

SIR,—I had occasion to visit Netley Hospital recently, and your remarks, in your issue of the 9th inst., on the lamentable shortcomings as regards lifts for the service of the hospital, were brought home to me very forcibly. The whole place was alive with men laboriously carrying large boxes of coals up the staircases and along the corridors. The boxes were made of iron, and were furnished with two handles, and were thus able to be carried by two men, one holding each handle. Filled with coals, as they were, they seemed just as much as some of the men could manage to carry up the steep staircases. Coals were unavoidably dropped about, and, of course, a good deal of coal-dust was mixed with the air. I was told they were carrying the week's supply for all the wards of the hospital and for all the offices of the establishment, as well as for the quarters in which the sick officers and some of the medical officers resided. This coal-carrying is a regular weekly performance, and when I mention that the lines of wards open upon corridors, each over a quarter of a mile long, and that there are three tiers of them, one above another, while the central part of the building is four stories in height, you may readily conceive what the work is, and what the effect is on the sick attendants who have to do it, and on the place itself. However clean the staircases and passages may be at its commencement, they are left in a condition that, as a matter of necessity, requires scrubbing and cleaning afterwards. To any one who knows what the uses of mechanical lifts are in our great hotels and other lofty public buildings, it is quite beyond comprehension that such a state of things should be permitted to last a day in our great military hospital, with its Royal foundation and national associations. It is stated that the Queen at her recent visit remarked on the chilliness of the corridors, and no one who passes along them on a cold windy day can be at all surprised at such an observation. How some of the patients can brave with impunity the cold currents of air that sweep along them is a mystery.

A CASUAL OBSERVER.

THE STONE QUESTION.

SIR,—Mr. Cross, in his letter of December 2, tells us that it is "a marvellous thing that the stone used in London buildings perishes so quickly"; but those who have considered this subject at all know that it is not in the least degree surprising. It is simply a matter of cause and effect. It is not to be wondered at that the cementing ingredients of stone,—hard or soft,—are destroyed when the chemical constituents of the abnormal atmosphere of London are considered. Carbonate of lime cannot long exist in the perpetual presence of hydrochloric acid, carburetted hydrogen, sulphurous gas, ammonia, and other corrosive agents, which are greedily absorbed by all free-stones. And Mr. Cross's panacea of careful "selection" at the quarries would only have the effect of retarding decay, even admitting it to be practically possible to carry it out. But I may ask, what owner of any well-known quarry would permit Mr. Cross or any one else to pick out the best stone on the spot for one particular building? Then, if architects, proprietors, and

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committees are obliged, in nine cases out of ten, to study rigid economy, it is not likely they will bear the cost of the salary of a competent man to hang about the quarry decided upon,—say, for a year or two,—just "to select" their portion of stone only. The owner would necessarily have to attend to the wants of many other customers, and therefore the above competent man would spend many idle days doing nothing for his employers. With the poisoned air of London it is only a question of time how long this or that stone will resist the powerful acids,—a few only of which I have named above. Owing to various causes, some stones will last longer than others, and, in my own experience, it is not always the quality of hardness that increases durability. One of the softest stones I ever used has proved, after thirty years' exposure to country air, absolutely durable. But we are talking of London,—abnormal London,—and there is only one stone, so far as my own experience goes, that will not decay, viz., Craigleith; but as it contains 79 per cent. of silica it is so expensive to work as practically to be out of the market. Indeed, it is rather to be classed with the granites.

On the whole, then, I venture to think that Mr. Cross's proposal of "better selection" of stone at the quarry would not prove a remedy for the decay of stone in London, and is impracticable. H. T.

THE DECORATION OF ST. PAUL'S.

SIR,—Permit me to point out to Mr. R. P. Pullan that as the published reports of the meeting at the Institute contain the sentence "Having repudiated architects," exactly as quoted by Mr. Stannus, it may be possible that the latter gentleman was *not* "guilty of something more than garbling a quotation."

Referring to the rest of Mr. Pullan's letter, I would wish to express sincere regret that he should have been so sensitive to adverse criticism as to imagine that a person so well known for his geniality and fairness in discussion as Mr. Stannus is, could possibly desire to convey an unjust imputation against an opponent.

J. OSBORNE SMITH.

VARIORUM.

THE "British Almanack and Companion," 1883, holds its own, and seems to be the library almanac *par excellence*. The "Companion" has, as usual, a number of well-written essays on subjects of the day, including a section on architecture and public improvements. The writer, we are glad to see, objects entirely to the scheme determined on at Hyde Park Corner, and the removal of the arch.——The *American Bookseller*, besides giving full information as to works published and promised, includes some incisive and pregnant notes on passing events of cognate interest.

Miscellanea.

The Regent's Canal and City Railway.—The Regent's Canal, City, and Docks Railway Company, who obtained their Act last session, have commenced the purchase of lands along the line of route, with the view of immediately entering upon the construction of the line, and have just completed an important purchase in the neighbourhood of Aldersgate-street. The project includes the construction of a station in that locality, not far from the Aldersgate-street station of the Metropolitan Company, and for this and the general purposes of their undertaking, the company have just purchased a large area of land on the boundary of the City in Golden-lane. The land, which has for some time past been vacant, and which contains 45,336 ft., has been bought from the local authorities for the sum of 80,592*l.*, being at the rate of nearly 2*l.* per foot. It is stated that the purchase-money is intended to be applied to the erection of artisans' dwellings in Petticoat-square.

The Bethnal-green Museum.—The Marquis of Bute has followed the good example of Sir Richard Wallace, Mr. Franks, and other possessors of celebrated collections, and has lent the greater part of his pictures to the museum at Bethnal-green. They have been arranged in the South Gallery, which they completely fill, and the collection was opened to the public on Thursday morning.

Royal Academy.—The private view of the works of Old Masters and deceased British Artists will take place on Saturday, the 30th of December. The exhibition will be open to the public on the following Monday.

Manchester School of Art.—After twenty-one years' sojourn as a public officer in Manchester, Mr. W. J. Muckley has resigned his post as director and principal of the School of Art in this city. Up to the last eighteen months the Manchester School has never had a building of its own, and hardly any school of art in the kingdom has had to work under difficulties so great as it has done, notwithstanding its success. At the present moment Manchester may be justly proud of having the finest art school in the kingdom. The prize fund of 650*l.*, which is connected with the school in perpetuity, was solely obtained by the retiring director. Mr. Muckley now wishes to pay more continuous and immediate attention to his own work as a painter in the metropolis,—to which place we understand he is about to remove,—as well as to other matters connected with industrial art, and in which he has been very successful of late years.

Masters and Men.—The fifth annual dinner to the *employés* of Mr. J. Hill, 37, Upper Thames-street, was given on Thursday at the Holborn Restaurant, the chair being occupied by Mr. Hill, and the vice-chair by Mr. Ritchie (of Messrs. Steven Bros. & Co.). The usual toasts were given, and in reply to that of "The Chairman," Mr. Hill gave an interesting sketch of a three months' tour which he and his wife made this year in the East; passing in review his impressions of Italy, Greece, Palestine, and Egypt, his remarks on Egypt being all the more interesting from the fact that he had been in Alexandria and Cairo shortly before the war broke out. In the course of the evening Mr. Hill's manager, Mr. King, was presented by his fellow *employés* with a silver biscuit-box, as a mark of their esteem and in commemoration of his recent return from a tour of inspection of the leading lock manufactories of the United States.

New Shoreham, Sussex.—This once important port is now showing signs of returning life, and is likely to make its title of being the "Liverpool of the South" a reality, applications from several eminent manufacturing firms in the Northern and Midland Counties, London, and Germany being on foot for information as to land or buildings available with easy railway and port access. And as rents are at present low, and the prospects of another railway to Brighton, in competition with the London, Brighton, and South Coast Railway, are in active promotion, the busy hum of commerce is likely soon to be heard there. The Local Board, anxious to see brighter things, have already approved plans prepared by Mr. Arthur Loader, architect, of Brighton and Shoreham, for extensive buildings for the manufacture of soap, which, if carried out at a cost of 6,000*l.*, will employ a considerable number of workmen.

The New City of London School.—Reverting to the particulars given by us last week of this building, we find that the whole of the stone carving to the interior, and the greater portion of the foliated carving to the exterior, were executed by Mr. J. W. Seale, of the "Apollo" Works, Walworth, and not by Mr. G. W. Seale, of Brixton, as formerly stated. We may also mention that the parquet floors and the marble mosaic pavements in the entrance-hall and elsewhere were laid by Mr. Ebner, of Clerkenwell-road; and that "Lincrusta-Walton," supplied by Messrs. Fredk. Walton & Co., Limited, was used in the head-master's room, the secretary's room, and also in the library.

Social.—Mr. W. W. Gwyther, F.R.I.B.A., was on Monday evening last entertained at dinner at the Café Royal, Regent-street, by his assistants and pupils, past and present. Mr. J. W. Stevens occupied the chair, and proposed the toast of the evening; and Mr. C. J. Jones, as senior assistant, presented to Mr. Gwyther a handsomely-bound morocco album, mounted in silver gilt, with arms, monogram, &c., thereon.

Damp Walls.—Those who are inflicted with the nuisance of damp walls might find it worth while to make use of the "Crown Damp-Resisting Fluids," manufactured by T. F. Chambers & Co., of Hull, and which are getting into use for the suppression of damp. The Midland and other railway companies, we are told, are using them largely.

Monumental.—On Saturday, the 23rd inst., at three p.m., Messrs. H. Young & Co., Pimlico, purpose casting in bronze the statue of the late Earl of Beaconsfield, K.G. (by Mario Raggi, sculptor).

Pumping Machinery.—We notice that at the Cornwall Mining Institute Exhibition, held last week at Camborne, the well-known firm of John Warner & Sons, of the Crescent Foundry, Cripplegate, were awarded a silver medal for their exhibit of mine pumping machinery and pumps, and mining tools.

TENDERS

For the erection of infants' school, for the Carshalton School Board. Mr. J. D. Hayton, architect, Whitehall. Quantities by Mr. C. H. Gough:—

Hersee	£1,876 0 0
Backey & Smith	1,620 0 0
Pritchard	1,500 0 0
Morley	1,417 0 0
Burridge	1,367 0 0
Clark	1,361 0 0
Rowe	1,347 0 0
Beale	1,320 0 0
Pickersgill Bros.	1,315 0 0
Smith & Bulteel	1,298 0 0
Abraham	1,296 0 0
Howe & White	1,296 0 0
Jarvis	1,293 0 0
J. & C. Bowyer	1,290 0 0
Burnam	1,276 10 0
Bracey	1,275 0 0
Arney	1,275 0 0
Lorden & Son	1,266 0 0
Winter	1,253 0 0
Willcock	1,239 0 0
Le Gassick & Co.	1,215 0 0
J. W. Hobbs	1,199 0 0
Sharpe	1,198 0 0
Holloway	1,193 0 0
Wagner	1,186 0 0
Buchan	1,170 0 0
Coles	1,157 0 0
Deacon	1,145 0 0
Morris	1,143 0 0
Docking	1,139 0 0
Knight	1,133 15 0
Brown Bros.	1,127 0 0
Scharien & Co.	1,120 0 0
Wontner Smith	1,118 0 0
Higgs	1,098 0 0
Stewart	1,098 0 0
Ward	1,098 0 0
Humphris	1,085 0 0
Cawson & Sons	1,073 0 0
Dawson & Sons	1,055 0 0
Priestley & Gurney	1,025 0 0
Potter	1,025 0 0
Evans	1,017 0 0
Keate	996 0 0
Pearson	986 0 0
Ackerman	935 9 11

For the erection of new greenhouse and vinery, at Castleford, Yorkshire. Messrs. Wm. Lewis & Son, architects, 46½, Stonegate, York. Quantities by the architects:—

T. B. Wilson, Castleford	£160 0 0

For the erection and completion of cemetery chapels, entrance-lodge, boundary-walls, and laying-out the grounds, at Cawood, near Selby, Yorkshire, for the Selby Union Rural Sanitary Authority. Messrs. Wm. Lewis & Son, architects. Quantities by the architects:—

T. Hinsley, Selby	£2,000 0 0

For the erection of cottages and stables, at Castleford, Yorkshire. Messrs. Wm. Lewis & Son, architects. Quantities by the architects:—

J. Spears, Castleford (Lowest estimate of twenty.)	£1,600 0 0

For the erection of new drying-kilns, at Castleford, Yorkshire. Messrs. Wm. Lewis & Son, architects. Quantities by the architects:—

J. Spears, Castleford (Lowest estimate of fifteen.)	£600 0 0

For proposed new shoe manufactory, at Kettering, Northamptonshire, for Messrs. Farey. Mr. Thomas Whitney, architect. Quantities supplied:—

Roberts & Sons, Stratford-on-Avon	£1,800 0 0
Bennett, Rugby	1,775 0 0
Wingrove, Northampton	1,621 0 0
Law, Northampton	1,556 0 0
Waring, Northampton	1,549 0 0
Daniel Ireson, Northampton	1,506 0 0
Ginns, Kettering	1,494 0 0
H. J. Henson, Kettering	1,483 0 0
Sharman, Kettering	1,460 0 0
G. Henson, Kettering	1,394 0 0
Coltman, Kettering	1,359 0 0
Barlow, Rothwell	1,337 0 0
Manby, Kettering	1,335 0 0
Briggs, Kettering	1,325 0 0
C. & F. Henson, Kettering	1,321 0 0
Margetts, Kettering	1,296 0 0
Payne & Son, Kettering	1,248 0 0

For the erection of four houses at Woodford, Northamptonshire, for Mr. Zachariah Gunn. Mr. Thomas Whitney, architect. Quantities supplied:—

Ireson	£676 0 0
Johnson & March	670 0 0
Coates & Son	640 0 0
Lovell & Adams	633 0 0
Sharman	620 0 0
Margetts	573 0 0
Payne & Son	565 0 0
Halford	564 0 0
Waring	520 0 0
Henson	520 0 0
Tarrant	490 0 0

For proposed additions to the Montpellier Tavern, Montpellier-street, Walworth, for Mr. Tanner. Messrs. Muggeridge & Powell, architects:—

Fisher	£439 0 0
Castle	425 0 0
Taylor	420 0 0
Burman	397 0 0
Tyreman	376 0 0
B. Cook	373 0 0

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For proposed new church for the Committee of the Reformed Episcopal Church, Hemel Hempstead. Messrs. Coe & Robinson, architects :—

Young & Co.	£3,133	0	0
Ireson	3,045	0	0
Howe	2,640	0	0
Cook Bros.	2,616	0	0
Monk	2,287	0	0
Honour & Sons	2,279	0	0
Sears	2,089	0	0

For new farm buildings, at the Sewerage Farm, for the Corporation of Northampton :—

Waring, Northampton	£389	0	0
Ireson, Northampton	350	0	0
Dunkley, Pike-lane	340	0	0
Clayson & Sharman, Brayfield	317	0	0
Wingrove, Northampton	296	0	0
G. White, Northampton	239	0	0

For alteration at Police-station, Fish-street, Northampton, for the Corporation of Northampton :—

Ireson, Northampton	£148	15	0
G. White, Northampton	123	10	0

For alterations and additions to No. 147, Gloucester-road, for Mr. E. Wrigleworth. Mr. George Edwards, architect. Quantities by Mr. H. Lovegrove :—

Aldin & Plater	£1,799	0	0
Martin Wells & Co.	1,780	0	0
Craske	1,698	0	0
Dyer	1,679	0	0
Toten & Sons	1,665	0	0
King & Son	1,655	0	0
Scrivener & Co.	1,650	0	0
Pain	1,646	0	0
Stimpson & Co.	1,520	0	0
Lucas & Son	1,445	0	0
Shareen & Williams	1,444	0	0
Green	1,430	0	0

For new roads, sewers, brick culvert, and surface water-drains, &c., for the British Land Company, Limited, on their estate at Ealing Park, Middlesex. Mr. Henry B. Michell, surveyor :—

McKenzie & Williams, London	£7,123	0	0
Bloomfield, Tottenham	7,101	0	0
Crockett, St. Pancras	7,032	0	0
Nowell & Robson, Kensington	6,975	0	0
J. Jackson, Leyton	6,943	0	0
Pizzey, Hornsey	6,920	0	0
Dunmore, Hornsey	6,205	0	0
Harris, Camberwell	6,115	0	0
Keeble, Regent's Park	5,804	0	0
Wilson, Walthamstow	5,498	0	0
Peill & Sons, Bromley, Kent*	5,325	0	0

* Accepted.

For three houses in Cliff-road, Dovercourt. Messrs. Whitmore & Reeves, architects, Chelmsford and London. Quantities supplied :—

H. Gozzett, Woodham Walter	£2,450	0	0
J. Grimes, Colchester	2,380	0	0
J. W. C. Butcher, Harwich	2,370	0	0
S. J. Newton, Harwich	2,340	0	0
R. Girling, Ipswich	2,263	0	0
F. Dupont, Colchester	2,219	0	0
R. S. Smith, Ipswich	2,198	0	0
G. Dobson, Colchester	2,175	0	0
W. Wood, Chelmsford	2,120	0	0
H. Everett & Son, Colchester	2,100	0	0
N. Saunders & Son, Dedham	1,934	0	0
H. Wright, London	1,542	10	0

For reinstating, after fire, cigar and tobacco factory, Half-moon-passage, Whitechapel, for Messrs. B. Morris & Son. Mr. J. Hudson, architect :—

Read & Son	£2,373	0	0 !
Little	2,239	0	0
Earle & Son	1,482	0	0
Gould & Brand	1,459	0	0
Cox	1,455	0	0
Roberts (accepted)	1,259	0	0
Barnett	1,170	0	0 !

For rebuilding No. 207, Pentonville-road, for Mr. H. Houfe. Mr. D. North, architect :—

Batchelor	£1,156	0	0
Gould & Brand	1,097	0	0
Burman	1,077	0	0
Langmead & Way	1,025	0	0
Anley	1,014	0	0
Hayworth	1,011	0	0

For internal plumbing and hot-water work to new house, Caterham, for Mr. D. Birt. Mr. J. Sulman, architect :—
J. Knight, Westminster (accepted).

For alterations and additions to the Wallace Head, Blandford-street. Mr. Applin, architect :—

Langmead & Way	£760	0	0
Godden	709	0	0
B. T. Wood	705	0	0
W. Shurmur	669	0	0
J. Harper	663	0	0

For alterations and office-fittings, at No. 20, King-street, E.C., for the Cheque Bank, Limited. Mr. Chas. Poland, architect :—
W. Shurmur (accepted).

For alterations, &c., at the Russell Arms, Bedford-street, Seymour-street. Mr. J. R. Furniss, architect :—

Jackson & Todd	£274	0	0
King	246	10	0
Toms	239	0	0
Anley	215	10	0
Lamble (accepted)	209	0	0

Accepted for St. Michael's Church, Ford, Cornhill-on-Tweed, for Rev. H. M. Neville, M.A. Mr. Walter B. Thomas, architect, Ford. Quantities by the architect :—
Henry Aynsley (*Concrete*).
Locke & Brown (*Masonry*).
R. & J. Steel (*Carpenter and Joiners' Work*).

For new shop-front and shop-fittings, at No. 180, High-street, Camden-town, for Mr. Slade :—
Gould & Brand (accepted).

For shop-fittings at No. 3, Prospect-place, Edgware-road, for Messrs. E. & C. Mathews :—
Gould & Brand (accepted).

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The Builder.

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New Forms of Old Materials of Industrial Art.

REMARKABLE feature of that application of science to enlarge the resources of industry which characterises the activity of the present phase of manufacturing development is the application of substances so newly discovered, or so remarkably transformed, by the skill of the chemist, as to assume the aspect almost of new creations. It is now a considerable time since the discovery of the phenomena of allotropism taught us that there were more secrets in chemistry than could be explained by the scales, the blow-pipe, and the test-tube. The most remarkable, at all events for its magnitude, of these new developments of industrial science has been the mode in which steel can now be produced at far less than the cost of iron forty years ago, by the process invented by Bessemer. Steel, under his influence, has become almost as new a material for our industry as if a wholly new ore had been discovered and brought into use, and, in the great majority of cases, is driving iron entirely out of the field. Hand-in-hand with the discoveries of what we may call the industrial chemist have marched those of the scientific analyst. The reduction of the rarer and more perishable metals from their earths, as in the case of sodium, potassium, and their neighbours, has been accompanied by the discovery of other metals so absolutely new to chemistry as to take the names of, or those imposed by, their discoverers. And now we hear how the means have been perfected of reducing one metal which, half a century ago, may almost be said to have had only a theoretic or potential existence, not only into workable form, but into marketable condition. Among the most abundant mineral substances which form the crust of our globe in its common form of earth, aluminium has been for some time known to possess qualities of extreme value, as, for example, lightness almost unrivalled among metals, and as little disposition to oxidise as gold itself. The barrier to the introduction of aluminium into industrial art has been the great cost of its reduction from alumina; and its chief use, so far as we are aware, hitherto, has been for optical instruments, in which the advantage derived from the combination of strength and lightness that it afforded was enough to enable the optician to overcome the disadvantage of its cost.

A new process, we now hear, has been lately perfected, by which aluminium may be produced at about the price of copper,—that is to say, at 100*l.*, instead of at the present cost of 1,000*l.*, per ton. Should this prove to be correct, the effect of the discovery is not easy to anticipate. To the architect one of the first suggestions will be that it will provide a material for roofing which shall possess all the great superiority of lead over cheaper materials, while avoiding both the great weight and the comparatively perishable character of that time-honoured roofing metal. If cost permit, and if durability be assured, the advantages of large sheets of well-joined metal, of very low specific gravity, over the heavy and clumsy structure of tiles and of slates, the numerous joints of which often admit wind or rain, and hardly ever wholly exclude drifting snow, will be very soon appreciated by the householder.

Another comparatively new invention,—perhaps we should rather speak of it as quantitative than as a qualitative discovery,—is that of asbestos. Asbestos, indeed, has long been known, and its indestructible nature has pointed it out as an invaluable material for not a few purposes. But, unless we are much misinformed, the industrial use of asbestos is about to receive a very remarkable development. A mountain or rock of pure asbestos has been discovered in the United States, and purchased by an English proprietor. Hydraulic machinery has been provided for the crushing of this rock between rollers; but the result of the crushing process is not dust or grit, but natural fibres, such being the intimate structure of the rock itself. These imperishable mineral fibres are treated much like the fibres of animal or vegetable origin, wool, silk, and cotton. They are spun into cords, they are woven into cloths, and, in fact, assume the position of a new textile material. Already we are told that curtains of asbestos cloth are provided, or are in course of provision, for theatres. The utility of such a screen, if dropped between the stage and the auditorium, in case of any alarm from fire is obvious, being, in fact, equal in exclusive power to an iron screen or blind, without the ponderous and unmanageable weight of the latter.

Again, regarded from the *Builder's* point of view, sash-lines that can neither rot, fray, nor perish in any other manner, form a desideratum of which we have little doubt that the trade will largely avail themselves. The not inconsiderable number of accidents, and the very great amount of inconvenience and of cost, arising from broken sash-lines, may thus be removed from our host of petty troubles. Most unexpected to ourselves,—while far from being of the most trifling importance,—is the use of asbestos, in the form of a kind of mineral tow, for the packing the glands of steam engines; a service in which the material is said to show itself both convenient and imperishable.

That side by side with, or following in close sequence after, these two new gifts to industry, are many more inventions in a more or less ripe state of advance, we can hardly doubt. With each new material, new forms will insensibly make their appearance; and there is thus good reason to anticipate that the influence of the change may extend itself to the elevations of the architect, as well as to the structural outlines of the engineer. Our planet is a world of change, but the changes in its physical condition, in so far as they are effected by man, that have already taken place within our own century are probably greater in amount than the sum of those contained in the whole range of antecedent history. And of these changes the cases of steel, of aluminium, and of asbestos appear to us to prove that we now witness only the commencement.

By a coincidence which is almost startling in its aptness, the foregoing lines were written (at a distance of some 150 miles from London) at, or very shortly before, the hour when the outburst of that destructive element as to which we have so often to bewail the want of ready means of extinction swept before it the Alhambra Theatre, as commented upon in our number of the 9th inst. (p. 761). The usual lamentations, the usual wonder, the usual want of any practical lesson taught by the fierce destruction, were resounding over England the next morning. Is it always to be thus? Are we always to give testimony that we are descendants of a people who might have been appropriately reigned over by Ethelred the Unready? or, at least, into whose habits unreadiness enters as a main and dominant element? In the present case there were, we are told, a fireman on the premises. Of what use a fireman was supposed to be on the premises if he were not also a watchman,—that is to say, a man properly paid for wakefulness and activity when others sleep, which is the time when long-smouldering combustion usually bursts into flame,—we are at a loss to understand. It was possibly one of those compromises between the two antagonistic prudences,—the prudence of the pocket and the prudence of keeping up appearances, or at least descriptions, to the public, from which misfortune is pretty sure to result. Visitors might feel reassured at being told there is a fireman on the premises. But if they are not told at the same time "And he is on the watch, or in some way engaged by day, and has to rest, like the remainder of us, by night," the announcement of the presence of such an officer is hardly of that definite nature which perfect candour would demand. So it is, however, and so it always is. It is just the one little thing that is unexpectedly out of order that is usually the cause of all destructive fires. Crystal

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Palace, Alexandra Palace, Ring Theatre: how many more conflagrations can we recall that were only just not prevented?

The remarks that we just made on asbestos thus assume a new importance. True, this was not a case in which an asbestos curtain, or an iron shutter, or any thing but a curtain of water (such as may be witnessed in the quaint old Palace of Cintra), would have saved the building. But does it not seem that we have in this fierce fire but one more of those stern lessons which ought to teach us that buildings where many human beings are in the habit of congregating, under circumstances which would render an alarm of fire as fatal as an outbreak of fire, ought to be composed of incombustible material?

We are not about, at this moment, to express any opinion as to the value of this or the other process for rendering wood incombustible. It is enough to say that there are processes known to science which profess to attain this end, and further, that if they do not actually attain it, it is high time that better means of preservation should be invented. One way or another, we will not allow ourselves to doubt, wood can be rendered incombustible by the chemist, and when to this consideration we add that which ensues from our preceding remarks, to wit, that drapery of all kinds can be so produced as to be not only non-inflammable, or non-combustible, but absolutely indestructible by fire, what excuse is there for future catastrophes in church or theatre, stately mansion or rich museum? Our readers may remember,—alas! it is many years since,—the start that was given to fireproof warehouses. The plan, if we remember rightly, was protected by a patent. The form in which it is most familiar to our memory is that of a building enclosed with stone or brick walls, in which the floors were supported by cast-iron columns, and consisted of cast-iron girders, with brick arches in cement, turned between them. Cold and stern these buildings looked, no doubt, but the stranger who entered them when nearly finished would be apt to say, "At least, they are incombustible." So, no doubt, they were. But incombustibility,—that is to say unfitness to become supporters of combustion,—is a very different thing from indestructibility by fire. And thus when, under the supposed protection of incombustible roofs and floors, great warehouses were filled with oil, tallow, petroleum, wood, or other combustible materials, it was not the building, but its contents, that burned, on the fall of a careless spark. The building acted as a kiln. And under a fierce heat cast-iron cracks, especially if water is thrown on it; stone cracks; bricks crumble, and the destruction of the kiln itself completes that of its contents. And thus, not without some reason, the name of a fireproof building has fallen quite deservedly into disrepute.

Far different is the case in a theatre or a church. There the only combustible materials, except such as form part of the structure, are the clothes,—we might almost say the persons,—of the frequenters. In these there lurks no danger of spontaneous combustion, of ready catching fire from a spark, or of any of those numerous and often mysterious causes that lead to the inflammation of inflammable stores. Here the source of danger, then, lies in the building itself, and more especially in the linings and decorations. A theatre or church built of stone, brick, and iron, in which, if wood is introduced, it is in the form of those masses which, whether vertical or horizontal, are less destructible by fire than hollow cast-iron columns or delicately-calculated girders, will be, in itself, indestructible, provided that lining, fittings, seats, curtains, and decorations, are made of indestructible materials. Without, at this moment, assuming the responsibility of sponsors for *Carton Pierre*, we may mention that as a decorative material which at least claims to be uninflammable. Of lithicised wood, or by whatever name the precautionary treatment of wood may be called, we have just spoken. Here comes in asbestos to complete all that is needful for decoration. Is there any danger of destructive fire breaking out in a theatre or church laid down on these lines? And, if not, is it too much to demand that legislative sanction should be appealed to, and that the building, the fitting up, and the frequentation of buildings that now too frequently act as fire-traps, panic-traps, and death-traps, should be sternly and completely prohibited? What is the good of Building Acts, and inspectors, and the whole machinery in which we put our trust, if it do not, in the first place, grapple with the question,—"Shall buildings, that may prove the source of such frightful catastrophes, be suffered to rear their roofs in what calls itself a civilised country?"

We spoke a few paragraphs back of coincidence. Little did we think, while writing these words, that at the very moment thirty fire-engines were playing on the scene of the most terrific fire that has for a long time been witnessed in London,—a fire which at one time seemed as if it were the commencement of a sweeping destruction like that of the Great Fire of 1666. The description of the scene as given by an eye-witness in the columns of the *Morning Post*, is at once graphic and awe-striking, to the verge of sublimity. The fire seems wholly to have obtained the mastery,—so much so, indeed, that the quantity of water poured on the blazing mass from the engines seemed to have no effect on the flames. The case was precisely one of the kind in which the buildings acted as kilns, ministering a draught to the blazing materials within them, until kiln and contents were overwhelmed in a common destruction. How or why the fire was ultimately got under seems as yet unexplained, but that the utmost gratitude is due to the firemen there is no reason to doubt. One large brick building, unconnected structurally with the burning mass, was attacked by radiant heat and flying sparks, and, in spite of a good supply of water, finally succumbed to the attack from without. A case of this kind, which we take to be rare, if not almost without precedent, shows how tremendous was the heat of the combustion, and how vain are our best appliances, steam-pumps, fire brigades, and what not, to oppose the destructive element when once it has attained a certain fury. Had the wind been high and steady we apprehend that nothing but an extensive demolition of neighbouring buildings by gunpowder could have arrested the devouring progress of the flames.

"The extremely combustible nature of the stock which filled both warehouses," says the eye-witness before referred to, "supplied enough fuel to keep the interior in one tremendous blaze." The fire "furnished a spectacle such as few people are likely to see twice. No words can adequately describe its terrific grandeur. . . . . The eye saw nothing but an enormous sheet of flame swallowing up everything as it rose in mighty volume to the sky. The windows of the basement were furnished with iron bars, through which an artificially-created draught rushed and roared, just as it does through the furnace of a foundry, or of a great steam ship. The idea most forcibly conveyed to the mind by this sight was that of irresistible power. The copious streams of water incessantly poured on to the front of the building did not produce even the slight effect of darkening its glowing surface."

The above description suggests, among other things, the mischief of the prevailing plan of dispensing with shutters. Not in London alone, but in many of our provincial towns, the time-honoured appliance of the shop-shutter is replaced by plate-glass windows protected by iron bars,—and not unfrequently the gas is left burning all night. How far this may be a protection against burglars may be in doubt. But that in any case of fire the substitution of a glass for a solid wood or iron shield is enough to supply at the critical moment the very draught that turns a casualty into a calamity, we think there cannot be a moment's doubt. As to the police part of the story it is for others to decide. For ourselves, we cannot but see, in these naked temptations to the nightly prowler, an outcome of that miserable spirit of skimping economy which has rendered window-shutters obsolete in our bedrooms. A miserable economy involving great loss, first of warmth,—then of quiet and of sleep. To say that in a closely shuttered apartment nine people out of ten will enjoy more peaceful and unbroken slumber than in the cold and naked room, with, maybe, a Venetian blind, maybe an ordinary linen blind, and perhaps a curtain of some sort behind that, to shut out the cold of night, and the awakening beams of the morning sun, is to say little enough. The value of such a protection to the repose of the brain was adequately regarded by the great Napoleon, whose first care, on entering on any new quarters during his campaigns, was that his bedroom should be so situated or so provided as to be inaccessible to external light, except by desire.

We opine that, as people are always ready to find an excuse for stinginess, it is nothing but the desire of saving that has first banished the bedroom window-shutters, and then replaced the shop-shutters by a contrivance which, in any fire, acts immediately as the flue to a furnace, and we suggest for consideration the propriety of forbidding this kind of encouragement to calamity.

As to the effect of lofty buildings and of buildings of large internal area, unbroken by solid partitions, in increasing an ordinary fire to a terrible conflagration, we think there can be little doubt. We are apt to think that we have made great advances on the small thatched houses of our ancestors. We can well remember, now many years ago, a fire in a Devonshire town, where the houses were thatched, and where the flames crept from roof to roof; but with this facility for the spread of flames there was connected no irresistible march of a great volume of fire, such as that witnessed at Wood-street. The fire more easily spread, but it was also more easily extinguished. Two or three hand-pumps were enough to ensure safety. But with increased command over building materials has come increased size of building. It is impossible to tell what will be the thorough outcome of any great architectural change until it has been thoroughly tested. But a test has been now applied by fire. The stores of a fancy stationer, for such we take the account to indicate,—are, no doubt, combustible enough. But they are by no means so inflammable or so inflammatory as those to which we before referred, tallow and combustible oils. It is matter for consideration whether there should not be some limit fixed, as in the case of gunpowder, to the storing in a town of materials of this nature, and further, whether there should not be a limit imposed as to the size of buildings which, in an urban locality, are used as store-houses or warehouses, determinable with reference to the nature of the articles collected in masses.

One thing is certain. We have of late made great strides in our power of extinguishing fires. Water supply is very generally abundant, and has sufficient pressure very often to throw a good jet at once from a hydrant on to the roof of the neighbouring buildings. Steam fire-engines are made of great power and great handiness. Warnings are given by telegraph. Of our firemen, we have no hesitation in saying that they form the noblest and finest army that the world has ever seen,—an army exposed to little, if any, less danger than the troops of the line, an army that knows no time of peace, no furlough of absolute rest, an army that contends, not in mortal struggle with their fellow men, but in mortal struggle with that terrible element which is either the most obedient and useful slave, or the most ferocious and unsparing tyrant of mankind. But with all these great advances, fires are far more terrible, far more destructive than they were before this great army was organised. Why is this? The architect can answer the question. But it is of little use to answer it, unless it be with the view of adopting measures to prevent the accumulation in cities and towns of combustible materials in such places and in such quarters that, if they do catch fire, the fire is pretty sure to become irresistible.

A NEW LIFE OF RAFFAELLE.

The earnest and hardworking students of Italian art-history, to whom we owe the general "History of Painting in North Italy," and the admirable Life of Titian, Messrs. Crowe and Cavalcaselle, have now turned their attention to the task of tracing out, more completely and exhaustively than has yet been done, the facts of the life of Raphael (we adopt their mode of spelling).* One volume only is as yet before us, for biography produced in the spirit in which Messrs. Crowe and Cavalcaselle work is not produced in a day. The scope of this volume, and the manner in which it has been produced, may be stated in the words of the authors in their preface. "They hope to have done something to shed a new light on Raphael's career. In the volume which they now offer to the public, they have shown how they ventured to explore and attempted to illustrate the

* Raphael: his Life and Works; with particular Reference to newly-discovered Records, and an exhaustive Study of extant Drawings and Pictures. By J. A. Crowe and G. B. Cavalcaselle. Vol. I. London: John Murray, 1882.

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Period of Raphael's youth, which had hitherto been comparatively neglected. They have tried to prove how he was taught under his father and Perugino; and they have looked at every drawing as well as at every picture to trace the road which led him deviously to fame; they point out, it may be not unerringly, where he copied the antique, where his professional rivals or precursors; how he digested and assimilated after learning the lessons of all the masters of his country. Little or nothing, indeed, has been added to the documentary evidence which has been stored since the days of Vasari, but all the materials in existence have been used, and neither time nor travel has been spared to study personally every example, in whatever part of the world it was deposited."

The present volume only extends, therefore, as far as Raphael's removal to Rome about the age of twenty-four. But one of the most interesting portions of the book is that in which the authors endeavour to throw more light on Raphael's boyhood and the period of learning his art. Though no name is so widely known in connexion with painting as that of Raphael, no reputation so wide-spread and so universally admitted and reverenced, we have for the most part little conception in our minds as to how Raphael grew up and developed his genius. We are most of us in the habit of looking on him as an accomplished fact among great painters; we think of him as the author of the Stanze and the Cartoons and the Transfiguration, without troubling ourselves much to go back in mind to the antecedents of this remarkably complete and perfect artist and inquire whence came he, whence he obtained his almost unequalled power of invention and expression in figures, what was his childhood, and in what light he was known among his contemporaries in the boyish period, before his genius was matured and his fame acquired. That he was a native of a country village who ended his days as the central figure of the artistic world in Rome, or at least holding a place disputed by Michelangelo alone, is the familiar aspect of his life; and of the years between his infancy and maturity, and the manner in which they were passed, we shall never now know very much. But in proportion to the meagre materials for knowledge is the necessity of amassing and making the most of these before they are yet further disintegrated by the action of time.

The first popular idea which the authors find reason to combat or to question is that Raphael was formally and from the first the pupil of Perugino. Raphael's father died when the boy was eleven; the terms of Giovanni Santi's will, in which Raphael Santi was left heir, under the guardianship of his uncle, "tend to prove that Raphael was at Urbino at the time of his father's death," and he had probably begun to learn drawing and painting, as children in the present day would begin to learn to read and write, at a much earlier age than this. "It was not to be expected that he should progress much beyond the simplest elements during the short space of time that elapsed from his first initiation to the death of Santi. But in that short span he received impressions which many years failed to obliterate, and it is curious to observe that as late as the opening of the sixteenth century" (when he was seventeen years of age) "his memory was still stored with typical forms inherited from his father." In his childhood he was "in daily contact with the tools of the painter. He watched the labours of Giovanni at his easel, and saw him send forth to admiring patrons those quaint but characteristic Umbrian altar-pieces in which he depicted the majesty of the Virgin and Child, and the admiration of attendant saints, or the meditative devotion of lay and church men at the Virgin's feet." There seems to have been another and even closer hereditary affinity between the art of father and son; for it would seem, from what the authors tell us, that we are to accept it as a fact that Santi actually made the infant Raphael and his mother the subject of a study executed on the wall of his house, just as Raphael himself studied his Madonnas from the simple nature of a mother and child, such as he might find in his daily walks and persuade within his doors, if necessary, as the model to be subsequently elevated and refined into the divine mother and child.

In questioning the idea of an early apprenticeship to Perugino, and suggesting that Raphael had no other teacher than his father during the lifetime of the latter, the authors, however, do not by any means question the generally-received idea in regard to Raphael's close relation to Perugino, and the influence of the elder painter upon his style, after the death of Giovanni Santi. Perugino, say the authors, had evidently a domicile both at Perugia and at Florence. The history of Raphael's youth between 1494 (the year of his father's death) and 1504 is a blank, which, however, our authors suggest may be filled by circumstantial evidence, and this evidence, the main heads of which are given, leads to the supposition that Perugino, even after the commencement of his labours and his partial residence at Florence, was also much at Perugia, and resided there for tolerably long periods at intervals; so that the regular tuition of Raphael under him was quite possible without the supposition of Raphael having gone to Florence at that time. Concerning the evidence of style in regard to the artistic relation of the two painters, the words of Messrs. Crowe and Cavalcaselle are worth quoting:—

"No pursuit of more absorbing interest can be found than that of following what may be called the trail of a great artist, when, knowing that he passed that way, we still remain uncertain as to the age or direction of the track. At one time the trail looks broad and worn, at other times it becomes a mere scent or vanishes altogether. In Raphael's case, as in that of Masaccio or Palmezzano, a great source of difficulty lies in the frequent diversions caused by deceptive cross scents. Perugino is so like Raphael at one place that we almost doubt the evidence of our senses. Masaccio is so like Masolino that we are lost in a maze of uncertainty. The skill of an expert would be required to tell where Melozzo ends and Palmezzano begins. But though Raphael and Perugino may at one time blend their forms to confound us, there is a time when each of them has his own prominent distinctness. They both ascend in the orbits which nature has created for them. Those orbits cross, and at the point of contact their bodies seem lost in each other. But when they emerge, a curious phenomenon appears. Not only is Raphael Peruginesque, but Perugino is Raphaelesque. The work which Perugino accomplishes from 1499 to 1504 is indelibly stamped with the impress of Raphael's genius. That of Raphael from 1502 to 1504 is equally influenced by Perugino's example. Both reveal a constant interchange of thought. If, however, Raphael was a master practising on his own account in 1502, how did he rise to the eminence from which he already looked down on his contemporaries? If Perugino was Raphaelesque in 1500, how long had he been under this new spell? We can trace Perugino's career from Perugia to Rome and Florence, and observe how steadily, but how gradually, he was influenced by Tuscan example. After 1496 a new element contributes to the manifestation of a change. Raphael's course is that of a retentive and conservative mind, always intent on steady and unbroken progress, ever acquiring, inwardly digesting, and assimilating. Is it possible that his nature before 1502 should have been in contrast with his nature afterwards? Is it not clear that he enjoyed under Perugino a long and uninterrupted course of artistic tending, and that he rose to the station which he occupied in 1502 by measured steps?"

That Raphael, coming as a junior assistant to Perugino, if not as a pupil, should nevertheless have had power enough to influence and, to some extent, transform the style of the older artist, transferring into it his own delicacy of taste and sentiment, is not in itself improbable when we consider how Raphael had contrived to fill all the world with his art before his early death at the age of thirty-seven. Raphael's fame, indeed, and the work he accomplished, form a phenomenon which is quite astounding when we remember the brevity of his life and the youthful period at which his work in earnest had begun. As one of the examples of work by Perugino in the spirit of Raphael, the authors mention the Madonna from Pavia in the National Gallery. "Here, again, are the lakes, the hills, the sparse-leaved trees, and the serene sky; here, too, the Raphaelesque combination of beautiful grouping with youth and strength and delicacy of line, of dreamy depth and brilliant light, and soft luscious colour. In the landscape is a stillness so profound that one listens for the hymn of the seraphs to come down from the sky. The whole picture is so redolent of Raphael, that his name rises involuntarily to our lips, and yet we are still far away from the time when Raphael could have shown such mastery." The conclusion is, that the youthful spirit and new feeling of the pupil had inspired the technically more accomplished master. It is a charming idea, so much so that we dwell upon it, and like to think it true, even if we hardly accept it as certain or proven. Perhaps a little of the sentiment of the description is from the feeling of the writers rather than from what was actually intended in the picture. The "stillness" in the landscape may be rather the result of inability to treat landscape in a more moving and lifelike manner, than of a set purpose of the artist resulting from an inner feeling as to the poetic suitability of such a quiescent treatment. We think this is a probable though a less interesting explanation. But the idea that Perugino, while teaching Raphael technicalities, was dipped into a *fons juventutis* under the influence of his pupil's genius, is a both pleasing and probable idea of their mutual action upon one another.

It is noted as not uninteresting that Perugia stands on high ground whence, at a distance of twenty miles, Florence can be discerned, and young Raphael would have before him the distant sight of the city which was the centre of the greatest Italian painting that had been or was to be. The next step which the authors trace in the history of Raphael's studies is in the fact,—revealed, or at least rendered very probable, by a certain sketch-book preserved at Venice,—that Raphael copied carefully the designs of other painters of the period, including Signorelli and Mantegna. It is suggested that Perugino, who knew every town between Venice and Rome, had great opportunities of collecting drawings, and that his store of collections would not unnaturally be open for the study of his pupils or assistants, who would even be recommended to make copies from them. In the fact of Raphael thus closely studying the works of other painters we have a parallel to the line of study of Mozart, the creative artist who in another line may be most likened to Raphael, who stated in one of his letters that there was not a contemporary composer of any note whose work he had not closely studied; and in Raphael's case, as in his, the result of this eclectic study of other artists of varied manners and styles seems to have been the formation of a style of his own in which all the best qualities of his models were extracted, and assimilated into his own style.

The second chapter goes through a number of miscellaneous works in various places, some of which are known to be, some believed by the authors to be, examples of Raphael's work at this period. The chapter is evidently the result of laborious and careful research, and we must refer the reader to it for further information. In Chapter III. the same history is continued, and among other things the suggestion is made of the co-operation of Raphael with Pinturicchio and Perugino in the painting executed by those artists at Sienna in 1502; and the notes on various sketches by Raphael for the subject of the flight into Egypt, and the alterations which took place in his arrangement of the composition, are of great interest, as is, indeed, the whole of this chapter, which traces step by step some of the stages of Raphael's art from known examples, and attempts to show the various influences, from nature and from contemporary artists, which were more or less affecting his style, though never over-riding his own genius and individuality. The chapter is so full of matter, however, that to give any synopsis which would convey an adequate idea of the nature of the facts successively marshalled before the reader would be almost to reprint great part of the original *in extenso*. It strikes us as curious, it is at least unexpected, that in the commencement of the following chapter, speaking of the "Sposalizio," the authors characterise this picture as one which, though it reveals a capacity for refinement on the style of Perugino, is, nevertheless, one of the designs in which Raphael shows "absolute disinclination" to forget the lessons of his master. This is a conclusion that we must turn over in the mind, to say the least, before we can accept it. That he may, as the authors suggest, have drawn upon Perugino for the general idea of the composition of the subject (one upon which the master had not long before been engaged) is likely enough; but certainly we should have said that the pose and manner of the principal figures in the "Sposalizio" were essentially Raphaelesque.

In this same chapter (IV.) we have some remarks on Raphael as an architect. He and Perugino were not architects, in the strict sense of the word, but they were, in a sense, architects in their pictures, in addition to the practical architectural work which fell to Raphael's lot in a later period of his career. "But Perugino

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and Raphael started from different goals. The first acquired from the Florentines the traditions of Brunelleschi; the second was guided, we should think, by the lessons of Bramante." Perugino copied the Florence Baptistery in his picture of the "Delivery of the Keys," and in his "Sposalizio" at Caen he introduced an octagon building with domed porticos. Raphael, say the authors, broke away from his master in the matter of architecture; he made the octagon a sixteen-sided polygon, with a sixteen-sided colonnade, and crowned with a low cupola. This does not seem, however, so much "breaking away from" as developing the architectural idea of Perugino; at least, the transition from an octagon to a sixteen-sided figure is a natural and obvious one. As a matter of fact, however, Raphael's pictorial architecture is not good; it is wanting in breadth and solidity, and these deficiencies are the more conspicuous because there is an evident intention of making something good and probable out of the architecture, but neither Raphael's knowledge of construction, nor the principles of the styles from which he derived his architecture, served him sufficiently for the production of a really satisfactory result. His sketch-books, from the authors' account, appear to show evidence of his having frequently sketched, not only landscapes, but buildings in combination with landscape, and these were sometimes introduced with good effect into his pictures; but when he takes Classic architectural forms, they are generally constructed and made out in a way of his own, not always in accordance with true architectural proportion and stability.

The subject of Raphael as architectural designer is, however, dismissed very briefly by the authors, nor is this element a very prominent one in any part of his artistic career, in spite of his subsequent appointment as architect of St. Peter's. Following his further development as painter, we are called on to notice in the course of a very few pages no less than three other partial and passing phases in the style of Raphael. In his "Three Graces" he was realistic, and made three drawings from the same pretty model, happily grouping them so as to give varied movement, expression, and pose. In his "Apollo and Marsyas" he "worked almost entirely in the spirit of the antique." And immediately following on this we have the account of his going to Florence in consequence of the fame of Angelo's and Da Vinci's large cartoons, and becoming "enthusiastic for the style of Leonardo da Vinci." The quotations given from various maxims of Leonardo, in his tract "De Pittura," are very interesting, and they serve to show how minute and careful were the considerations into which the great painters of that day went in their works. "Temper the sun with a haze which shall interpose like a veil between the object and the luminary. You shall then have breadth of light without excess of shadow." "Never paint foliage when the sun is shining so as to throw light through the transparence of the leaves; for you shall then breed a confusion which an artist ought to entirely avoid." This is very characteristic of the period when figures were the main object of the painter, and landscape only a secondary matter, to be studied so far as was necessary to give effect to figures. The difficulty which Leonardo advises the painter to abstain from encountering is just one which a modern landscape-painter, in earnest about his art, would feel pride and pleasure in meeting and vanquishing; nor does it seem to have occurred to Leonardo what an exquisite effect that is in nature which he advises his reader to avoid trying; it merely occurs to him as tending to create "confusion." He has, it must be admitted, a saving clause on the other side: "Shun, however, the mistake of Botticelli, who thinks that a sponge, moistened with colours, thrown at a panel, will produce a landscape at one stroke:" an instructive sentence for the fashionable adorers of Botticelli. Another precept of Da Vinci the authors find to be decisively followed in some of the portraits by Raphael, that of Maddalena Doni, for instance; though the precise meaning of Da Vinci might be capable of different interpretrations. "If you see a figure standing in a dusky room, and look at it from the outside in the line of the light (?), the shadow will be dark and swimming. Paint that and you will have great relief and great softness." We should question whether this represented the precise meaning of the original, or whether (if it does) Leonardo himself had not used a word carelessly and not exactly conveying his meaning, which, it must be admitted, it would be rather difficult to convey in words, though most of us will understand what it amounts to. The passage illustrates the keen and searching way in which Leonardo regarded the conditions of objects in reference to their capacity for treatment in painting. The authors more especially instance the "Madonna della Cardellino" as exhibiting in detail the results of Leonardo's teaching, in the drapery "with grand simplicity and sweep of fold," and the pyramidal composition, to which the Virgin's face forms both apex and focus. "All the affectation and conventional grace of the Umbrian has vanished, to make room for something better and more refined."

The present volume of the "Raphael" is deficient in one addition, which goes far towards the popularity of a biography of this kind,—it has no illustrations. Perhaps it is intended that these should be added in a future volume, or the authors may have thought that most persons who would appreciate the book would be sufficiently acquainted with Raphael's works to follow the remarks, or would know where to look for drawings and engravings. Even to such, however, facsimiles of some of the more rare class of studies would be of high interest, more so perhaps than to the general reader. The book, however, is not for "the general reader," who will probably not understand its interest, its line of argument, and its deductions. It is a book for those who take art and art-history seriously, as a subject worth careful thought and study. The number of these, in proportion to the mass of readers, has undoubtedly increased of late, and to all these Messrs. Crowe and Cavalcaselle's "Raphael" is a necessity, — a book which their library "cannot be without." We have seen few books of biography containing such an amount of solid information as this. There is no padding in it; every page must be read; and considering the amount of information compressed into it, the book is not only clearly arranged, but remarkably readable; and though the style must necessarily, in such a case, be a little dry, as reading, every now and then it is brightened up by a little outbreak of enthusiasm, just sufficient to show that the writer's heart as well as his head is in the work. In the midst of the more serious details, too, little traits of Raphael's habits in working come out, as in the mention of one of the sketches for the pathetic subject of the Entombment, in the midst of which it seems that "a gayer spirit comes over him, and on the back of his paper he gives in sprightly lines a concert of antique figures, a woman with a harp, a youth playing the viol, and a satyr blowing a trumpet."* In these and other such incidents we seem for the moment to be brought more nearly face to face with that wondrously-endowed worker of the cinquecento period; we come near him and look over his shoulder in his moments of relaxation, and recognise the healthy playful human nature which enabled him to give to his Madonnas that combination of spiritual feeling with human grace and motherly tenderness which we find, in the same balance and completeness, in no other sacred art but that of Raphael.

* One of the Oxford drawings.

PUBLIC WORKS AND BUILDINGS IN LONDON AND SUBURBS,

IN THE SIXTEENTH, SEVENTEENTH, AND EIGHTEENTH CENTURIES.

Among the numerous interesting manuscripts preserved in the Public Record Office we have recently discovered a remarkable and unique series of accounts relating to money expended on the royal palaces and other state buildings and works in and about the metropolis, and other royal seats in the country, such as Windsor Castle, &c. These curious, voluminous, and instructive documents exhibit the materials, quantities, and prices of the articles used; also the workmen's wages per day; and in the case of "task-work," the sum paid for a specific job is duly set forth. These MSS., extending over 300 years, commence in the reign of Queen Elizabeth, and are carried down, year by year (except during the Commonwealth, when they do not appear to have been kept), to the reign of George IV. Our first transcript relates to the Tower of London, in the year 1563-1564, when 153*l.* 10s. 10½d. was incurred for materials and wages, for "repayringe and mendynge of the windowe of freestone in the p'sonnes there; repayringe of floores, and the wharffe at the Iron gate nexte Seynte Katherins and otherwise," viz., for:—

Timber, 12s. the load; quarters, 3 load at 12s.; rafters, 1 load, 12s; quarter-boards 2,506 at 2s. 4d. the hundred (ij^{ml} v^{c}, vj foote at ij^{s} iiij^{d} C.); eves bordes, 1 hundred at 3s.; elm planks at 11s. the load; alder poles, 3 loads at 5s.; laths, 2½ loads at 16s.; billets and talwood, 2 loads at 6s. 8d. Bricks, 15,000: 11,000 at 10s. and 4,000 9s. the thousand; tiles, 28,000: 18,000 at 10s., 10,000 at 9s.; "roufe & hyve tyles" [qy. roof and eve tiles] at 8s. and 8s. 4d. the hundred; tile-pins, 15 bushell, 15s.; lime, 3,400 [cwt.] at 6s. the hundred [qy. cwt.]; hair, 8 quarters at 2s. 8d. the quarter; sand and loam, 38 load at 10d.; lead (cast) 1,400, at 12s. the hundred [cwt.]; solder, 2½ cwt. (cc di.) at 5d. the pound; wax and rosin, 14d.; Spanish oker, 4 dozen, at 4s. the dozen; oil, 4 dozen, at 1s.

Timber at 10s., 11s. 6d., 12s., 13s. 3d., and 14s. the load. Boards of divers sorts, as Ealm boards, "Plaunch boards," quarter-boards, inch-boards, deal boards, and plane boards, provided and bought at the several rates and prices of 4s. 6d., 3s. 8d., and 4s. the hundred, and at 3s. 4d. the board.

"Quarters and pounchions pvyvid and bought at the sevrall Rates of xij^{s}, xiij^{s} iiij^{d}, and xiiij^{s} the lode bestowed and employed at the Tower of London," &c. Planks at 5s., 5s. 6d., 7s. 6d., and 8s. the hundred. Rafters at 12s. the load. "Jeists" at 11s. and 12s. the load. Waynscots at 5*l.* 10s. and 7*l.* 10s. the hundred. "Tallewood, Bylett, and Fagott, viz., Tallewood, at 2s., 3s. 6d., and 4s. the load. Bylett and Fagott at 7s., 7s. 10d., and 10s. the thousande." Laths at 16s., 18s., and 22s. the load. Hurdles at 5s. and 5s. 6d. the load. Tilepins at 10d. and 12d. the bushel. Poles and masts for scaffolds at 5s. 6d. and 8s. the load. Four ladders cost 14s. 10d. Nails of sundry sorts, viz., "doble tennes," at 10s. 6d. the 1,000; "single tennes" at 5s. 3d.; sixpenny at 3s. 4d.; fourpenny at 2s. 10d.; "Russe nayles at xiiij^{s} the sumo" (the lot); the bagg and twopenny nails at 12s. the lot. Iron work, viz., locks and keys, at several prices; hooks, hinges, &c., 5*l.* 19s. 8½d.; baskets, spades, shovels, and other small necessaries, 1*l.* 9s. 8d.; glazing at 6d. the foot, and repairing of glass at 2d. the foot.

The wages were as follow:—Masons at 1s., 11d., 10d., and 9d. per day; carpenters at 1s., 11d., and 10d.; bricklayers and tilers at the same rate; plasterers and plumbers at the same rate; sawyers at 1s. 10d. the couple; pavors, for paving 80 yards, at 2d. the yard; common labourers, 8d.; and "John Swythen, clerke of the checke and Ov^{r}seer of the woorkemen and labourers, xlvj dayes, at x^{d} per diem," 38s. 4d.

Carpenters serving in the said works at the several rates of 8d., 9d., 10d., and 12d.,—664*l.* 4s.

Joiners at 9d., 10d., 11d., and 12d.,—85*l.* 8s. 6d.

Masons at 9d., 10d., 11d., and 12d.,—98*l.* 7s. 8d.

Bricklayers and tilers at 8d., 9d., 10d., 11d., and 1s.,—419*l.* 0s. 8d.

Sawyers at 1s. 8d. and 1s. 10d.—174*l.* 8s. 8d.

Plasterers at 9d., 11d., and 12d.,—105*l.* 18s. 1½d.

Plumbers at 9d., 10d., 11d., and 12d.,—112*l.* 5s. 8d.

Founders at 8d., 10d., and 11d.,—1*l.* 2s. 2d.

Matlayers, 8d., 9d., 10d., & 11d.,—22*l.* 15s. 10d.

Painters "sarvinge in the said workes by greate, viz., at West'm, for payntinge of my dozen Treyne platters at iij^{d} the pece, xij^{s}, and for payntinge the fountayne at Windsor Castell, by greate,* xx^{li}, amountinge in the hole to xx^{li} xij^{s},"—20*l.* 12s.

Scaffolders at 8d., 9d., and 10d.,—8*l.* 3s. 2d.

Sklaters (qy. slaters) at 9d. and 11d.,—7s.

Smiths at 8d. and 10d.,—2*l.* 8s. 8d.

Carvers and cutters in stone and wood at 8d.,—9*l.* 10s. 2d.

Pavors "for the waseges of 10d. the day as after the rate of 2d. the yard by reate,"—46*l.* 5s. 7d.

Limeburners at 9d and 11d.,—30*l.* 12s. 8d.

Butmakers at 8d. and 11d. the day "in mendynge and makinge buttes at Windsor Castell, amountyng in the hole to 1*l.* 14s. 10d.

Mesers-cowrers at 9d., 10d., 11d., and 12d.,—20*l.* 5s. 10d.

Gardeners at 3d. and 12d.,—107*l.* 16s. 4d.

The surveyor of the works and buildings was allowed 6s. 6d. a day for his travelling

* To work *by great* is to work by quantity instead of b day. What are "Treyne platters"?

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expenses by land and water; the comptroller, the master carpenter, the master plasterer, and the master plumber received 2s. a day for the same purposes.

The following account of works and buildings done in, upon, and about Whitehall, "*alias* the New Palace of Westminster, and divers other places belonging or neigh adjoining thereunto," during the year 1582-1583, exhibits the cost of building materials and workmanship in the metropolis 300 years ago. On this occasion the sum of 572*l.* 2s. 4d. was expended upon those buildings for "taking up and laying again with Mebrow deals the terrace, about the preaching-place; mending a great bay window in the Lord Chamberlain's lodgings, making a door in the Lord Treasurer's lodgings, and a new partition in the standing wardrobe, mending the gallery assigned to the phisicians for their medicine-room, and repairing the two pair of stairs belonging to the same; as also for new working of a frame to enlarge Mr. Henry Sackford's and the Clerk of the Spiceries lodgings"; making and setting up rafters for a shed on the gallery next the privy bridge; making a new cistern-frame in the well larder, enlarging the office of the chandlery, together with making new doors, and a window for the same, new joisting and bording the roof over the porter's lodge, mending the great gate towards bakehouse, setting up a pole 20 ft. long in Scotland-yard, repairing a well of the crane there, as also of the store-house in the timber-yard, laying new planks and fastening the old upon Westminster Hall bridge; making a new chimney in Mr. Sackford's lodgings, and a chimney and furnace in the chandlery, rising a new chimney in Mr. Field's chamber, mending sundry bake-hearth, ranges and ovens; "laieinge of divers ground silles, underpinninge of ground plate"; paving not only of the gallery in the passage to the Earl of Leicester's lodgings, but also of the boiling-house and of divers kitchens where need was; working and setting of old and new crest, as well in sundry battlements, as also in other places about the house fallen into decay; taking up the fountain-steps in the garden, laying them again, and filling up the joints with cement; hewing a hearthstone grate, and sluice for the bridge at the entrance in St. James's-fields; new slating the side of the hall towards the Thames, and repairing the other side in places needful; lathing, ripping, and tiling in divers rooms, as the privy lodgings, the silk house, the gallery towards the park; the Earl of Newcastle's lodgings, the side of the roof next the porter's lodge, the still-house, the postries, the workhouse in the tilt-yard, and at St. Stephen's in the lodgings of the officers of receipt; covering with lead the roof on the porter's lodge, making two new pipes of lead for conveyance of water from the town, mending the lantern in the hall, the leads on the standing wardrobe, and certain leaden pipes in the orchard; soldering faults and frets not only in divers places of the said house, but also on the leads in the St. Stephen's, and the leads and gutters at St. James's, and stopping pipes there, cleansing the sluice in Scotland-yard, and divers sinks and valves about the house; new lathing a ceiling near the jewel-house; repairing, lathing, and laying divers walls near the same; new matting the Lord Chamberlain's, the Lord Admiral's, the Earl of Warwick's, Mr. Middlemore's, Mr. Hawarder's, and Mr. Chawoorthe's lodgings, together with mending and piecing old mats in sundry loopings about the same court, and for the attendance of sundry artificers, officers, and others, with divers necessary provisions for the performance of the said works, which in their several natures, quantities, and prices are expressed in money and form following, viz.:—

Timber, 54½ loads, 9 ft., viz.:—27 loads, 4 ft., at 10s. the load; 10 loads, 17 ft., at 11s.; 2 loads, 20 ft., at 13s. 4d.; 5 loads, 25 ft., at 14s.; 6½ loads, 4 ft., at 25s.; and 2 loads at 16s. Rafters, 12 loads, viz.:—7 loads at 12s., 3½ loads at 13s. 4d., and 1 load, with carriage, 14s. Quarters, 6½ loads at 12s. Joists, 2½ loads at 12s. Planks of breadth, "ij. at vij^{t}. the piece (beside one load spente of ye Remayne)." Boards, 5,625 ft. ("v^{m} vj^{c} xxv^{foote}"), viz.:—4,075 ft., at 3s. 4d. the hundred; 1,550 ft., at 4s. Deals, or "mebrow deale boordes," 830 ft., viz.:—800 at 6*l.* the 100, and 30 at 12d. each. "Dressers of beache," 1, 7s. Talwood, 6 loads at 4s. Billets, viz.:—13,500 at 6s. 8d. the 1,000, and 1,404 at 10s. the 1,000. One lever, 16d. Hurdles, 4 dozen at 4s. per dozen. Bricks, 32,500, at 10s. per thousand. Tiles, 24,000, viz.:—23,500, at 10s. per thousand, and 500 after, 12s. the thousand. Roof-tiles, 350, at 10s. per hundred. Slates, 25,000, viz.:—5,000 at 10s. the thousand, with carriage, and 20,000 at 9s. ditto. Laths, 6½ loads, viz.:—1½ load at 20s., 5 loads at 17s. per load. Lime, 3,500 (cwt.) at 6s. the cwt. Loam, 17 loads at 8d. the load. Plaster of Paris, 2 tons, at 12s. per ton. Hair, "xxij bwz. at vj^{s} the bwz." (qy. bushel). Ragstone, 2 loads at 3s. the load. Rigatestone, 4½ tons and 2 ft., viz.:—2½ tons at 12s. 10d., and 2 tons at 14s., per ton. Watertable stone, 3 ft., at 10d. per foot. Wrought-face stone, 8 ft., at 12d. per foot, with carriage. Mats, 40 dozen, at 4s. the dozen. Packthread, 16 lb., at 8d. per lb., and for brown ditto, 10d. Soder, viz.:—"cc. qr^{t} xiiij^{lb} at vj^{d} y^{e} lb., vj^{t} xiij^{li}, and for ffounders* Soather and ciment vj^{s} viij^{d}, in all vj^{li} xix^{s} viij^{d}" (233 lb. at 6d. per lb. = 6*l.* 13s.). Lead, "iiij^{lb} ix^{c} qr. v^{lb}" (4,933 lb.), at 12s. per cwt. Coals, 30 casks, viz.:—25 casks at 4s., and 5 ditto at 8s., per cask. Sand, 4 loads, at 6s. per load. Clay, 4 loads, at 10s. per load. Gravel, 1 load, 8d. Hay, 2 trusses for 16d. Nails, of sundry sorts and price, 19*l.* 12s. 0½d. Brooms, of divers scantling, 16*l.* 2s. 8d. Bast rope, 3 pieces, at 15d. the piece. Canvas, 10 ells, at 1s. 2d. the ell. Tape, 1 ell, 2s. Water-tubes, 2, viz.:—1, 2s., and 1, 2s. 6d. Hogsheads, 2, at 16d. each. Hoops, 18, at 2d. each. Pales, 8, at 6d. each; 1 file, 10d.; 1 hammer, 12d.; 1 pair shears, 10d.; 3 shovels, at 8d. each; 2½ dozen baskets, 2s. 4d. per dozen; 1 lantern, 2s.

Joiners' work, viz., a "wainscoat cubbord" to keep books, 14s., a small wainscot casement 16d., another "wainscote cubbord" for the office 8s. Ironwork, viz., plate-locks, staples, keys, sockets, "crosse-garnetts," bolts, hooks, casements, together with sharpening, and "battering of tools," and attendance, 14*l.* 4s. 1d. Brasswork, viz., one brass cock at the Star Chambers, 3s. 6d.; one cock and a masher in a cistern there, 6s.; 3 cocks in the removing and withdrawing chambers, viz., 1, 3s. 4d., 2 at 3s. 6d., and 1 at 4s. Glass and glazing, viz., new glass at 6d. the foot, new setting in and leading old glass at 3d. the foot, mending panes and casements at 4d. each, and setting in quarrells at 6d. each.† And several small necessaries, viz., 1 buckram bag 20d., 5lb. of wax at 8d. per lb., 3lb. rozin at 6d. per lb., 8 buz. of slate-pins at 3s. 10d. per buz., 6 buz. and one peck of tile-pins at 12d. per buz. [The abbreviation "buz." in this instance apparently means bushel.] 2 doz. wodden buttons at 8d. per dozen, 8 links at 8d. each, 29lb. of candles at 3d. per lb., 1 cast of counters 20d., writing-tables 1 pair 2s., 3 reams of paper at 8s. per ream, pay-books 12s. 6d., 1 "pottle" of ink 3s. 4d., 1 brass dust-box 4s. 6d., 1 lb. of pin-dust at 12d. per lb., and for leather 6d.

Workmen's daily wages included, carpenters at 12d., "and prentices" at 10d., joiners at 12d., masons at 12d., tilers and bricklayers at 12d., slaters at 12d., plumbers at 12d., plasterers at 12, "and their prentices" at 8d., matlayers at 12d., tentmakers at 12d., "mazerskourers" at 12d., labourers at 8d., and sawers at 22d. the couple. Painting, viz., to George Gower ("s'iant"), sergeant painter, for painting and guilding a new lion and the old "Phane," and the Crown supported by the said lion in oil colours to garnish the lantern over the hall 4*l.* Pruveyors, Griffith Jones 16d. and 12d. per day. Storekeepers, viz., John Whitwell of his pains in taking the note of the receipt and delivery of the said provisions at 12d. per day and John Marshall of his like service at the same rate. Clerks, viz., John Marshall, John Thorpe, and Mathew Swetzer, for ingrossing the pay and signed books and attending on the office, at 12d. each per day.

Taskwork.—Henry Deacon, sergeant plumber, for casting lead, was paid at the rate of 20d. per cwt. Richard Dickson, carver, "for portraying and making of a new lion of iij foote highe for the Lanterne over the hall," 20s. William Philipps, turner, for turning 18 balusters at 4d. each; Francis Rench and other slaters, in part payment, for lathing and ripping the hall, 5*l.*, and to them, in full payment, for finishing the said work, 11*l.* Richard Steppes, pavor, for 51 yards of ragstone paving in the Lord Chamberlain's lodgings, at 2d. the yard; Henry Holton for 12 yards of paving work at 2½d. the yard. Thomas Graves, surveyor of her Majesty's works, for his attendance, diet, and boat-hire and riding charges, at 4s. per day; and to the Comptroller of the said works, 2s. per day.

Turning to the account of the works and buildings at the Banqueting-house, the cost of materials, wages, &c., is much the same as above transcribed. Thus, John Wattingley, joiner, for "four great wainscote doors 7 ft. high and 4 ft. 2 in. broad, being whole wainscote thickness," was paid for them 25s. each. George Gower, sergeant painter, for laying all the windows and joint-pillars with white lead, oil, and russet, consisting of 504½ yards, was paid at the rate of 16d. per yard. "As also for laieng ye armes our ye porch in oil mixte wth white & blacke, cont' xij yardes di. at xiij^{d} ye yarde, xvj^{s} viij^{d}." For laying sixty-three great casements in white lead and oil 40s., and for painting all the outside walls of the Banqueting-house, embracing 868 square yards, cost over the said work after the perfecting thereof, at 9½d. the yard, 34*l.* 15s. 2d.

Upon Westminster Hall 10*l.* 1s. 6d. was laid out for working new corbel stone for the more safe supporting the closet of wainscot near the King's Bench, on the side towards St. Stephen's, somewhat inclining to ruin, flooring the said closet and boarding it again, "as also takinge downe and yotting with crampins the grate betwixt Scotland-yarde and Charinge-crosse," viz., 100 ft. of boards, 3s. 4d., Canestone (qy. Caen); 1½ ton, 11 ft., at 15s. per ton; 1 cwt. lime, 6s.; 3 load of sand, 16d.; nails of divers price, 5s. 8d.; 15 crampins of iron at 4d. each; and carriage of boards, stones, and scaffolding stuff, 6s. 4d. Wages of masons and carpenters were at the rate of 12d. per day; scaffolders got 10d., and labourers 8d. a day. Richard Dixson, carver, for carving the royal arms in stone, received 13s.

In St. Stephen's 2*l.* 5s. 1d. was expended in making a new way for the Lord Treasurer to pass to the Court of Wards, viz., for framing a great new door next the Town Court-house, with necessary posts to it, and making two bridges, one in the said Court-house, the other in the said yard at St. Stephen's, as also posts and rails about the bridge, "and of a greate shuttinge of boordes with two leaves"; 2*l.* 9s. 8d. was also disbursed for work and labour done in the said Court-house, for making new windows, shutters, and doors for the better preservation of the wines kept therein, viz., 300 ft. of boards at 3s. 4d. the 100; nails of divers price, 6s. 4d.; 6 pairs of hinges, 1 great plate lock with vice, a close box for the door, and 7 black bolts with keepers and staples, cost 31s. 8d.; 8d. was paid for land carriage of timber stuff, and for the wages of a carpenter at 1s. a day, 11s.

In St. James's Park 15*l.* 4s. was expended for certain young elms, viz., for searching in divers places about the country, and conveying them thither, to be set for a walk to be made for her Majesty, viz., for purchase of 300 young elm trees at 7*l.* the 100, and labourers for their travel in seeking them about the country, 10s.

At Queen Elizabeth's favourite seat,—the royal Palace at Greenwich,—the large sum of 3,151*l.* 6s. 2¾d. was laid out in works and buildings done there during the year 1582-83. The cost of the materials, workmanship, &c., are much the same as those above mentioned, and do not call for a detailed transcription. It may, however, be noted that two new windows were made in the Queen's apartments "for her Majesty's better viewe into the orchard"; followed by a long entry for "new mattinge not onlie of the preivie Closset, the privie Chambr^{s}, ye standinge bead chamber, and the gallerie nexte adjoyninge, but also of the lorde Treasurers, ye Earle of Leicesters, the Earle of Warwicks, ye lorde Howardes, M^{r}. Vice-Chamblanes, M^{r}. Comptrollers, M^{r}. Secretaries, and the Gromes of the Privie Chambers lodgings, dius'e other aboute ye house, together with taking up, mendinge, clensinge, and laieng againe sondrie decaied matts, both in her Maties. and in noblemens and officers lodgings and roomes, with diverse other chardgs incident to the said woorks." A subsequent entry shows that 134 dozen of mats cost 4s. a dozen, and that 735 yards of "fyne matts" at 8d. per yard, amounted under this head to 48*l.* 4s. 9d. Three purveyors,—Walter Jennings, Griffith Jones, and Thomas English,—had respectively 17½d. 16d., and 15d. per day. For taskwork, William Tucker, carpenter, obtained 6*l.* for timber and

* Fodder, a weight for lead or other metals, usually about 2,400 lb.

† *Quarrells.*—A square of window-glass, properly one placed diagonally; anciently, a diamond-shaped pane of glass. Hence the cant term, *quarrel-picker*, a glazier. The word was applied to several articles of a square shape, and is still in use.

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workmanship of six new "cleare storie windowes"; and John Atsilde, carpenter, for "making clearstory windows, boaring, joisting, and quartering divers floors and partitions, and making stairs," received 33*l.* 13s. 4d. William Phillipps, turner, for turning nine great posts for the terrace at 3s. 8d. each, and for turning 105 balusters at 5d., received 4*l.* 6s. 1d. William Kirwin and John Ashton were paid 3d. per foot for laying 400 ft. of old stone in the kitchen and in the Lord Treasurer's Walk; "as also for clensing of lights, and ye stones of the Fountain," 4*l.* 19s. 6d. George Gower, sergeant painter, received 287*l.* 13s. 11d. "for laying of all Timber windows and their barres aboute her Matie and Noblemen's lodgings, in white leade and oile, for Moulding of Cornisches, Architraves, gable-ends, Porches, dores, Balasters, Raills, Peri-stalles, and boultelles in the Conduit-courte, and two other Courts, and in the Hall, conteyninge M^l^ vij^c^ vij yardes di at xvj^d^ the yarde [1,707½ yards at 16d. per yard]; and for laieing of other clearestorie windowes, upright barres, peristalles, trimm piece, peraments, casementes, and lettice, &c., partelie with white leade and oile, in distemp', and partlie wth Russet, in all ciiij^xx^ vij^ll^ xiij^s^ xj^d^." John Ashton and two other pavors were paid at the rate of 2d. per yard for paving the Conduit-court and other places thereabouts with ragstone. And William Palmer, founder, for casting four brazen pullies and supplying 20 lb. of new brass, received 16s.

CROYDON PALACE AND THE ARCHBISHOPS OF CANTERBURY.

"Feci quod potui; potui quod, Christe, dedisti."

As the current lease from the Ecclesiastical Commissioners will shortly expire, the inhabitants of Croydon intend to purchase the remains of the ancient archiepiscopal palace and devote them to some philanthropic project, in memory of the late Primate.

Many antiquaries would identify this town with the Noviomagus of the Romans. It is certain that to the end of the last century traces were visible at Broad Green of the Roman or British road from Arundel to London.* Cited in the book of Domesday as Croindone, containing twenty plough lands, the manor belonged to Lanfranc soon after the Conquest, and has been ever since annexed to the Metropolitical See. Under the Commonwealth, however, it was let to the Earl of Nottingham for an annual rent of 40*l.*, and then to Sir William Brereton, Colonel-General of the Cheshire forces, who being a notorious *gourmand*, turned the then chapel into a kitchen.† The manor was valued *temp.* King Edward the Confessor at 12*l.* per annum, and in the Conqueror's time at 27*l.* to the Archbishop, and 10*l.* 10s. to his men. In the Parliamentary survey of the year 1646, its yearly value is scheduled as 274*l.* 19s. 9½d., exclusive of the timber. Croydon Park, of which William Walworth was once keeper, had been given to King Henry VIII., by Cranmer, but was returned to him by King Edward VI.

The palace or manorial house‡ formed for several generations a residence of the archbishops of Canterbury, of whom but few have not dated some of their public acts therefrom. Here in great solemnity Courtenay received his pall (1381), and here Arundel, Chicheley, and Stafford, his successors, in turn chiefly lived. A prisoner in England, King James I. of Scotland dates from Croydon, *anno* 1412, a charter of the barony of Drumlanrig to Sir William Douglas, he being there in Arundel's custody during that prelate's second tenure of office. Parker, so celebrated for his learning and virtues, entertained Queen Elizabeth and her court for seven days at Croydon. It was on this occasion that the queen, taking leave of the first Protestant archbishop, and acknowledging his hospitality, turned to Mrs. Parker with the words:—"Madam I may not call you, mistress I am loath to call you, but I thank you for your good cheer." A similar visit was contemplated, if not actually accomplished the next year. A memorandum exists of the allotment of their several chambers, in many cases their "old lodgings" or "where he was," to the lord chamberlain, the lord treasurer, the lady of Warwick, the "gentleman hussers," the "physycyons," the "Queen's wayghters," the "Queene's robes," the groomporter, &c. It is amusing to read of the perplexities due to the expected arrivals of my lady of Oxford, Mr. Hatton, and my lady Carewe (from Beddington), for whom no rooms with chimneys could be assigned.* Whitgift, whom she used to call her "little black husband," entertained the Queen frequently, the last time she dined with him here being within three years of her death.† Sir Christopher Hatton was made Lord High Chancellor at Croydon in 1587, Whitgift having declined that honour. This archbishop, together with Tenison and others, was a munificent benefactor to the town. He founded during his lifetime the schoolhouse and hospital to which Dr. Tait referred in one of the last of his recorded utterances. It is a good, though plain, Elizabethan building, at the north-eastern corner of the High and George streets. In the chapel are preserved the founder's portrait, inscribed with the quatrain of which the opening line stands at the head of this article, with one said to be of his daughter, and a curious representation of the "Dance of Death." The hospital possesses three old wooden cups, whereof one, with a capacity of three pints, bears the legend:—"What, sirrah! hold thy pease, thirst satisfied cease." Abbot, who seldom left Croydon, gave great offence by forbidding the reading in the church of the proclamation for sanctioning certain sports and pastimes on the Lord's Day; he scandalised the clergy in accidentally killing a keeper when hunting at Bramshill Park (1621). Clarendon describes him as "a man of very morose manners and sour aspect, which in that time was called gravity." After Laud's execution the see was vacant for a space of sixteen years. Juxon, who must ever be remembered as the repository of the last injunction of Charles I., was appointed thereto at the return of King Charles II. He carried out many repairs in the residence, and rebuilt the chapel that Brereton had profaned. His successors continued to live here until the translation of Hutton from York in the year 1757. Twenty-three years later, during Cornwallis's primacy, the untenanted buildings were sold for 2,520*l.* to Sir Abraham Pitches, knight, and the proceeds applied towards the cost of Westminster Bridge. Stafford's hall (of date 1443), the guard-chamber (built by Arundel), and other premises, except the chapel, have lately been in the occupation of a bleacher, whose drying-ground is the garden and vineyard, of which a record exists *temp.* Edward II.‡

In the year 1808 Archbishop Manners Sutton purchased Addington Manor for a summer residence. This his successor, Howley, adopted as his chief abode, laying out the present park because he found that his own garden at Lambeth suffered so much from the neighbouring kilns and factories. Of the two ancient manors at Addington (antiq. Edintoune), that which passed to the archbishops was known as Aguillon's or Bardolph's. At the Conqueror's survey it was taxed at eight hides, and held by Tecelin, the king's cook, on grand serjeantry, to be enjoyed by the tenure of presenting to the sovereign upon his coronation a dish or mess of gyron,—when marrow was added thereto, maupyrgernon,—a custom observed to a comparatively recent age. Sir Robert Aguillon received a patent in the 54th Henry III., to fortify and embattle his house at Addington. That house, on Castle Hill, was pulled down and a second built at the foot of the hill, bearing the inscription,—

"In fourteen hundred and none
Here was neither stick nor stone;
In fourteen hundred and three
The goodly building which you see."

This again made way, about 100 years ago, for the present manor-house, which embodies the chapel, library, and other rooms added by Archbishop Howley. A fine avenue leads to the site of the former structure.

The disastrous fire of 1867 destroyed nearly all the monuments in old Croydon church. These comprised those of Archbishops Grindal (1583) and Whitgift (1604), with the fine tomb and recumbent figure, in full canonicals, of Sheldon (1677),—the work of two obscure English artists, "Latham, the City architect, and Bonne." Relics of the two former monuments lie in a vault beneath the organ. In this church, which, with the exception of the tower, was rebuilt by the late Sir G. Scott, on its former plan, were buried Archbishops Wake (1737), Potter (1747), and Herring (1757), each having held the see for ten years. Herring expressly forbade the erection of any monument above his grave. Abbot died at Croydon on the 4th of August, 1633, but in compliance with his will was buried at Guildford.

* See "Archæologia," vol. ix., p. 104.

† See "Mysteries of the Good Old Cause," a 12mo. pamphlet, 1663.

‡ The term "Palace" strictly appertained to a bishop's residence within his own cathedral city; all others were styled "houses." Lambeth Palace was known as Lambeth House until the present century. Letters of Juxon are extant, dated from his palace in London and his house at Fulham.

* The paper is bound with a MS. history of Croydon in the Lambeth Palace Library. It is signed by Bowyer, gentleman of the black rod, and is entitled, "Lodgings at Croydon, the Busshope of Canterbury's House, bestowed as followeth [Here follow the names with their respective apartments.] the 19th of Maye, 1574."

† See "Sydney State Papers," vol. ii., p. 210.

‡ In Hone's "Year Book" for 1845 will be found an interesting engraving of a carved stone escutcheon and canopy from the eastern wall of the palace which fell to pieces in June of the preceding year. The shield, supported by winged and crowned figures, bears the arms party per pale of Edward the Confessor dexter and sinister quarterly those of France and England.

CRITICAL COLUMN.

THE NEW ARMY AND NAVY HOTEL, VICTORIA-STREET, WESTMINSTER.

This striking erection, which has, no doubt, been noticed by many engaged in the profession, is not a bad subject with which to open the critical column. Any one passing down Victoria-street, and having an eye to architecture, will have his attention arrested by the manifest peculiarities of this design. Its main characteristic is power in the composition, joined to boldness, extravagance, and sensationalism in the detail. As a composition, this design has great merit. The bold entrance-doorway, the large and massive stone angle quoins, the windows down the side, the dormers, and main cornice treatment, all work together to an effective and well-balanced whole. The projecting bays are well conceived compositionally; they balance the very massive doorway treatment; the same applies to the stone treatment up to the first-floor cornice, by which the colour is carried uniform around a series of features meant to combine to a united artistic effect. Any introduction of brick in the lower portions of the design would compositionally have been a great mistake, solely on account of the colour contrast. On the side elevation, where brick has been introduced presumably for reasons of cost, there is no objection to its use, and the idea of the "stone composition" up to a certain level has been very cleverly retained by the manner in which the windows of several stories are drawn together into one continuous stone composition. This arrangement is compositionally of great merit; for not alone is the idea of the stone treatment up to a certain level very clearly expressed, but the opportunity is also afforded for making of this treatment striking individual compositions which tell strongly when seen in perspective with the doorway and projecting bays of the front elevation.

The faults of this design, as with most modern Renaissance works belonging to the present London revival, are mainly in the detail. The detail is very bold, which is well in accordance with the composition, but it is also vulgar, extravagant, sensational, which need not be, which is not artistic, and which spoils what might otherwise be a highly successful design. There is a studied attempt in the detail to do the unusual, the extraordinary, very likely with the view of creating a harmony with the strong lines of the composition; but it should be well borne in mind that extravagance of invention and large scale alone will not make a detail powerful, and certainly not artistic. Power is the result of relative rather than of absolute proportion, and as to good taste in Classic detail the same general lines must be followed for large detail as for small.

To begin with the doorway, the pedimental composition is too much pictorial and too little architectural. It reminded the writer strongly of the "painter" as an architectural designer, and called to his mind the book on designs by "Düterlin, of Strasburg." The freedom with which the foliated composition runs away with the mouldings of the pediments is too great; the approved way of stopping pedimental members where a central composition is introduced is to roll them up into a scroll or else to return them. This practice satisfies both pediments and centre feature. The entire ornamental compositions, the detail of the foliage, &c., are very vulgar and sprawling, and the

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oblique lines running down to the capitals are extremely ugly. As to the scroll into which the archivolt lines are rolled up immediately above the capitals, the lines simply defy all architectural understanding, and require to be seen to be laughed at. The column, with its capital, shows great lack of skill; for, given its dwarfed shape and the general composition of what it carries, much more might certainly have been made of it; by the adoption of a powerful scroll capital of the Grecian Ionic type (modernised), and by the introduction of a few square or octagonal bond-stones to break the short circular shaft, a feature much more effectively expressing its apparent function would have been obtained. The Ionic scroll pattern (Grecian type) is precisely the form of capital most æsthetically appropriate in such cases, where the weight visibly acts in the direction of the scrolls, and it is capable of great variation and much original treatment. As to the doorway proper the sunk moulding running around it in the form of an architrave looks a little weak and tame in such close proximity to its powerful neighbours; as to the immense tea-urn-shaped vase in the circular opening above the doorway, it is to be condemned from every possible point of view; it is not required, and is very ugly as a detail.

The bay-windows are supported on a corbel, the carving of which is of the same coarse character as all the foliated ornaments throughout, much too realistic or naturalistic in connexion with other details and features, many of which breathe an air of genuine Classic. The detail of the mullion is very original, and contains much merit; but the manner in which the architrave mouldings are stopped when they come above the mullions is somewhat weak. This device, wherever and whenever it may occur, of introducing a carved boss or ornament of some kind to stop or cut off mouldings which otherwise might become troublesome, is very weak, and to be rigidly condemned; it is not an "architectural" solution of the difficulty, and especially not in any kind of Classic. If such mouldings cannot be taken down, nor up, nor returned in any way, they should be abolished altogether: and where they must be retained, the best thing to do is to cut them off square, neo-Grecque fashion. The panels between the two stories of the bays would have been far better sunk than raised. The angle-quoin treatment of the basement or ground-story is weak in appearance as an æsthetic substructure to those which follow in the upper floors. The grey granite in which they are built, and which is lighter in tint than the freestone above, does not excuse this; for art does not appeal to the reflective faculties in the first instance, but to the contemplative faculties, in this case to the eye; and the great strength of this grey granite corner should have been expressed by a quoin treatment more strongly marked even than that of the upper stories, not because it is required absolutely, but relatively, as being the æsthetic base of the upper quoins. These upper quoins are, with their rounded corners and deep joint mouldings, a very meritorious detail, but they have one great fault,—they do not tongue into the brick-work. This fact, joined to the contrast of the colours which here obtains, "isolates the corners," cuts them off æsthetically from the general wall work. It is a great defect, brought about mainly by the colour and the small-jointedness of brickwork; for were the wall adjoining the quoins built in stone, the defect would disappear at once, as the uniformity of the material, assisted by the faint joint-line running into the body of the wall, would at once reveal the structural unity of the wall in a manner satisfactory to the eye. Where quoins of stone are used in connexion with brickwork, they must be toothed into the brickwork in alternate courses, otherwise they will never realise the very idea they are applied for,—additional expression of the structural solidity of the corner. In this case, and therefore in every similar case, the quoins stand like an isolated stone pier at the corner, and completely fail to express their structural connexion with the body of the wall adjoining. As to the treatment and application of quoins, no portion of past architecture is so instructive as the Italian Renaissance. The palaces of Florence, especially, are a distinct quoin-style, and should be closely studied, for this feature of modern Renaissance art is capable of much extension. The writer believes that much progress could be made in this direction, as quoins admit of endless variation, and their application usually leads to a bolder and more original Classic treatment than follows in the path of the column or pilaster. This fact has long been recognised on the Continent; and, not to mention the Louvre, very effective work in this direction has lately been done in Paris and Vienna.

To return to our design with which we have now arrived above the stonework level, we perceive the painful bareness of the three brickwork stories. This is really the only compositional fault in the design. The brickwork portion is so bare and starved looking, so devoid of every attempt at architectural connexion with the remainder of the design, as to greatly spoil the design as a picture or impression of harmony. A string or band in stone or some stone treatment around the windows would greatly help the design as a balanced composition. The centre feature has certainly been carried up in stone, but compositionally it is a bad feature on account of the solidity of the centre line, presumably caused by a wall behind. Such centre walls should be avoided if it possibly can be done, but where it seems necessary to have a centre wall the difficulty in the façade is best overcome by introducing niches, or "recessed" panels with sculptured compositions. The idea is to "obliterate" the objectionable solid centre by setting it back, and thus visibly throwing out the adjoining window features. In point of detail the centre composition above the doorway feature is somewhat out of keeping with the remainder of the work. It is both finer and smaller, and should have been more on the lines of the side window compositions, previously referred to. The dormer windows are of a very squat appearance, with tremendous stonework heads, and the irrepressible tea-urn vase of gigantic proportions. They are extremely ugly, whereas the chimney must be pronounced a highly meritorious feature.

The roof shares the same fault which applies to all French roofs in London; it is set too far back from the wall face, which is caused by the gutter being formed behind a thick parapet. The character of the French roof seems entirely misunderstood in London. The French roof is an ornamental "continuation of the façade," and its plane should therefore be set as far front as possible, otherwise it will be lost to the view, especially in our narrow streets. This object, which is well understood in Paris, is accomplished by the roof being set on the cornice-stone, the gutter being formed in lead on top thereof and fastened into the stone. The gutter is highly effective, and, from its position, can, in most cases, be run in front of the dormer windows in a continuous fall, with down-pipes at the ends. This gutter can also be made a highly ornamental feature, as *vide* the hotels and other public buildings of Paris. The point here at issue is an essential one, which architects should take note of. We deceive ourselves in this respect with our drawings, on which the French roofs, starting up from behind the parapets, look well enough. As at present treated, all we usually see of French roofs of ordinary height is the top of the crestings, the dormer windows standing out in hard bare lines against the sky.

In conclusion, one point must be mentioned in regard to the design here criticised. It must be admitted that with all the faults of detail pointed out, the design has a redeeming feature which is absent in but too many modern works. This design, and also the detail in particular, has a great deal of character, the essential element of style. There is an idea at work in it, the idea of conscious striving after something unusually grand or striking. The remarks also show how subtle is the difference between good and bad in art, a line more here, one less there, is capable of making a vast improvement. As stated in the introduction, it is the detail which presents most difficulties, and which is capable of making a work one of merit or one of mediocrity, and it should therefore be deeply studied by the modern Renaissance designer.

SEMPERIAN.

The Royal Courts of Justice.—The whole of the roof of the Central Hall of the New Law Courts, as well as the roofs of the other portions of the buildings, have been covered by Messrs. Ashton & Green (Limited) with their "Permanent Green Slates." A very excellent job of slating it is, as we have previously had occasion to say. The colour and quality of the material are admirable.

PROJECTED NEW PUBLIC WORKS.

RAILWAYS, DOCKS, HARBOURS, &c.

THE list of private Bills for the session of 1883 is of a formidable character, and includes several projects involving a heavy outlay in construction in connexion with railways, tramways, docks, harbours, town improvements, and other undertakings. Of the total number of 275 Bills in respect of which notices have been given, 125 are in connexion with proposed railway undertakings. Of this number thirty-six of the Bills are promoted by companies proposed to be incorporated for the construction of entirely new lines in different parts of the country. Of the proposed new undertakings six are for the construction of additional railways in and immediately around the metropolis. These include a project designated the East London, Crystal Palace, and South-Eastern Junction line. The undertaking embraces a new line from the Ladywell Station of the Mid-Kent section of the South-Eastern Railway, terminating in the grounds of the Crystal Palace. Another project, called the Mid-Metropolitan, is for the construction of a new underground railway from Lancaster-gate, Uxbridge-road, to Aldgate and the Minories, passing through the parish of St. George, Hanover-square, and continuing eastward along Holborn and Newgate-street, to its terminus in the Minories. A third project,—the London, Hendon, and Harrow Railway,—is a new line which, commencing at Harrow, and, passing through Pinner, Kingsbury, Hendon, Finchley, and Hornsey, forms a junction with the Alexandra Palace branch of the Great Northern Railway, and thence proceeding north-west, terminates by a junction with the authorised Metropolitan Outer Circle Railway, in the Edgware-road. The Greenwich and Northern Lines Connecting Railway,—another of the new projects,—commences by a junction with the London, Blackwall, and Millwall Extension Railway, and, passing under the Thames to Greenwich, forms a junction with the Blackheath branch of the London, Chatham, and Dover line. Another branch from this point at Blackheath proceeds in the direction of Lewisham, terminating near the Lewisham Station of the South-Eastern Railway. The Kent and Essex Junction line is likewise a new undertaking, commencing at the St. Mary Cray Station of the London, Chatham, and Dover Railway, and thence proceeding on to Plumstead, Blackheath, and Woolwich, where the proposed line passes under the Thames, emerging from the river about 200 yards from the North Woolwich Gardens. Proceeding from this point the line terminates in the parish of West Ham, by junctions with the authorised Regent's Canal, City, and Docks Railway, and the Metropolitan Outer Circle Railway. The Poplar and Canning Town Railway is a further new project for the construction of a railway commencing near the Poplar Station of the London and Blackwall Railway to Canning Town, the line proceeding north-eastward, and almost parallel with the East and West India Docks on the south side. By the construction of this line the circuitous route by way of Stratford and Bromley will be avoided, and the distance between the City and Canning Town will be reduced by several miles.

The metropolis and immediate neighbourhood is likewise affected by thirteen of the railway Bills promoted by existing companies. The South-Western Company, in their general Bill, seek powers to effect a junction with the Metropolitan District line at South Kensington; also powers to widen the line between Waterloo and Westminster Bridge-road; and similar powers to widen the Hampton Court Junction line. The Midland Company's Bill includes powers for the construction of additional works at their new large depôt and dock at Poplar, which involves the purchase of land near the East and West India Dock station of the London and Blackwall line. For other works the Bill likewise seeks powers to purchase land and property in Whitechapel, near Royal Mint-street. The London and North-Western Company's Bill contains clauses empowering the company to construct a new street near the Euston station by a junction with Drummond-street, and to stop up a portion of Cardington-street. The Bill likewise contains powers to purchase the burial-ground attached to St. James's Church, Hampstead-road. The Metropolitan District Company's Bill provides for the construction of a new line in Hammersmith. The Great Eastern Company promote a Bill specially

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for the construction of a line from their station at Chingford to High Beech, Epping Forest. The projected line will be three miles long, and its estimated cost is 70,000*l*. About six acres and a half of the forest are proposed to be taken for the purposes of the line. The Charing-cross and Waterloo Electric Railway Company, which obtained its Act of Parliament last session, now promotes a Bill for the extension of the line in several directions. Powers are sought in the Bill to construct one of these proposed lines under King Charles's Monument and Cockspur-street; another line from the terminus of the authorised line in Waterloo-road to the subway leading from Blackfriars-road to Holland-street. In continuation of the line from Holland-street the Bill further seeks powers to carry it forward into the City, passing through the parish of St. Saviour, Southwark, and thence into the City through the parishes of St. James, Garlick-hithe, and St. Martin Vintry, near the junction of Upper Thames-street and Queen-street, terminating in Cornhill, close to the Royal Exchange. The Bill authorises the Company to appropriate "the under-surface of the river Thames, or of any street, road, or lands traversed by or situated near the intended railway or works." The Hounslow and Metropolitan Company promote a Bill for the construction of a branch from their present line at Hounslow to the Mill Hill Park Station of the Ealing extension of the Metropolitan District Company. The London, Chatham, and Dover Company's Bill contains clauses empowering them to purchase land and buildings in St. Sepulchre's parish, and also at Herne Hill, for extension works; and the North London Company apply for similar powers as to the purchase of land and buildings at Poplar and Bromley. The London, Tilbury, and Southend Company's Bill contains powers to make new branch lines at East Ham. The East London Company promote a Bill for the purchase of additional land and buildings in Whitechapel for carrying forward works in progress; whilst the Metropolitan and Metropolitan District Companies jointly promote a Bill for the purchase of additional land and buildings in Abchurch-lane, Eastcheap, and other parts of the City.

The additional powers sought for by several of the great companies in their respective Bills for extended works, are of considerable magnitude, more especially the projects of the London and North-Western, the Lancashire and Yorkshire, and the Great Eastern Companies. The General Powers Bill of the last-named company involves the expenditure of no less than 2,000,000*l*. It contains clauses authorising the construction of several new lines, many miles in length, in different parts of South Essex, including lines from Brentwood to Shenfield, Maldon, Burnham, and other districts not hitherto supplied with railway communication. The estimated cost of these several lines is upwards of 500,000*l*. Another line proposed is one down to Tilbury, forming a communication there with the new docks of the East and West India Dock Company, now in course of construction. The estimated cost of this line is 150,000*l*. The Bill also takes powers for the purchase of land at Harwich for the purpose of making a graving-dock, at a cost of 40,000*l*. Likewise powers to construct a large cattle-market at Stratford. Other clauses in the Bill provide for a very material enlargement of the Liverpool-street Station. In reference to this intended enlargement the chairman of the company stated at a meeting which has just been held, that the suburban traffic had developed to an extent largely exceeding the expectations of every one connected with the company, and a considerably larger station than they now had at Liverpool-street was necessary to carry on the traffic. He added, that unless they went to the enormous expense of buying up all the property lying between Liverpool-street and Bishopsgate-street they would only meet the requirements of the traffic for the next ten or fifteen years. The cost of the work from first to last would be from 1,000,000*l*. to 1,500,000*l*., and they proposed to take powers in the Bill to raise an additional 1,500,000*l*. by shares, and 500,000*l*. by borrowing. It was no use "nibbling" at it. At 4 per cent. 2,000,000*l*. of capital would mean 80,000*l*. a year, but he ventured to say there was more than 160,000*l*. a year additional traffic to be gained by the expenditure. The Bill, amongst other things, asks for powers enabling the company to have six lines from Romford up to Bethnal-green and Liverpool-street.——The Bill of the London and North-Western Company seeks for extensive powers for new works at Liverpool, and also at Preston. Powers are also sought for constructing a sea-wall at Llanrhos in Carnarvonshire, and also for the construction of a wharf, a sea-wall, and dock, with entrances and basins, on the River Conway.——The Lancashire and Yorkshire Company's Bill contains clauses providing for the construction of several new lines and other works in Wigan, Manchester, Liverpool, and other parts of Lancashire. The clauses in reference to Liverpool provide for considerable alterations in the railway levels in connexion with the widening of the line and other works for the large new station about to be erected near the Exchange. There are also clauses with reference to buying up houses and closing streets and the construction of new streets in lieu thereof consequent upon the erection of the enlarged station.

The tramway projects, including Board of Trade applications for Provisional Orders, are sixty-one in number, of which twenty-two are for proposed new tramways in the metropolis, eight of these being promoted by new companies. Two of the proposed undertakings, the Highgate-hill Extension and Archway-road, and the Haverstock-hill and Hampstead projects, are for the construction of tramways on what is known as Hallidie's steep-grade cable principle.

The Bills in respect of gas and water supply are considerably below the average of former years, being limited to sixteen in number, which, with seventeen Board of Trade applications for Provisional Orders, bring the entire number up to thirty-three. Included amongst them is a Bill promoted by the Southwark and Vauxhall Company, seeking powers for the extension of their limits of supply to include the districts of Wimbledom, Putney, Barnes, Mortlake, Roehampton, Sheen, East Sheen, Kew, Richmond, and Petersham. The Lambeth Water Company likewise promote a Bill for the purchase of additional lands in the parish of St. Mary, Lambeth, and also in Norwood.

There are twenty-two Bills having reference to the construction of docks, piers, bridges, and the improvement of harbours and rivers, fifteen of these Bills being in connexion with proposed new works. Amongst them is a Bill incorporating a company for the construction of a promenade pier at Torquay, 430 yards in length, together with a sea-wall 270 yards long, and other works in connexion therewith. Another company promote a Bill for the construction of a pier, pier-head, and landing-places, at the end of the Chain Pier at Brighton.—— There is likewise a Bill empowering the construction of railways and storage-sheds around the Bute docks at Cardiff.——The Tower Subway project is for the incorporation of a company with powers to construct a subway under the Thames, commencing at Great Tower-hill, and terminating in Southwark near the site of what was formerly Barclay & Perkins's Brewery.——A Bill promoted by the Thames Conservators empowers that body to erect works and buildings on the banks of the Thames, and also in the bed of the river. The Bill also gives powers to the Conservators to compel the owners and occupiers of manufactories on the banks of the Thames to take steps to prevent smoke and other noxious vapours.——The Porthleven Harbour Commissioners promote a Bill for the erection of a lighthouse at the mouth of the harbour.——The Bill for the construction of a ship canal between Liverpool and Manchester, with docks at Manchester, is also amongst the undertakings in this class.——A company proposed to be incorporated apply for powers to construct a wharf and other works at Portsea, close to Portsmouth Harbour.——The Penzance Corporation apply for powers to construct a new dock and to make alterations in the existing harbour and docks.——The Southend Local Board promote a Bill to extend and improve the existing pier by lengthening it to the extent of 330 ft., and at the end constructing a pier-head running from east to west 300 ft., and from north to south 120 ft.——The Tower (Duplex) Bridge project incorporates a company for the construction of a bridge, with loop bridges thereto, and a swing-bridge therein, with road approaches, over the Thames, from Free School-street, Horselydown, to Little Tower-hill. The swing-bridges are stated to be for the passage through of ships and other vessels.——The Corporation of Preston to promote a Bill for improving the navigation of the River Ribble, and constructing docks at Preston.——The Newport Dock Company promote a Bill for the construction of a new lock and entrance to the company's dock.——A Bill promoted by authorities at Great Yarmouth seeks powers for the construction of a tidal harbour six acres in extent, together with locks, quays, docks, and piers.——A company to be incorporated seeks powers to construct an opening bridge over Langston Channel, between South Hayling Island and Southsea.

Bills in respect of town and street improvements are numerous, and many of them involve works of a comprehensive and costly character. The Metropolitan Board of Works promote a Bill in which extensive powers are sought for street and other improvements in different parts of the metropolis. The powers include the construction of a new street from the Holborn Town-hall to the Angel in Islington; the widening of Upper-street, Islington; Green-street, Bethnal Green, and Little York-street, Bethnal Green; also a new street from Trinity-square to the Minories; a new street in Hampstead, from High-street to Church-lane; a new street in Bermondsey, from Abbey-street to Rothsay-street; and a new street from South Lambeth-road to Walton-terrace. The proposed new street from Holborn to the Angel will be carried over the Metropolitan Railway near Farringdon-road, and also over a portion of the site of the New River. The Metropolitan Board have also a separate Bill conferring upon them new powers as to the accommodation to be provided for the labouring classes. Amongst other town improvement Bills are those promoted by the Corporations of Liverpool, Nottingham, York, Birmingham, Longton, Barnsley, and other places, all of which have reference to extensive street-construction and largely-increased sanitary powers. The Liverpool Bill likewise contains clauses as to the control of street musicians, the control of juvenile traders, the pulling down of notice-boards, and the regulation of bicycles and velocipedes. The Nottingham Bill embraces powers for the removal and re-interment of bodies and the construction of recreation-grounds. The powers sought by the Bill promoted by the Birmingham Corporation include the building of a school of art and science, and also the erection of new assize courts, either for the borough or for any assize district.

A special feature amongst the several applications consists of the Bills seeking powers for the construction of new markets in different parts of the metropolis. There are four Bills of this character.

The South Kensington Market Company apply for powers to erect a market, with shops and other buildings for the sale of hay, corn, and other cereals, fish, meat, poultry, fruit, and vegetables," on a site bounded on the north side by Fulham-road, on the south-west by Sydney-street, and on the south-east by Cale-street, formerly Bond-street.

Another Bill seeks powers for the erection of a similar market in Paddington, the site being between North Wharf-road, Harrow-road, and Church-road.

There is likewise a Bill incorporating a body under the designation of the Mid-London Market Company, which seeks powers to construct a market of an underground character in the neighbourhood of the Thames Embankment. The site named in the Bill is in the parishes of St. Martin's-in-the-Fields, St. Clement Danes, and the Savoy, the areas named being westward from Savoy-street to Savoy-place and Savoy-hill, bounded on the north by Messrs. Rimmell's; also a site extending to Carting-lane, bounded on the south by the Thames Embankment; and the lands between Adelphi-terrace and the Embankment. The Bill asks for powers for the erection of an hotel, shops, warehouses, offices, and subways in connexion with the Metropolitan District Railway. It also takes powers to use the landing-place at Waterloo Bridge. The Fish Exchange Company have a Bill applying for powers to construct a fish-market on the banks of the Thames at Blackfriars, and for this purpose to purchase property including Maggeridge's granary, the City Flour Mills, Vulcan Wharf, Victoria Wharf, and St. Andrew's Wharf.

It will thus be seen from the above particulars that the private Bill legislation of next session is likely to occupy a considerable portion of the time of Parliamentary Committees.

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NEW PUBLIC OFFICES AT TEDDINGTON.

MR. WALTER TAYLOR, one of the members of the Teddington Local Board, has undertaken to erect public offices for the use of the district, under the following circumstances. At a special meeting of the Board held last week, Mr. Taylor offered to let on lease to the Board, for 99 years, a piece of land, at a ground-rent of 1s. per annum, on which the Board were to build new offices. At the meeting a pen-and-ink sketch, together with tracings of a handsome block of buildings which Mr. Taylor was in favour of seeing erected on the land, was submitted. In the course of a discussion which took place on the subject it was unanimously admitted that Mr. Taylor's offer was of a very liberal character, but that there was a difficulty in accepting it on the ground that the site would be leasehold instead of freehold, and that in consequence the Local Government Board would probably not allow the Local Board to build upon it. On Mr. Taylor being ask to sell the freehold of the land to the Local Board, he replied that he thought he had made the Board a liberal offer. He had heard it again and again expressed that the time had arrived when Teddington should have a suitable place in which its local affairs could be transacted,—a building suitable to the wants and requirements of the parish,—and it was this fact that had induced him to make the offer. He felt that he was in reality making the Local Board a present of 1,000*l.* at least, and he might tell them that if they rejected the offer it would be largely to his interest. He might also inform them that if they did not carry out the project he should do it himself according to the plans before them. He added that the proprietors of the bank were anxious to take a portion of the premises, and that two banking firms had made applications to become tenants. Ultimately, the Board resolved that they could not see their way to accept Mr. Taylor's liberal offer, the result being that Mr. Taylor will himself at once proceed with the erection of the new offices.

RECENT DISCOVERIES OF ANTIQUITIES.

THE poetry and art of modern times have derived undoubted advantages from the influences brought to bear on them by the discoveries which have been made, since the Renaissance period, of relics which tend to increase the knowledge which has come down from past ages, of the main features of Hellenic art.

The German nation claims in a special manner the merit of having, by the co-operation of its *savans*, and by means of the money granted by the State (more than 30,000*l.*), brought to light at Olympia objects not only of antiquarian interest, but also, to a great extent, of artistic value as models of antique workmanship. In a work on the subject of the explorations at Olympia, Herr Adolph Boetticher, who acted during several years as the accredited representative of the German Government at the Olympian excavations, has recorded (according to the *Cologne Gazette*) a number of facts which tend to illustrate, and in some points to modify, the description of Pausanias, which is contained in a manuscript discovered in the earlier part of the fifteenth century, and which was translated into German by Johann Jacob Fugger. The subject of inscriptions is fully dealt with, and several new theories are propounded with respect to the architectural and plastic arts as practised in ancient Greece. Several plates illustrate the details given on the various subjects indicated.

Although the main facts of the progress of the Austrian expedition in Asia Minor have been from time to time recorded by the European press, yet the details of the sculptures and other objects acquired have only recently been published; in fact (according to the *Hamburger Nachrichten*), only since they have arrived in Vienna, and have been deposited in the museum of that city. The sculptures of Gjölbaschi were described by Schönborn many years ago, that German traveller having visited the spot in 1841; his attention having been specially attracted by a rectangular *peribolos* (measuring twenty-five to thirty paces) with an entrance on the south side. Before Schönborn's time English explorers had been on the spot, and had removed some stones. Their attempts to bring them in an uninjured condition to the sea coast, had, however, proved unsuccessful. Since that time these reliefs would seem to have been left undisturbed until 1881, when Professors Benndorf and Niemann, in company with other *savans*, made a journey of investigation to the spot in question, and found the works still in a good state of preservation. On their return to Vienna they had no difficulty in organising a society for the purpose of raising the funds necessary for obtaining possession of these treasures. The needful *firman* having been granted by the Turkish Government in Constantinople, Professor Benndorf went in April to Gjölbaschi for the second time. The reliefs that he has brought home fill more than 100 cases, and as an illustration of the practical difficulties which have been overcome, it is recorded that the wood for the cases had to be conveyed on the backs of camels to the spot, and that roads had to be made for the subsequent transport of the packages.

Notwithstanding the undoubted artistic interest of the reliefs discovered, it is remarked that their historical application is not at present quite clear. A naval battle, the storming of a fortified city (supposed by Schönborn to represent Troy), and a chase, are described as being amongst the subjects delineated. The hope is expressed that the artistic value of these relics of antiquity may shortly be defined in such a manner that the learned world at large may have an opportunity of becoming acquainted with them, by means of an accurate and intelligent description of their special features.

ARCHITECTURAL EXHIBITION OF THE EDINBURGH ARCHITECTURAL ASSOCIATION.

THE exhibition of drawings and paintings brought together in the rooms of the Royal Scottish Academy under the auspices of the Edinburgh Architectural Association was inaugurated by a *conversazione* on the evening of Friday, the 22nd inst., when the rooms were crowded by a brilliant assemblage. Mr. MacGibbon, the president of the Association, in the course of the evening, delivered a brief address to the assemblage, in which he referred to the cordial support the Association had received, not only from eminent living architects, but from the representatives of others whose earthly course had run, as also by public bodies who were possessed of works suitable for the exhibition. He added that the result had exceeded the expectations of the committee, and referred to the collection which covered the walls of five of the Academy rooms in proof of the success of the undertaking.

The exhibition is, we believe, the first of the kind in Scotland. It contains about 1,200 works, embracing portraits of deceased architects, drawings in colour and monochrome from ancient and modern buildings, designs for buildings completed and for others contemplated, or which were put forward in competitions.

Working drawings form no part of the exhibition. Interesting and instructive as such may be to an expert, they are to the general public a dead language difficult to translate. Almost every architect must have felt how difficult it is to explain his plans to a client, and he must have found that to most a section is an enigma incapable of solution. It is not to be wondered at, therefore, that at the completion of the work he is met with the remark that the result is very different from what was expected.

The drawings exhibited, however, are instructive as well as interesting, showing, as they do, not only the changes which have taken place in taste as regards style, but various modes of representing architectural subjects whether in actual existence or in contemplation.

The simplest mode of treating such is by means of black lines more or less strongly marked, in some instances the openings being filled in with India ink and the mouldings shaded. Then an attempt is made to give a feeling of reality to the elevation by washing it over with burnt sienna and tinting the windows with indigo, adding, perhaps, crimson curtains, a blue sky with white rolling clouds, and sap-green foliage.

Then appears the artistically got-up water-colour perspective, "suffused with a light ne'er seen on land or sea," and finally the vigorous etching, which often displays great power of draughtsmanship, and which is now most highly appreciated. Of the last class of drawings, the most remarkable is the bird's-eye view of the Law Courts by the late Mr. Street, which we take to be the most skilful specimen of draughtsmanship in the rooms. Of the water-colour variety, we single out the competitive designs for St. Mary's Cathedral, Edinburgh, by the late Mr. Burges. Here the interior is bathed in sunshine from floor to ceiling, each detail standing out in bold relief, the massive open-timber ceiling glowing as brightly as the many-tinted stained-glass windows. We look at this design with a loving eye, and cannot help thinking that had it been realised it would have been more interesting and beautiful,—albeit, more strange,—than the more proper and correct work of Sir Gilbert Scott. We have again an opportunity of looking at Sir Gilbert's design, and it occurs to us that in execution the entasis of the central spire has been exaggerated, not with the happiest effect.

A screen is devoted to a series of delicately delineated views in pencil of buildings, chiefly Mediæval, by Mr. MacGibbon, the president; and there are more of a like description by other architects. The system of merely washing in the colour is chiefly followed by the architects of the Classical revival, of which there are excellent examples by Hamilton of Edinburgh, and others.

We shall revert to this exhibition.

THE NEW HOSPITAL AT RUGBY.

ON the 19th inst., "In the faith of Jesus Christ, and for the healing of the sick," the foundation-stone was laid of the Hospital of St. Cross, Mr. Bloxam, Mr. Wilson, and a few others being present, the founders, as we have before mentioned, being Mr. and Mrs. Wood, of that town. A sealed bottle was deposited in a cavity, containing a copy of each of the Rugby papers, a series of silver coins, and the following inscription on vellum,—"In fide Domini Jesu Christi, anno ab incarnatione Domini, MDCCCLXXXII, Die XIX, Mensis Decembris, primum lapidem huius domus Hospitalis Sanctæ Crucis apud Rokeby Ricardus Henricus Wood, Armiger et Elizabetha uxor ejus, Fundatores posuerunt. Hiis testibus Mattheo Holbeche Bloxam, generoso, Henrico Wilson, architecto, cum aliis." A handsome silver trowel was presented by the architect to the foundress. In former days this was not an uncommon name for a hospital, and some of our readers will, no doubt, remember the beautiful Hospital of St. Cross, near Winchester, founded by Bishop Henry de Blois, in 1136, and which still exists for the charitable purpose for which it was founded. The late severe weather has brought building operations to a stand, but they will soon be resumed with renewed vigour. Meanwhile the endowment fund grows apace. One lady, whose name we may not mention, but whose life has been one round of kindness and sympathy to those about her and to her poorer neighbours, has intimated her intention to make a not inconsiderable addition to the fund; whilst another lady, moved by her good example, has promised to contribute the same amount. As we mentioned, Mrs. Hall has most kindly undertaken to obtain 1,000*l.*, and further benefactions will, no doubt, continue to flow in from the charitable throughout the district.

THE LATE MR. ALFRED CROSS, ARCHITECT.

IT is with regret that we have to record the death of Mr. Alfred Cross, of the firm of Cross & Wells, architects and surveyors, Hastings. The deceased gentleman had not been ailing for long, and we have no doubt the announcement of his demise will be a great surprise to many. Mr. Cross was not a native of Hastings, but for the past twenty years he has resided and carried on business in Hastings, and during that time has won for himself many sincere friends. He was born at Bristol, where his father was a contractor in a large way, in 1830, and was thus fifty-two years of age. He was educated at the Royal Naval School at Greenwich, and was afterwards articled to his uncle, a solicitor, in Bristol. He had no love for the law, however, and so he went to London, and entered the office of Mr. J. Shaw, one of the leading architects of the day. Afterwards, he went to the office of Mr. P. Hardwick, R.A. Mr. Cross commenced practice when he was a very young man, his first public building being the well-

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known Ship Hotel at Greenwich. He was, we believe, only twenty-two years of age at the time. A few years later, however, he had to leave London in consequence of his wife's health, and he then came to Hastings. He practised both here and in London for a long time, and in 1872 he became associated with Mr. Wells. Since then the firm has been carried on in the names of Cross & Wells.

Messrs. Cross & Wells were, in conjunction with Messrs. Jeffery & Skiller, the architects for the baths; and they also, in connexion with the same gentlemen, obtained the first premium in the public competition for plans for the new town-hall which it was at one time proposed to erect in Hastings. Messrs. Cross & Wells were also the designers of the Albert Temperance Hotel; and, more recently still, of the new Gaiety Theatre. There are several building estates in the neighbourhood which they have laid out, and they have also been architects for a number of private and business houses. It may be mentioned, further, that Mr. Cross was for some time connected with the Duke of Bedford's estate in London. In Lewisham and the neighbourhood he built several houses. Mr. Cross was an active Freemason.

Most of the members of the profession in Hastings attended the funeral, which took place on Saturday, the 9th of December.

OBITUARY.

The late Mr. Chas. John Dimond.—The members of the Artists' Benevolent Fund amongst others will lament the death of Mr. C. J. Dimond, which took place at his residence, 50, Leinster-gardens, on the 17th inst., at the age of 61. He had suffered for some time from a distressing complaint, but this had been much subdued when an unfortunate chill brought on congestion of the lungs, which caused his death after a few days' illness. Mr. Dimond succeeded his late father as honorary secretary of the Fund, and the success with which he devoted himself to its interest, aided by Mr. Lambton Young, secretary, is shown by the satisfactory position the Institution has attained. Not very long ago Mr. Dimond was deeply gratified by the receipt of a charming collection of drawings by members of the Fund, with folio and stand, in acknowledgment of his life-long labours in its service. He had the advantage of a devoted family, who grieve his loss.

Mr. W. J. Boys.—On the 21st inst., Mr. W. J. Boys, who has been borough surveyor of Walsall for about seventeen years, died very suddenly, at the early age of forty-two. It appears that deceased, who had control of the fire brigade, was excited by an alarm of fire, which proved to be false, and was suddenly taken ill and died in a very short time. Deceased entered the service of the Council under Mr. Clarke, the late borough surveyor, as a boy, and won his way to his position by his own merits. He was one of the most respected and esteemed of the officials in the borough.

GROWTH OF WIMBLEDON: EXTENSION OF THE SEWAGE FARM.

In consequence of the continued increase in the population of Wimbledon, the Local Board have found it necessary to extend the area of the sewage farm, and also to carry out further sanitary improvements. Last week Mr. Arnold Taylor, one of the inspectors of the Local Government Board, held an inquiry at the offices of the Local Board in reference to an application from the Board to sanction the purchase of nine acres of land to extend the sewage farm, and also to borrow 10,500*l.*, of which 6,000*l.* are for works of surface-water drainage; 4,000*l.* for works of private street improvements; and 500*l.* for the erection of cottages at the sewage farm.

Mr. Whitfield, the clerk to the Board, in addressing the inspector on the proposed powers as to the purchase of land, said that the very extraordinary and rapid increase of population in Wimbledon necessitated, and would from time to time necessitate, further provision for the disposal of the sewage of the district. The Local Board had come to the conclusion that it was now necessary for them to acquire further land in the immediate neighbourhood of the present sewage farm. This land was nine acres in extent, and was the property of Mr. Beaumont, a large landowner in the district. The Local Board had naturally been anxious to deal with the matter without troubling the Local Government Board to make a provisional order, but there appeared to be no probability whatever of coming to terms.

It is understood that the provisional order asked for by the Board will almost immediately be issued.

THE ARTISTIC TREATMENT OF EXISTING DOMES AND CUPOLAS.

Sir,—A lengthy essay might be written on the above subject, but, at the present moment, I should merely like to say, if you permit, that I think there appear to be several Renaissance examples by artists of the highest class which justify Mr. Robins's suggested treatment of the dome of St. Paul's Cathedral.

Guido, Correggio, and Cignani have all painted domes, and each selected a subject,—the Assumption of the Virgin,—which the spherical form upon which they were about to work doubtless suggested to them. They appear to have thought that to divide the surface into a number of vertical parts, by means of ribs, would sacrifice the opportunity for a grand and magnificent effect.

As the principle of composition is the same in all three, a brief description of Correggio's, which was executed at Parma between 1520 and 1530, will suffice, and perhaps be acceptable. The painter imagined the drum from which the cupola arises to embrace the earth on which stood the sepulchre of the Virgin. At each of the angles of the octagon rises a candelabrum, with a number of boys engaged in lighting tapers and burning incense. On the base of the cupola stand the twelve Apostles, of heroic size, looking upwards in astonishment, and as if dazzled by the great light of the celestial host who transport the Virgin above. Heaven appears open to receive her. The angel Gabriel descends to meet her, and the different hierarchies of the blessed circle round him. In the pendentives below are the four protectors of Parma,—St. Hilary, St. Bernard, St. John, and St. Thomas, attended by angels symbolical of the virtues of the saint.

The fresco is very spotty from decay, and is otherwise difficult to study, but there are excellent copies in the Pinacotheca, by the late Professor Toschi and his pupils.

May we not consider that in the spherical arrangement,—on the flat,—of Sandro Botticelli's grand picture, recently acquired by the nation, we have this great artist's idea,—in fact, a design by him for the treatment of a dome? In this there are no vertical lines, though it is evident that Botticelli considered symmetry was necessary; for he has placed the front row of figures equi-distant, and made them correspond with one another. Pietro da Orvieto painted spheres, the empyrean and the celestial hierarchies in his allegorical representation of the Creation, in unbroken circles, on the walls of the Campo Santo at Pisa; and the same idea was adopted by Bernardo Luini at Milan.

Does not the fact that Sir Christopher Wren left to the painters of the future a perfectly plain smooth sphere, without any vertical ribs or mouldings, indicate very decidedly that he disapproved of any architectural,—imitative or real,—subdivision of the surface of his dome? Does it not seem to prove that he had seen and admired Correggio's cupola at Parma?

Whether the life of St. Paul would lend itself happily to this mode of treating the dome of our cathedral can easily be determined by the talented men particularly interested in a successful result.

H. De Sivart.

THE NEW "POUHON DE SPA."

It is to the spring called Pouhon that Spa owes its existence. It is, in fact, near to it that an inhabitant of Breda, called Colin Wolf, or Leloup, laid, in the fourteenth century, the foundations of a building on some ground that he had obtained by concession from Adolphe de la Marck, Prince-Bishop of Liège. Other springs were successively discovered, and it is owing to them that the insignificant little village acquired a prosperity that led to the saying, "One sees at Spa Europe in miniature."

The spring in question is situated quite in the middle of the town, and was covered over in 1820 by a building in the form of a pagan temple, erected by the orders of William of Orange in commemoration of the cure of Peter the Great. This portico has been replaced this year by a proper monument, where visitors find a spacious and comfortable pump-room, a vast saloon, a well-lighted promenade, and in the upper part a glass rotunda, a half-circular gallery, and a large estrade for an orchestra; in fact, there is every comfort that can be desired. The edifice designed by the architect, Mr. Besme, and constructed by M. Peret, presents an aspect equally agreeable and imposing.

ENTRANCE HALL TO A HOUSE IN RATISBON.

Many of the old houses in Ratisbon still retain their vaulted entrance-halls. Some of these are beautiful examples of architecture, and date from the thirteenth and fourteenth centuries. The example we give is (or was) in the Goliath Straze: we say "is or *was*," because, when we sketched it, four years back, we were informed that a plan for widening the street had passed the Town Council, and if this plan has been carried out this very interesting house has been "improved" off the face of the earth! This is a great pity, because it was one of the most perfect examples of a fourteenth-century house in Germany. The detail of this hall was rather English-looking.

What was the object of these vaulted entrance-halls, once so common at Ratisbon, it is difficult to say. Some people have supposed that they were the places where the merchants stowed away their goods, and were for that reason vaulted in order to render them fireproof. What seems rather to tell against this theory is the fact that these halls are found in the Street of the Ambassadors, attached to houses which are known to have been inhabited by the nobles of the empire; then, again, the fact of their being almost peculiar to Ratisbon, which never was a commercial city, would lead to the supposition that they were never intended as places for storing goods. They also seem far too handsome for such a purpose. In one house which we saw the hall was divided into a kind of nave and aisles by two rows of columns; and in another the hall, which was used as a circulating library, had thirteenth-century vaulting of a very acute form, with singularly rich bosses at the crossings of the ribs. In another of these halls we found three canopied stone seats, looking very like the sedilia of a church. It is by no means impossible that these halls may have served the same purpose as the halls of our old English mansions, *i.e.*, they may have been used for the meals of the family, which would account for their being treated in such an ornamental manner. Every example which we saw was on the ground-floor. How many of these interesting halls exist in Ratisbon it is impossible to say, but probably they are very numerous, as in two cases we found them existing, although the whole of the rest of the houses had been rebuilt about a century back.

The great rage for "improvement" which has set in in all German towns, will probably in a few years sweep away these interesting structures, and many beautiful features of Mediæval Domestic architecture will have ceased to exist.

THE SACRISTAN'S HOUSE, ST. JAMES'S, ROTHENBURG.

The pretty little dwelling which we illustrate is situated just opposite to the doorway of the great Church of St. James, at Rothenburg. It probably dates from the end of the sixteenth century, as it will be noticed that, although the traceried panel under the window is quite Gothic in character, there is some thoroughly Renaissance panelling between the window and the doorway.

The mullions of the windows are of wood, and the original glazing, which still remains, adds greatly to the picturesque appearance of the building. From the very solid way in which the basement is constructed, we are inclined to think that it was intended to support a much more lofty structure than that which at present exists; probably, also, the window is rather later in date than the other part of the work.

We have, in previous volumes, given illustrations of the Church of St. James and other buildings in this most interesting old town.

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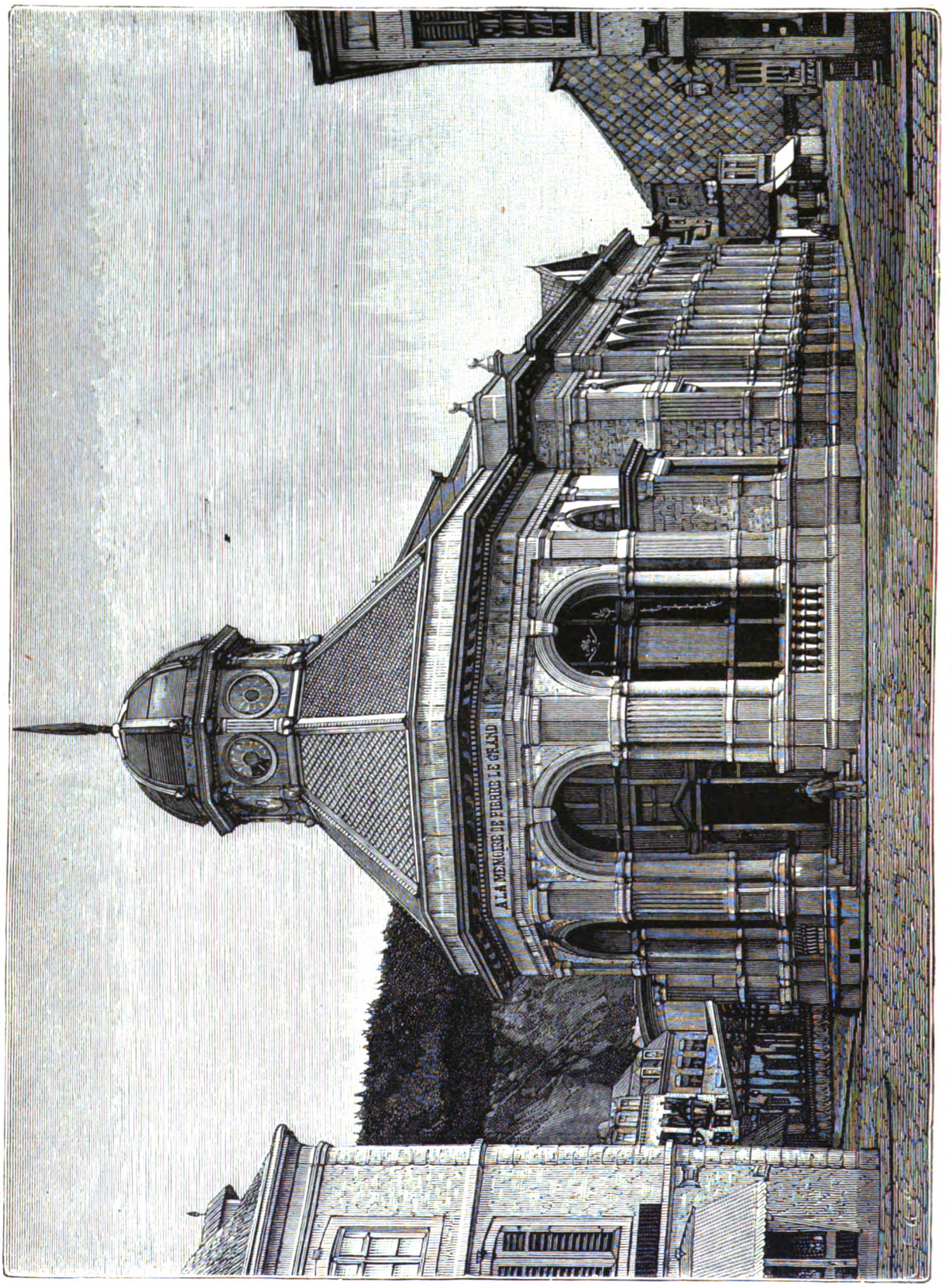

THE NEW POUHON AT SPA.—M. Besme, Architect.

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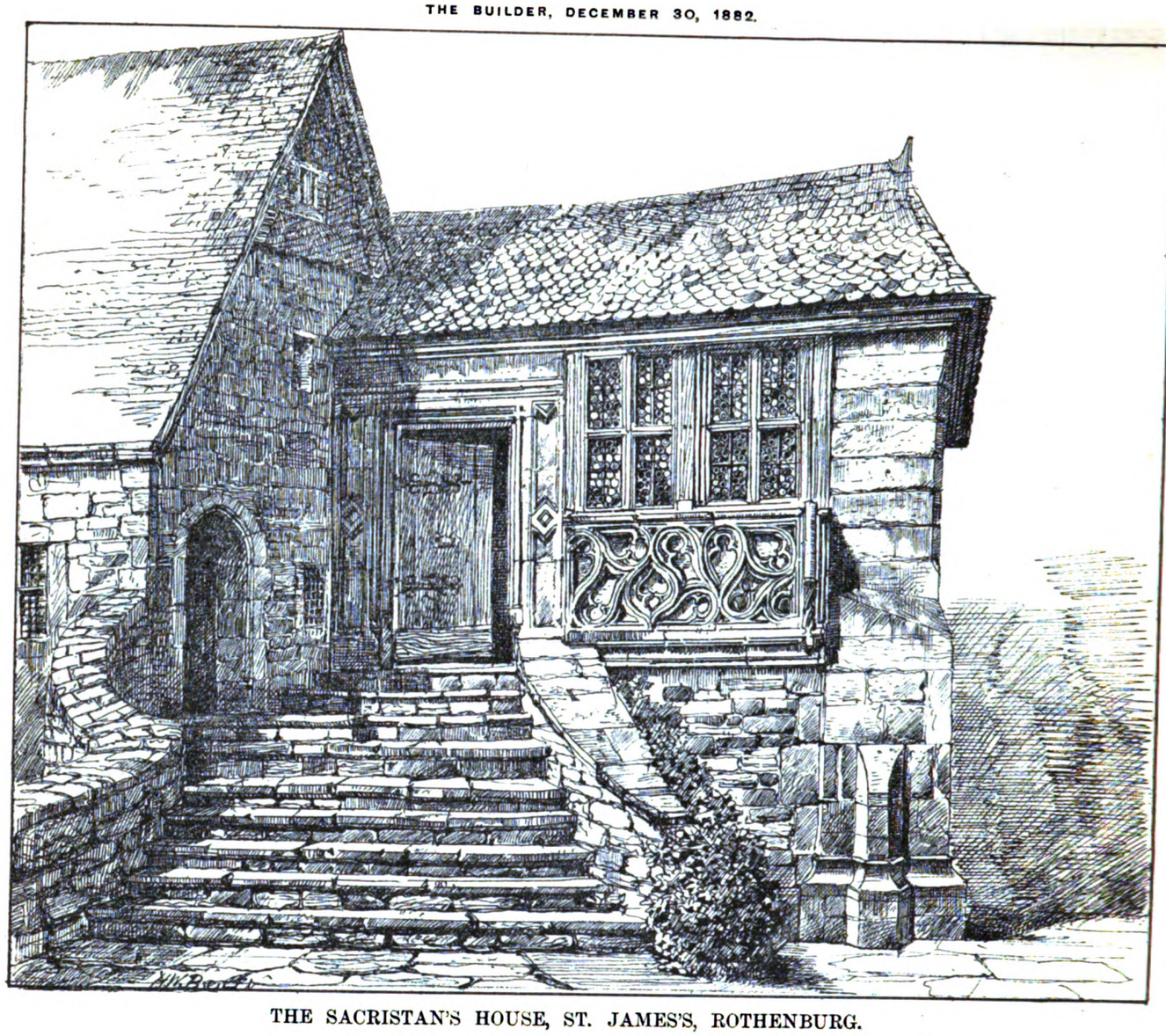
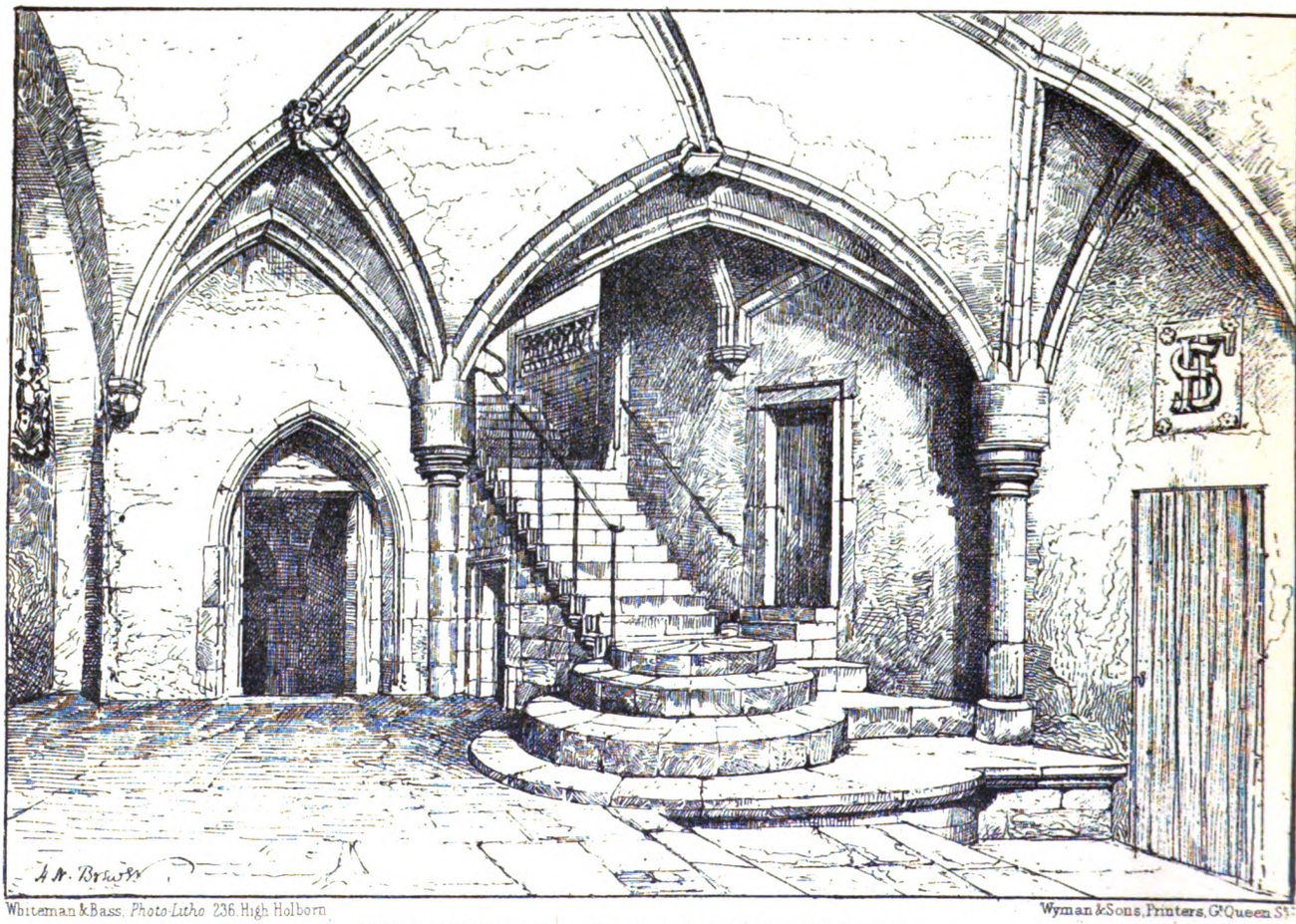


THE SACRISTAN'S HOUSE, ST. JAMES'S, ROTHENBURG.



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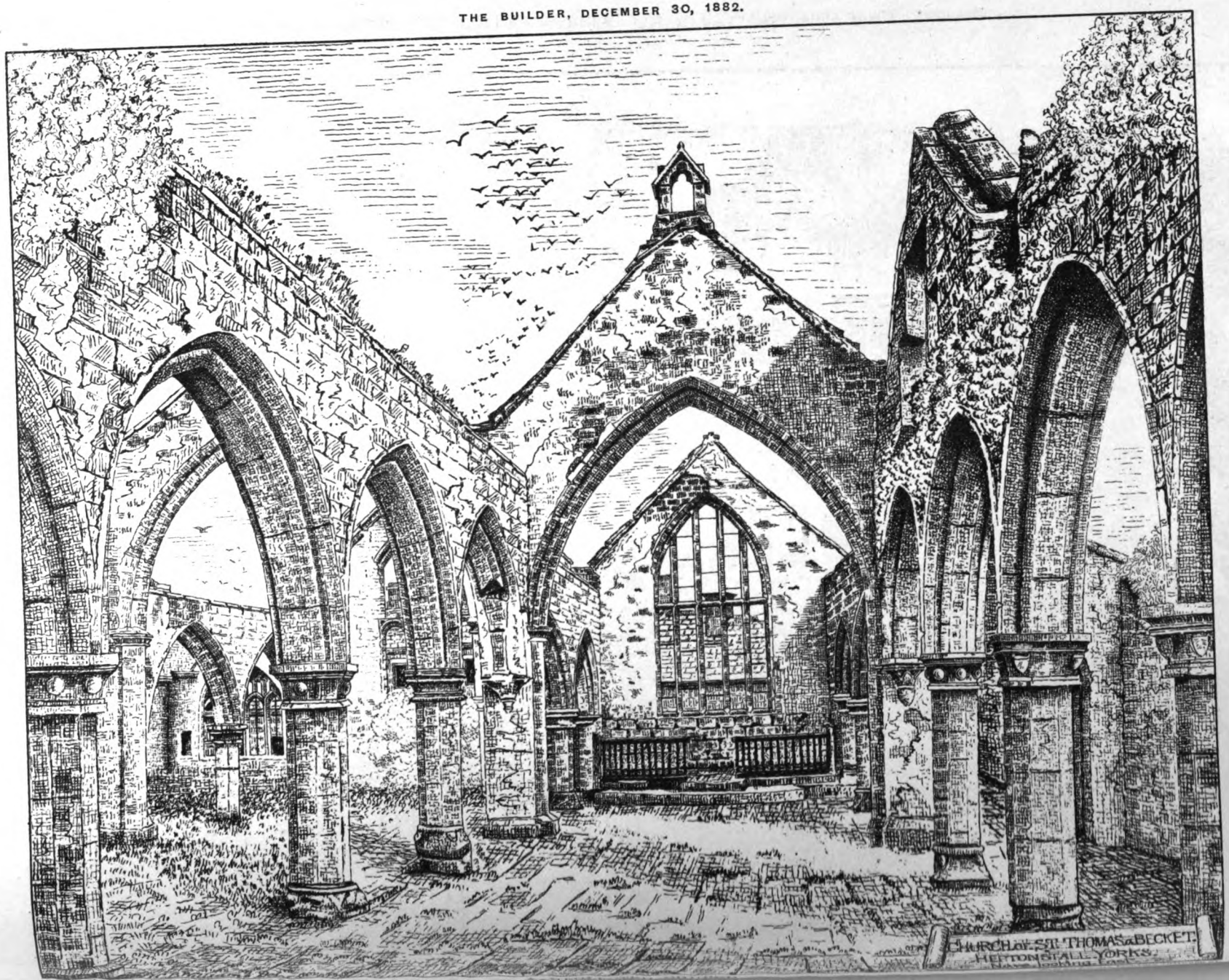

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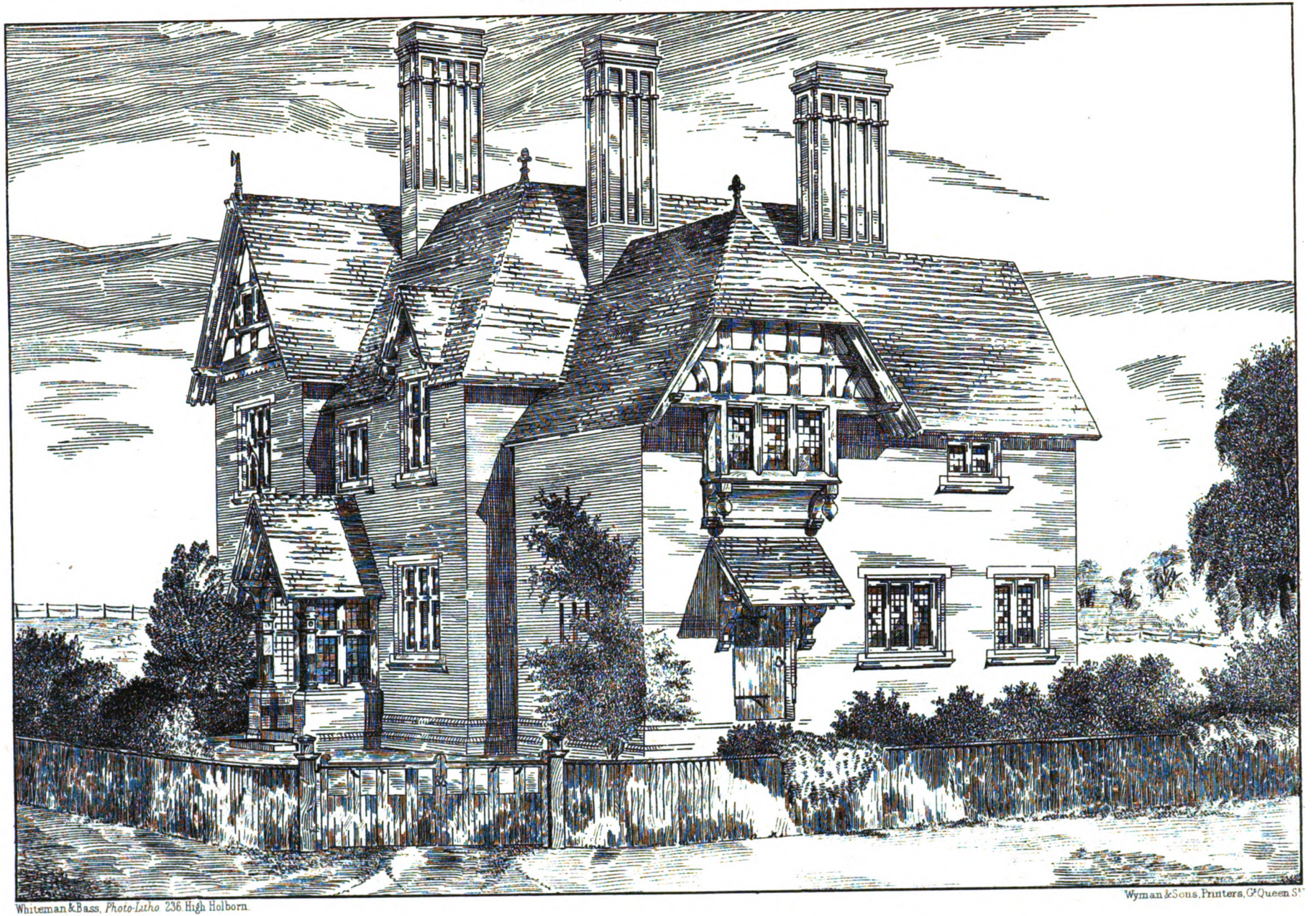

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COUNTRY RESIDENCE: GOLDER'S GREEN, FINCHLEY.—Mr. John Birch, Architect.

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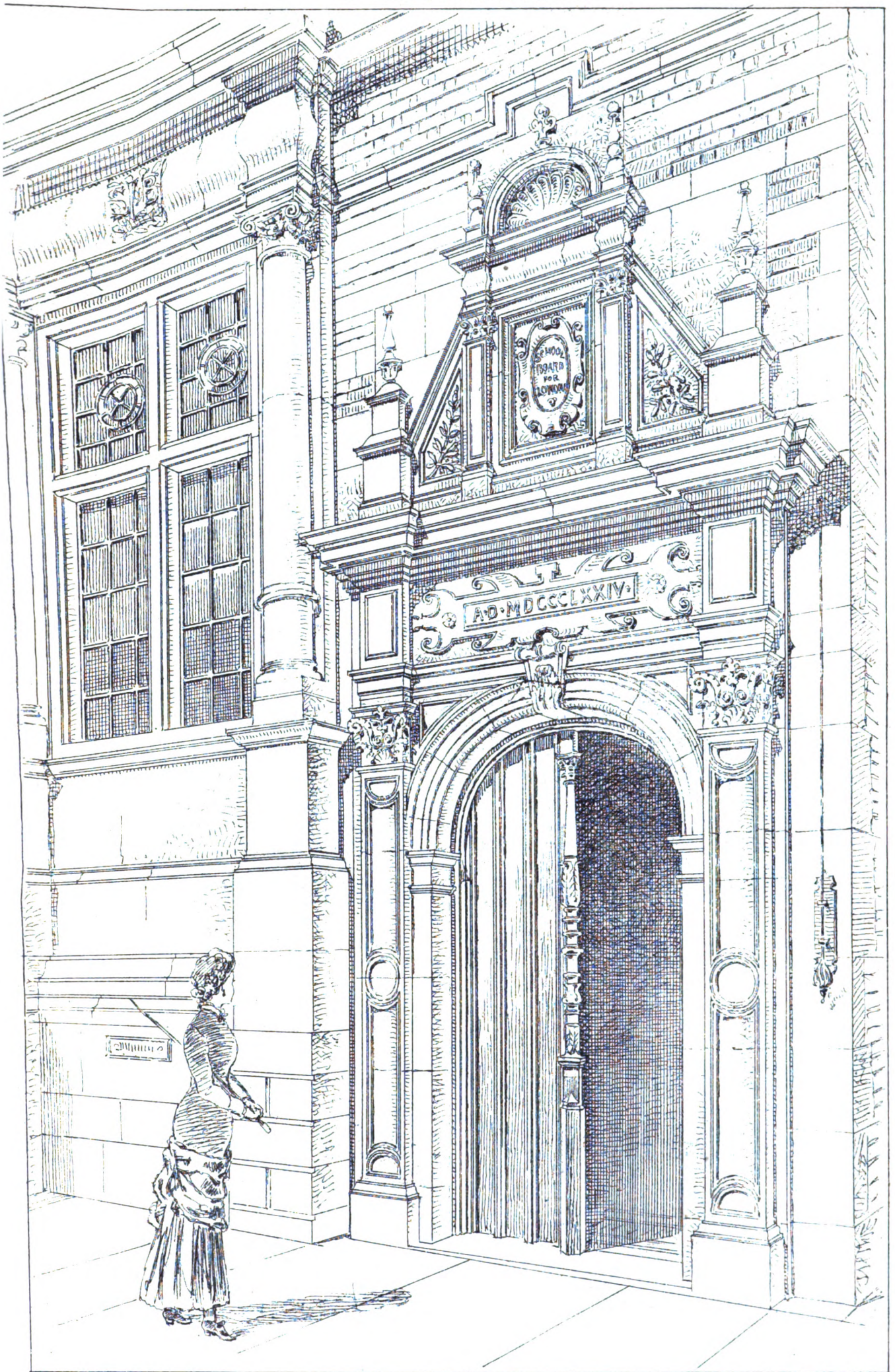

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DOORWAY, LONDON SCHOOL BOARD OFFICES, VICTORIA EMBANKMENT.—MESSRS. BODLEY & GARNER, ARCHITECTS.

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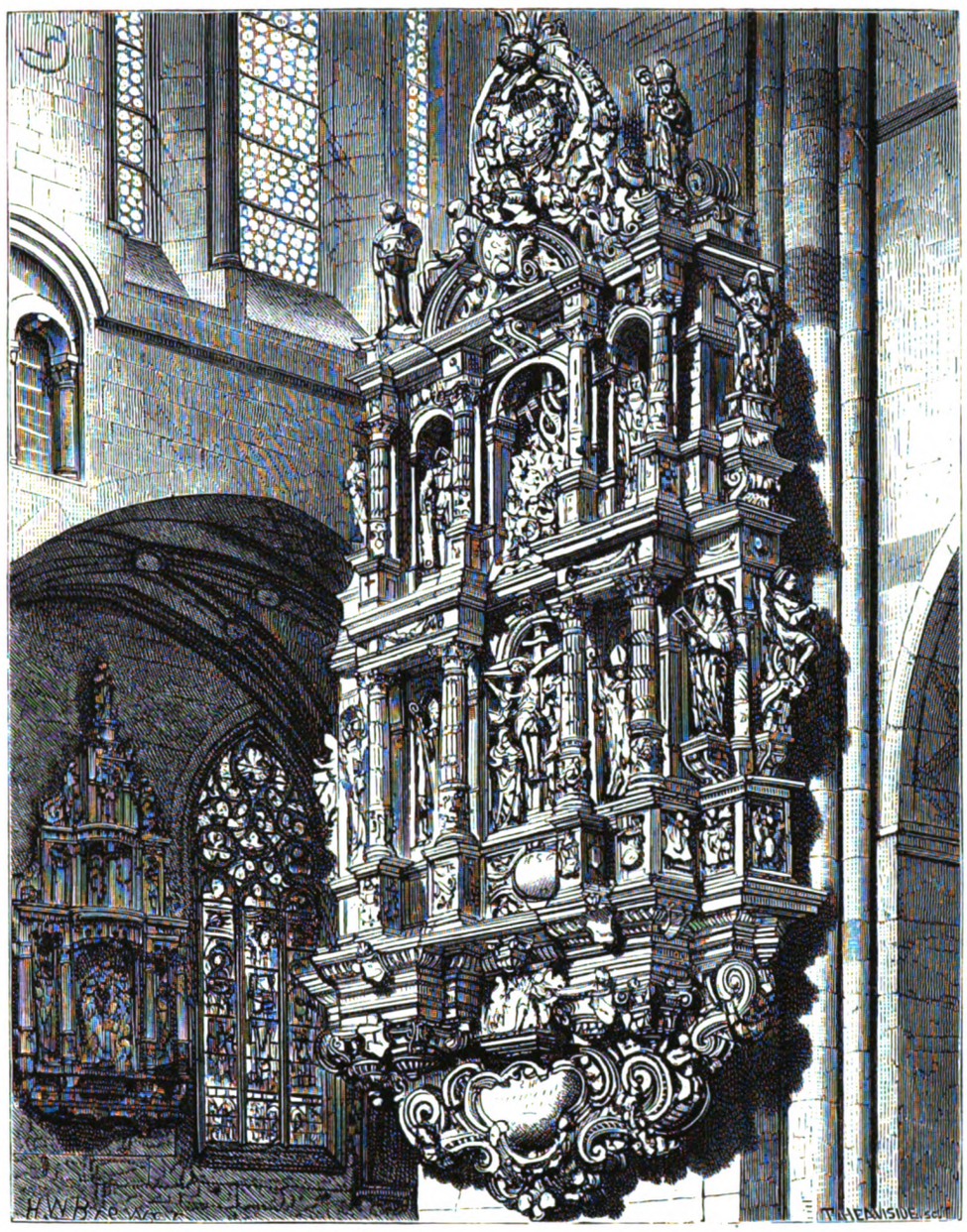

MONUMENT FROM THE CATHEDRAL IN BREDA, HOLLAND: SIXTEENTH CENTURY.

COUNTRY RESIDENCE, GOLDER'S GREEN, FINCHLEY.

THIS residence has just been completed under the direction of Mr. John Birch, John-street, Adelphi. Considerable difficulty was experienced in finding a firm foundation, owing to the nature of the ground, but this was overcome by a judicious use of concrete. The walls are carried up of red brick, and pointed with a black mortar joint, and the roofs are covered with red tiles laid upon boarding.

The principal rooms are on the ground-floor, and disposed towards the south and west, and consist of dining, drawing, and morning rooms, with low windows opening on to a lawn; the entrance-hall, offices, and servants' wing are towards the north and east.

A projecting porch, glazed with lead lights, encloses the front entrance, and the tradesmen's entrance adjoins the road.

The first-floor contains six bedrooms, dressing-room, and bath-room, with other necessaries, and above the floor are two attics and a box-room.

The internal fittings throughout are of yellow deal, and the floors are partly deal, oak parquet, and pitch-pine.

Special attention, it is said, has been given to the drainage and ventilation of the building.

Messrs. Bodley & Garner were the architects.

Great care has been taken to reproduce the features of that period of the past chosen for revival. The style is the style *par excellence* for joinery, and certainly there is this to be said in favour of its resurrection,—that this elaborate introduction of joinery lends itself well to the making-up of a comfortable structure.

HEPTONSTALL OLD CHURCH, YORKS.

THIS venerable ruin is situate on the summit of a commanding eminence, in a district noted for its picturesque beauty. It dates from the thirteenth century, and was originally dedicated to St. Thomas of Canterbury. A few years ago the edifice, being considered in a dangerous condition, was unroofed, and a new church was erected on the adjoining site.

Since the drawing was made, a portion of the south aisle wall has fallen down, and the tower will doubtless ere long share the same fate, a great mass of masonry having fallen out at one of the angles. It is to be regretted that so fine a specimen of a double-naved church should become so absolutely a prey to the ravages of time.

A. W.

THE DOORWAY OF THE LONDON SCHOOL BOARD OFFICES.

THIS is the entrance to a modern building, which has much in it deserving of study; especially by those visitors to our metropolis having a taste for the pleasant pastime of reflecting philosophically on the ebbings and flowings of architectural taste in our day.

MONUMENT AT BREDA.

THE beautiful but sadly neglected old cathedral at Breda, in Holland, is rich in monuments of every description. The brass font, the choir-stalls, and the noble monument of the Nassau family have been already illustrated in this journal, and we now add a drawing of a very remarkable example of a mural tablet monument. This work is interesting, as showing the thoroughly Italian character which the Renaissance assumed in some parts of Holland.

When we say that these monuments are Italian in character, we must not be understood to suggest that they are the work of either Italian architects or workmen. The dates of their erection would preclude the possibility of their being so. The monument now given dates from the year 1536, and is to the memory of the Count de Bourneval.

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THE FOUNDATIONS OF ART IN ARCHITECTURE.*

II. INTENTION.

TURNING to the next fundamental principle, I find its absence to be the root and cause of so much bad architecture, — viz., "*Intention*." In all walks of life "good intentions" are slightingly spoken of as implying the want of any clear and decisive intent. We are even told of a place, far beneath our ken, significantly paved with some peculiar tesserœ of irresolution. Here is a pivot on which much must turn. Have we no clear light for our future work? Then are we groping, and our buildings are either borrowed from the minds of others, or bear the marks of infirm purpose. In modern architecture, want of intention can easily be identified. Buildings which neither fit their purpose, express their use architecturally, nor give pleasure to the beholder. Buildings formed neither to educate, to amuse, nor to adorn. Composition, grouping, massing, proportion, and general result, all at haphazard or by mere accident. Detail, so far as detail can give expression to a definite, real design, unmeaning as the monkey's chatter. A prevailing sense of stupidity and uninterest. An air of struggle in some cases equally aimless and resultless. The greater the visible struggle, of course (as in all art matters) the greater the failure. This presence of apparent effort in the designs of modern buildings is always one of the worst symptoms, and calls to one's mind the fable of the frog and the bull. It tells of ignorance, vanity, irresolution, and want of power. He who works in fullest truth, without pride and with simple aims, works naturally. He who knows and loves his art works easily, with much suggestiveness of pleasant inner thought and of more pleasant things to say by-and-by. Though aware that the highest art is that which conceals art, no architect (if he happen to be an artist) can help revealing his mind in his work. These idiosyncrasies, indeed, form part of the pleasure to be found in it. But, when he indulges further in all kinds of personal conceits and self-glorifications, his peculiarities become more objectionable than in private life, for in architecture they are indulged in to the misery of mankind at large; and we see the absence of Intention.

In beholding the finest buildings, we think least of their architects. Our joy is more akin to that which we feel at the sight of a glorious landscape; and the less we obtrude self in our own work, the better the work will assuredly be, as having been studied and produced for its own sake, and been a sharer in our own delight. Modern personal literature is bad enough; the architectural degeneracy which causes people to inscribe noisily on their buildings "Smith," or "Brown," or "Jones," is worse. The greater historical knowledge of architecture, arising from the increase in the number of books and the invention of photography, has undoubtedly increased our want of right "Intention." It has given rise to more and more downright copyism, some clumsy adaptation, and a serious amount of architectural muddle in building. Rightly used, books and photographs ought to produce a greater consensus of knowledge, and should enable men to think more freshly and design more freely. Mere "eclectic" building, however clever, only renders more conspicuous the absence of the designing and creating power, and the want of a clear artistic intention. On the other hand, when we come to look attentively at really good architecture,—I leave you to choose the country, the period, and the building,—there is no vagueness, no indecision, no doing of things by accident, no drifting helplessly from one idea to another. The artist first grasped his building comprehensively as a whole, with a clear definite intention of what he meant to say; he then proceeded to say it; and he conveyed his very meaning and purpose on the face of his work, every moulding and member, window and door architrave, cornice and sculpture, being, in his hands, so many opportunities for proclaiming his Intention. If you wish to produce and intend to produce good art, you must endeavour to understand, first of all, that you will never get paid for it. The pleasure you have had in it must be, to yourself, all the reward you will ever receive. You will, of course, be paid your percentage calculated on the sum which the builder has received for his part of the work; but you will receive this all the same if you work with the mind of the tee-square and compasses, and not in the spirit of the artist. The art in your work depends wholly upon the pleasure you have taken in it, and has no market value.

When, in the year 1270, Cimabüé, uniting the idealism of the old Greek with the poetry of human life in a religious picture, painted his celebrated Madonna, now in the Church of Santa Maria Novella at Florence, the whole populace rose in triumph at the revelation; the picture was carried in procession to the church, and the street in which the painter lived was called ever after "The Joyful Quarter" (*Borgo Allegri*). These were times when an enthusiastic people were enthusiastic about art. Our public, on the contrary, judge it all by the standard of £. s. d. Fancy the design for the Albert Memorial or the Griffin carried in state through London, or the designs of your Cloth Hall paraded down Briggate!

It is, in spite of public apathy and ignorance, that you have now to work and think. Your deliberate "Intention," therefore, is by no means a trivial matter, and can only come from such inner light as you may yourselves have. Suppose you change places for a moment, and form one of the public looking at a new building. The first question you have to ask is, "What did that man mean?" Until you have answered it, all criticism must be vain. Often you will be disappointed, and find that nothing of good was carefully and deliberately intended. When you recognise true intention, you will always find more and more interest in the building, though you may not find, as our friend the dictionary-maker would expect, that the design is "referable to some model," or copies the silly fashions of the day. This change of places may perhaps bring vividly to your minds the immense difficulty of forming true architectural intention. It presupposes a long hard course of study, extending over many years (for no man is an architect under forty), and a ripe judgment. You may ask what that course of study should be. Beyond the usual course of study, I should say, "Study the works of Christian times, when faith was simple." Ponder your Greek by all means, though the work of heathens; no people are more clear in their intentions or more perfect in their works. Then study Christian art while the faith was young. Skill is less; intention quite as clear; suggestiveness everywhere. Go to St. Trophimus at Arles, to St. Ambrogio at Milan; Trent, Spàlato, and Ancona will each repay you; drink in the history, antiquities, and mosaic pictures of that stranded city of the sea,—the unique Ravenna; and see what may be yet left of St. Mark's at Venice. We are apt to be blinded, or at least dazzled, by the splendours of the Renaissance in Italy, and I should be the last to say that they have nothing to teach of architecture; yet, judged by our somewhat severe test, we may, on the whole, be content to leave them all to the painters and sculptors. Painting and sculpture then attained to a high pinnacle in skill of execution. In point of fact, we have more of fine art in architecture to learn from the Greeks, and more of single-minded clear intention from the early Christians, who, like Cimabüé, attempted in their way to combine the two.

If I wished to instance, perhaps, the noblest examples of clear high-souled intention, I should point to the frescoes, paintings, and architecture of Giotto, at Florence. These will merit and repay any amount of careful study. What they all meant in those days by the cavernous ugliness of the interior of their cathedral, reserving their most splendid marble and decorations for the outside, nor why they allowed Brunelleschi, after the death of Giotto, to exhibit his mere cleverness in construction by planting a dome on the crossing for which the building was never designed, I will not pretend to say.* But the pride of the Florentines of that day is surely the key; and, if we look to the instructions given to Giotto about the Campanile, we read it plainly. He was "to construct an edifice which, in height and in richness of workmanship, should surpass any structure raised by the Greeks or Romans in the most palmy days of their power." But Giotto happened to be a true artist; he happened to possess some of the divine afflatus without which there is no art; and he made his work all that, and much more. I do not praise Giotto because in his works he constantly preaches the truths of the Christian religion. After all that has been said on the subject, I do not feel sure that he considered it any part of his business to teach religion at all. We only know that his clear, vivid perceptions are never dimmed by any doubts about the doctrines of the church; and, having poetry in his soul, he set himself to represent, in a true poetic spirit, both in painting and sculpture, the prevailing beliefs of the time. In his Campanile at Florence, the result of his "Intention" is form, proportion, and colour of the finest,—sculpture of the noblest, most interesting, and most instructive. No tower and no building in the world brings home to one's mind so clearly Schlegel's description of architecture as "frozen music."

III. RIGIDITY.

In ordinary language, as you all know, rigidity means merely stiffness or want of pliability, and in connexion with building it might at first seem to allude only to the material quality of strength. In the arts, however, the word signifies something more than the starch to your shirt-collar. It has a meaning distinct from that in common vogue, and is used to express a particular æsthetic quality or value opposed to easy softness, incoherence, or languid beauty, and having for a result the stamping of the work with vigorous character. We recognise it in fine sculpture constantly, especially where it suggests imminent or actual action of the figures. To carve men and animals in marble at the moment of action or impending action was always the sculptor's highest aim in the time of Pericles. When they succeeded, as they often did, the test was rigidity, with often an admirable choice of the decisive moment. What we admire in the Elgin marbles, after satisfying our minds as to the action of the horses, the grouping, &c., is this subtle quality of rigidity, involving choice of moment. Do not be led away by the notion that good sculpture requires the portrayal of actual action. The suggestion of some impending action is often better, for, in all the arts, works which do not suggest something more are always the dullest. Thus, when Michelangelo stood, as is related, before Donatello's St. George (which is equally poised on both legs behind his shield) and, after studying it for some time, exclaimed "March!" it was the quality of rigidity and suggested movement which excited the admiration of the great master. The "Wrestlers" and the "Knife-whetter" of the Uffizi, both in vigorous action, have it. But so also has the immortal Venus of Milo in every line, despite its comparative repose. In architecture we have no other word to express exactly the same artistic quality. If we know anything, we unconsciously know it when present. It is a kind of backbone. And, if I were asked to define the precise quality in which the best work of my friend, the late Mr. Street, excelled, I should say "Rigidity." I should hold the same with regard to the works of the late Mr. Thomson, of Glasgow.

Let us see whether we can learn anything from the sculptor and this element of his work. Now sculpture is the art of graving or cutting hard materials,—so far as we are at present concerned,—hard marbles. In all the best times of sculpture only the hardest marbles were used, such as would bear the finest incising in the flat, or the utmost finish in the round. Witness any fine old Greek statue, or study the tombs in the floor of Santa Croce. It has been reserved for degenerate Pisans and Florentines to produce every year thousands of worthless copies of fine things in the softest marbles of Carrara, easily sold to the Cockneys of all nations.

The great period of Greek sculpture may be said to have begun with the birth of Phidias in 484 B.C. It is instructive to note in passing, that not only did all kinds of artists and artificers work under the orders of Phidias, but also the architects. In his hands, figures are always draped with studied grace, lofty purity of intention is never forgotten, and the subtle element of rigidity is never lost. Others were led away by the pursuit of mere beauty, first by showing the whole female form through closely clinging draperies, and then (as by Praxiteles) entirely nude. This led soon to the expression of sensual beauty, and Greek art step by step declined. Truth, purity of intention, both gone, a sure degradation set in, till in the later Greek,

* An address delivered before the Leeds Architectural Society by Mr. Edward Robert Robson, F.S.A., December 4, 1882. See p. 806, *ante*.

* I am well aware that Michaelangelo greatly admired this dome, and made it the foundation of his dome at St. Peter's. This would naturally be so in an age of little constructive knowledge, and a delight in mere "*tours de force*," so common in the times of the Renaissance.

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and the Roman done by Greek hands, we forget even to look for rigidity.

Our buildings must ever be treated as wholes, to be seen from every side with a sense of unity, just as sculptors treat their subjects. No ostentatious fronts of stone and shabby backs of bricks. Even, indeed, when wedged between others in a street more closely than the statue in its niche, the stone and the brick must receive equal attention. Just as the best sculptors of old selected the best materials in their neighbourhood, the hardest marbles, difficult and laborious to work, but able to carry well the imprint of art, so we in our buildings must not use the badly-made or burned brick, the stones unfit for our climate or laid in improper positions, the unseasoned timber, or the thousand other bad things which, in this ingenious age, are thrust upon us.

I have already endeavoured to point out how Truth must always be your basis, and Intention, clear, definite, and always pressing upward, should guide you artistically in all your works. This third principle should form the natural result. When you have achieved a noble work in which rigidity is present without struggle, repose without inanity, and the more usual qualities of architecture are not violated, you may know that your building will give pleasure or instruction to others. On the contrary, the absence of rigidity will mark it as a dull uninteresting one. In a word, if you wish to ascertain whether you have any real perceptions of art in architecture, you may measure yourselves up by seeing whether you can judge of its presence or absence in buildings.

I do not say that the principles I am laying down are the only ones needed, or that their practice will give the artistic power of creation to him who has it not. But they form leading elements easily remembered. They will bring independent thinking, thinking with knowledge, and will help our emancipation from the monkey-like habit of imitation, the modern curse. A little honest thought of them would have rendered impossible the "battle of the styles" which raged a few years since. That battle was waged by every one who took part in it on the unconscious assumption that, in the nineteenth century, English architects could do no more than imitate the art of some past time, formed for another age, and perhaps grown in a different climate and country. If a man be working honestly and truthfully, he need not fear conflicting styles. He is not hard at work copying the productions of deceased artists. He has learned, or is learning, that to do fine work he must maintain a lofty ideal. He takes a great and real pleasure in his labour, which is itself the surest way to stamp his productions with the Hall-mark of art.

It is not given to every man to be an inventive or creative genius. Such a man as Leonardo da Vinci is only possible when the universal impulse and struggle of the time acts upon a man of rare gifts, intuitions, and deep knowledge. Rules are necessary in architecture, as in the sister arts, and can never be abolished without loss. Yet their observance without thought, or without a knowledge of the bases on which they were founded, can only be at best a superstition. Rules may be said to formulate the accumulated wisdom of generations of artists who have preceded us. In regard to what may generally be styled Classic architecture in England, the slavish following of rules gradually became, in the later years of the last century, the ruin of the very thing they were intended to sustain. By a strict adherence to the letter only, the spirit of academic rules was gradually lost, new buildings wore a certain air of artificiality, they ceased to speak as man to man, or to give pleasure, and the evil increased step by step till it reached the blank respectability to be found in Gower-street, and the solemn inanity of the Cannon-row Civil Service building. But for this decadence, and the inevitable striving after novelty, it is fair to assume that the Gothic revival, which the nineteenth century has lately seen, would have been confined to church building. So far as its constructive teaching went, it did noble work, and has laid the foundation for further progress. So far as it copied the language of a warlike age, and taught the sermons of a monkish life, it was out of harmony with the time. In this sense, our Palace of Justice, noble as it is, is an anachronism, or at least records the awakening half-knowledge of the time.

Creative art can never be produced by rules, however necessary. We cannot always be repeating the wisdom of the ancients. Even Shakspeare may be quoted too often, and the Bible itself degraded by misuse to an ignorant fetish. Times change. New wants of the time arise. The artistic perceptions in relation thereto grow clearer. There is no rule without an exception. And he who has passed into the inner sanctuary behind architectural rules and canons may sometimes break them with advantage. This advantage can never lie with the ignorant. With him "what is new is not true, and what is true is not new." With him originality is but another name for bad architecture. You may know all about architecture and construction, may be splendid draughtsmen, even able, like the old Greeks, to portray the human figure in action, and yet fail to be architects in the one great sense which, rightly understood, is the only sense. When you are worthy exponents of "*truth in the treatment of material*," when a clear, vigorous, and decided "*intention*" marks every movement of your pencil, then I may safely leave you to the study of the higher things of architecture. Possibly your buildings may come to be as full of rigid life as the Elgin marbles, and we may discover the presence of that little spark of the divine afflatus which indicates true poetic art, and which, all the world over, and in all time, marks out clearly and plainly, to all who can see, the difference between building and architecture, between him whose eyes are opened to art and him from whom the scales have not yet dropped.

I ought, I think, to give some examples of rigidity in architecture. It is no new-fashioned thing brought down fresh from London. You may find it all over Europe, and easily in any of your own Yorkshire abbeys. English works of the twelfth and thirteenth centuries never lack it. When we come to flowing tracery, the pursuit of mere beauty sometimes dimmed it, and in the Perpendicular work of Somersetshire it still survived.

In Italy the study of architecture must ever be pursued from a different standpoint, yet I am content to judge it by this test of rigidity. There, after the early Christian art, I greatly prefer the architecture of the twelfth century to that of the thirteenth. This, not from any preference on my part for the round arch over the pointed, but because of the greater amusement and instruction derived from the work, and because it is the suggestive point after which, to my mind, architecture in Italy went astray. This west front (or what in England would be the west front) of the cathedral of Lucca, of which I have here some large photographs, is a good illustration. I select it chiefly because it is something you may not have seen. First notice the amount and manner of the stilting to the arches. The three larger arches of the lowest story are round, that on the right hand being considerably smaller, a difference so cleverly masked as to be far more apparent on the photograph than on the building itself. Then, observe the treatment of the various orders of the arch. They are narrower at the springing, and much wider at the crown. The round arch of the opening becomes embraced in the either elliptical, or (as my own opinion inclines), hand-drawn forms of its outer orders. What would otherwise be great clumsiness just above the capitals is entirely avoided; and a singularly beautiful effect in expressive rigidity is attained. The side walls of the church of Early Gothic lose the treatment altogether, and are lifeless and uninteresting by comparison. I commend to your notice this union of the circle and ellipse, especially when the aid of splendid sculpture can be obtained. I commend also to your attention the especial sculpture of this façade at Lucca. Photographs can never do justice to the loving thought or the lavished labour to be found all over it, in capitals, columns, and, indeed, everywhere else. I should unhesitatingly pronounce the building to be the design of a sculptor, if it were not characterised by so many of the higher and rarer qualities of architecture. Can it be that it was, after all, designed by a sculptor, and that his knowledge of rigidity in sculpture led to freer handling in architecture? I leave you to settle this for yourselves. One thing I know, viz., that if you wish to discard style and copyism, and to produce real work of your own, you may find all the necessary principles, including the proper union of sculpture with architecture, at Lucca. When you wish to study only form and proportion, you can study the Greek; when you go to colour you must go to Giotto, who settled the school of colour for all Italy and the world. When you want to look at a fine church interior in Italy you may hie to Florence and St. Croce. And when you want to fathom rigidity you may wind up at Lucca. Like charity among the virtues, this quality is in architecture the last, the greatest, and the rarest. There are some other photographs here of about the same time, chiefly doorways of churches at Lucca and the neighbouring towns. And, in Italy, the work of this period all shows the use of the stilt, and of the circle within the ellipse. In the later times of the round arch it disappears. Then comes the Italian method of giving pointed arches from different centres, a period when in Italy sculpture stood far higher than architecture, and when the best works therein were done by painters and sculptors.

In conclusion, I would point out that spasmodic effort must always, in the nature of things, fail to produce new and living kind in architecture. If in the past architecture has faithfully recorded history, so must it in the future, if there be worthy architects to bear their part, and honest workmen to carry out. And the future of architecture concerns every man. We have entered upon a period of English history when the wants of the many have for ever superseded the luxuries of the few in the aims and efforts of men. The old governments by despots and priests are gone; let us beware that they are not replaced among the people by governments of the ignorant. The age of costly luxury, which threatened the health of Old England, as it terminated the career of old Rome, is probably passing away. Few among us here will be called upon to build cathedrals or palaces, or any works other than those which spring from peaceful industry and pleasant life. Let us see that the aims of newly-enfranchised masses are directed towards the arts of peace. There is work for all in this direction, and architecture must have its place. The future time will tell whether the present has its architects able truly to write history on the wall. The palmy days of Greece contrasted the perfect beauty of the Temple in its noblest architecture with the hovel of the peasant in its lowest squalor. In this England of ours to-day, power is passing from the *noblesse* to the masses. Art, if any is to be left at all, must belong to the people, and form part of the people, powerfully influencing by its universality their homes and lives. If once this be the case, we may be content to let the costly finery and oppressive ugliness which mark the "drawing-rooms" of the middle classes die a natural death. The mission of the architect is no longer to give expression to extravagance; to the insolence of caste, on the one hand, or of ignorance on the other, but rather to educate by the truthful, intentional, rigid houses of the poor, and to ally honest, substantial art to simple wants. If, in the immediate future, architecture is to be more than a merely curious and interesting form of past history, it must enter largely into the lives of the masses, must rear and decorate their simple homes. He who most truly reads this is most in harmony with the spirit of the age. He who succeeds best, and without affectation, in producing simple artistic work fit for the humbler domestic life in England, does most to discredit the modern shams and petty pretty trumpery which beset us on all sides, and best paves the way for a new era in English architecture, in English life, and in English greatness.

Thirty years ago the writings of Mr. Ruskin first called attention to the decay of the arts in Europe generally. His voice was the trumpet-blast which called upon men to neglect the false and follow the true. He tore to tatters the pratings of pedants, lifted the wheels out of their ancient ruts, and prepared the road for those about to enter on the journey. Above all, he taught us that the degradation of art begins exactly where the use of machine-made ornament begins. From that day to this every single architect who has produced a fine building owes its high quality (if he will but confess his indebtedness) to Mr. Ruskin's teaching. On the other hand, at no period in the history of England has there been let loose so villainous a flood of cast-brick, terra-cotta, &c., to the degradation of honest building. Now, if I have not led you into architectural technicalities, neither am I about to discuss theories, some of which, it may be, Mr. Ruskin does not now himself hold. I cannot fail to see that in these

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days no writer on art neglects at some point or other to quote this great authority.

Architects alone do not, and profess to regard him as an amateur. Let us admit that fact, and yet learn from him. To his words modern architecture, I maintain, owes what little of artistic life it has. It is not necessary to take sides on the relative value of Northern and Southern Gothic, nor to agree in the utter condemnation of such buildings as Sansovino's Library at Venice. Mr. Ruskin does far more for us. We wish to see more vitality in architecture. He takes us with the most winning and musical language to Nature as our teacher. We desire a new style of architecture which shall fitly represent the spirit of the age and the wants of the time. He discusses fundamental laws which set us all thinking, thinking, thinking, yet narrows not our liberty, but leaves us to fashion our works as we ourselves may think best. We wish to know, in broad sense, the precise position and prospects of architecture now as compared with the old days of cathedrals and palaces. His living words bearing on this you may all read. They are as true now as thirty years ago. And they would be specially instructive to architects in their daily work if they would keep them in mind.

Architects read Mr. Ruskin only as an amusement, or because of his fine language and glowing periods: they revel in the colouring of the word-painter, but disdain the lessons of the teacher. They dislike him because he has an unpleasant way of plunging them out of their depth on the subject which they regard as their own. They shudder at his disrespect towards Vitruvius, Palladio, and the T-square, and at his refusal to accept the Gold Medal of the Royal Institute of British Architects; and they hold up their hands in horror at a man who has said that all good design must come from the workman. For all that, he it is who has awakened England to the dawn of a brighter day, and to whom all architects owe a deep debt of gratitude. He has much to teach. If what I have said lead to a deeper and closer study of his mind, I shall not have visited Leeds in vain.

ARCHITECTURAL SOCIETIES.

Edinburgh Architectural Association.—At a meeting of this Association, on the 21st inst., Mr. M'Gibbon, who presided, reported upon the preparations for the architectural exhibition, elsewhere noticed. He said that, while they had expected to fill three rooms with exhibits, in point of fact they had filled the whole available space, and had been obliged besides to reject some works for lack of room. A paper by Mr. Andrew Kerr on "George Kemp" was communicated by Mr. M'Lachlan. Kemp's career was traced from the cradle to the grave, and an interesting description given of his connexion with the proposed restoration of Glasgow Cathedral, together with the particulars of the competition for the Scott Monument, when success crowned the design of the unknown "John Moroo." It was also shown that Kemp secured his position by dint of study, hard work, and perseverance, and in evidence of this an interesting portfolio of his drawings was exhibited.

York Architectural Association.—A meeting of this society took place on the 21st inst. in the Saloon, Victoria Hall, Goodramgate. There was a large attendance of members to hear the first of a series of papers, contributed by members of the association, bearing upon the art and science of architecture, read by Mr. J. Perry, on the "Present Aspect of Architecture in England." Mr. Walter G. Penty, the president, occupied the chair. Mr. Perry, after referring to the position of architecture as a liberal art, and assigning to an architect the title of artist and craftsman, defined art as the visible or perceivable expression of the creative faculty of the human mind and imagination; and in referring to the architecture of York, said, "We need only take a ten minutes' walk from where we are to one of the oldest buildings in our land built by natives, and look upon a piece of undoubtedly genuine Saxon architecture." He alluded to the tower of the Church of St. Mary, Bishophill Junior. In another ten minutes, by crossing the new bridge, we can, at St. Denis and St. Margaret's Churches, see Norman work of a pure and richly decorative character; and wandering leisurely on we can in the various churches of the city see specimens of the Early English, Decorated, and Perpendicular, the Tudor, and Elizabethan styles, while in the glorious Minster we can, by careful and painstaking survey, study specimens of its numerous styles in their purity and richest beauty. On the motion of the President, seconded by Mr. Wm. Brown, a hearty vote of thanks was unanimously accorded to Mr. Perry for his paper.

Leeds Architectural Society.—This society held its annual *conversazione* on the 19th inst. It was largely attended, and there was a good display of pictures, drawings, &c. The President, Mr. J. B. Fraser, in the course of a short address, said:—"The society is now in the seventh year of its existence, and though comparatively young, I am happy to say it is vigorous and flourishing, in spite of many difficulties, one of which has been the want of a permanent home, which we have now acquired. And we now hope that our future will be one of extended usefulness, mutual help, and prosperity. Although for many years past the medical and legal professions have had their societies and associations for instruction and social intercourse, the architectural fraternity have only recently (at any rate, in the provinces) made an effort at combining for their mutual benefit as members of the same profession. Short as our existence as a society has been, we are already beginning to feel the benefit of it, and to find that, principally through its means and that of kindred associations, the public are taking more interest in the doings and sayings of the architectural world. The recent revival, or rather I should say the birth, of what is popularly known as art-feeling in this country, and which no doubt owed its origin in a great measure to the International Exhibitions of 1851, 1862, and 1867, has not only led to improved taste in the matter of dress, furniture, and other surroundings, but it has awakened a keen interest in the queen of all arts,—that of architecture. So long as an intelligent and discriminating interest is taken in our art by an educated public, so long shall we be obliged, for our own good fame and honour, to do our utmost to act up to the highest traditions of our art. Before distributing the prizes, the drawings for which are placed in the adjoining room, I feel it is necessary to point out that the want of a settled habitation has also told very seriously against the classes, and, consequently, the work produced by the students, which I feel confident will be remedied in the future, as we shall now be enabled to enter into a more systematic course of instruction under the guidance, help, and encouragement of the senior members of the profession.——The prizes were six in number, and were as follow:—A prize of two guineas, offered by the President for a design for an hotel and drawing of an old house at Shipley, was awarded to Mr. A. Gaunt; Ruskin's "Seven Lamps of Architecture," offered by Mr. John Tweedale, was awarded to Mr. Alfred Williamson for designing work done at the class meetings of the Society; an album, offered by Mr. J. R. Watson, was awarded to Frank B. Howden for designs for a settle and two chairs; Sir G. G. Scott's "Lectures on Mediæval Architecture," offered by Mr. Cribb (of the firm of Marsh, Jones, & Cribb), was awarded to Mr. J. H. Roodhouse for design in colour for the decoration of the side of a room. Two volumes on "Building Construction," offered by Major R. W. Moore, were awarded to Mr. G. Stevenson for an interior perspective view, in colour. The Science and Art Department's volume on "Building Materials," offered by Mr. W. H. Thorp, was awarded to Mr. Alfred Williamson for measured drawings of the old oak screen, St. John's Church, Leeds.

VALUE OF PROPERTY IN MAYFAIR.

LAST week, at the Auction Mart, the mansion, No. 8, Bolton's-row, Mayfair, together with other premises at the rear, known as Bolton's-yard, were offered for sale by Messrs. Debenham, Tewson, & Co. The entire area of the property is 4,080 square feet, the premises in Bolton's-row being leasehold, for the residue of a term of 973 years from Michaelmas, 1749, with an apportioned ground-rent of 5s. per annum. Of the remaining portion of the property a portion is leasehold under the same lease, the residue being freehold. On the property in Bolton's-yard there are two dwelling-houses, four coach-houses, and stabling for thirteen horses, in addition to harness-rooms. The auctioneer, in submitting the property, observed that the existing buildings were ill-adapted to the requirements of so fashionable a locality, and said that the value of the property would be very considerably increased if the present structures were taken down, and a more modern residence, with good stabling, erected upon the site. After a brisk competition, the property was sold for 8,000*l.*

ART IMPOSTORS.

SIR,—The *cause célèbre* which is at present attracting so much public attention, and more particularly the attention of artists of every kind, is, I think, one that cannot fail to be productive of some good, and, whether or not the gentleman whose artistic merit is called in question deserves the unsavoury epithet which has been applied to him, the result of the trial is likely to be wholesome and purifying. That some so-called artists and authors contrive, by a judicious application of the persuasive guinea, to secure the honours and rewards due to works which they have not executed, and could never hope to, is a fact pretty well known to most of us who make our living by our art, and that this state of things is an institution as old as it is ugly, we are told in Isaac Disraeli's "Curiosities of Literature," where some very startling instances of literary imposture are revealed. Indeed, it is pretty certain that matters have been in a much worse state than they now are, though their present condition is far enough from being a satisfactory one.

Such a trial as that now pending is probably a great surprise to many of the general public, who would scarcely expect to find the huckstering spirit rife among artists, and would never have looked for such evil-smelling reports among men of eminence and fame. To them this case will come like a revelation; and if, as will most likely happen, it determines them in future to bestow their commissions more warily,—to patronise, not the pander, but the artist,—the consummation will be a happy one.

The reason of the existence of such a state of things originates, I think, with artists themselves. It is, unfortunately, the case that business acumen is but seldom the companion of excellence in art. The artist is too often thriftless, generous, and careless in matters mundane. With the gifts of a Turner for painting, or a Foley for sculpture, he is in business affairs likely enough the inferior of any solicitor's office-boy. This fact is only too readily and joyfully grasped by those who atone for a lack of artistic merit by a decided mercantile talent, and a not too nice sense of honour,—the middlemen, in fact, whom the public so bountifully fees, and would so willingly dispense with. It is to be hoped these gentry will receive a blow where they feel it most, namely, in their pockets.

In our own profession, by which I mean architecture, middle-men are not unfrequent. By these I do not mean men who allow important work to be done by an assistant; for it is obvious that an architect may, and must receive, a far greater share of skilled assistance than would be becoming in a sculptor or painter. But I have known, and know now, of men who are utterly destitute alike of practical knowledge and artistic talent,—men who are incapable of doing anything on their own responsibility, and who yet enjoy not only a lucrative practice, but the fame which of right belongs to some retiring artist in their office, whom they in turn remunerate sparingly enough. The practice of men like these cannot but be ill-conducted in the main, and they reflect little credit on our profession as a body. Dirt, we are told, is matter in the wrong place, and these gentlemen are certainly in their wrong place. I cannot help thinking that it would have been not only better for us, but better by far for them, had they made choice of some other calling; for surely their talents are thrown away in a poor profession like ours, when, had they elected to be butchers or hucksters, they might soon have had both hands deep in the pockets of the public.

There are again within the pale of our profession men who, on the strength of knowing one or two clever draughtsmen and designers who are glad of any employment, will advertise themselves as ready to undertake any kind of work on moderate terms. Having thus obtained an order, they sub-let it to the artist upon considerably *more* moderate terms, and so realise

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fat commission at the expense of the profession to which they cannot properly be said to belong. It would surely promote a healthier state of things if employers would endeavour to make sure that they are dealing with the artist at first hand, and so dispense with these agents, barnacles who stick to the bottom of the architectural craft, and who might be cleaned off with much advantage.

"The middle-man," said that aggrieved individual to Mr. *Fun*, in one of the clever series of sketches signed "J. S.," "*must* live." "*Je n'en vois la nécessité*" is Mr. *Fun's* rejoinder; and so say I, and, I think, so say all of us.

W. M.

LONDON ITEMS.

SIR, — Although for many years I have scanned my *Builder*, almost before my *Times*, I sometimes miss numbers when absent from home, &c.; therefore, if these *items* have been noticed or discussed before in or by your issues, I ask pardon:—

Item.—There is an original building of brick, stone faced, in Victoria-street, called the "Army and Navy Club,"—an ornament to the district, worth looking at. The giants,—shall I say "caryatides"?—which support the doorway arch are unique.

Item.—There is a very effective structure in Cannon-street, City, used by Spiers & Pond, *vis à vis* Bush-lane, with a "minaret tower" (?), and they have "vandalled" it by about half a dozen railway electric wires on its finial! Phuh!

Item.—There is a coping stone to the railings of a comparatively new hospital in the Barnsbury-road, perfectly soft like sand,—all friable,—so that the socketed ends of the rail irons are left high and dry! It is a curiosity. What stone can it be? It is not artificial, I know. Why, this beats new quarry Bath stone!

Item.—When will they do away with that "eyesore" opposite the Mansion House, Lord Mayor's, *i e.*, the projecting tavern "European?" Been so forty years!

Item.—Why will not the Metropolitan Board of Works pull down that cruelly dangerous corner and block of old houses between Islington Church and Islington Green?

Item.—What wonderfully deep foundations they are digging at the site of the hotel opposite the "Grand," Northumberland-avenue!—about 30 ft. deep,—and by a steam crane or derrick (*sic ?*), like you described on the Canal, in Holland. We have magnificent hotels in London now; second to American; equal to Paris. It should seem strange, but the "wealthy world" is migratory "all the year round" in 1882.

Item.—I note that the wonderful "copper man," of the Berlin Rathhaus roof is fixed exactly on your description of the system of Japanese houses on "volcanic" soils, *i.e.*, as "a movable fixature," similar to the old mail-coach centre of gravity, below the centre; stability and movement combined "midships."

Item.—What a splendid piece of ironwork that is, the railing (wrought) in front of the New Law Courts! Quite "Spanish-Moorish." *Apropos!* What a disgrace it is that the big clock of the tower is still unfinished!—the clock of the Courts, I mean,—and this after the Queen has opened them! It has been over four years in the same condition!

Item.—Pray, sir, what are fireproof building materials? Wrought-iron twists any way, cast-iron melts right away; brick and stone are cracked, powdered, and literally "licked up," like Elijah's sacrifice, when the intense heat of white heat of great fires happens, and subjects them to only thirty minutes' calcining. I believe nothing is fireproof at highest temperature of incandescence; not even talc, asbestos, or even crucible clays, &c.

Item.—I saw the last of the old "Roman wall" (four yards thick) picked away in Broadway, Ludgate-hill. The stone actually broke in bits before the Roman cement or concrete, and I noticed there were curious wooden wedges of very "tarry" pinewood driven into the joints, in perfect preservation, after, say, 2,000 years,—kind of antiseptic action?

Item.—Nearly all the large fires of late have been at handsome, large, new buildings, *i.e.*, in London, and out of the metropolis the eight "stately homes of England" have had a "cycle" of, as it were, epidemic-burning of old, dried, scorched beams of wood let into the solid masonry, and all close to enormous fire-grates. What folly! Let us hope a lesson has been learned for thorough universal scrutiny and also alteration in the mansions. Excuse long letter, my last to you in 1882. Adieu!

LONDON ARGUS.

MANAGEMENT OF COMPETITIONS.

SIR,—Seeing that the Cheltenham Gas Company are again advertising for tenders for new offices, I enclose lists of Tenders which I obtained for the directors for the carrying out of my design for the same building (which was accepted in the first competition), trusting that you will publish them for the benefit of the contractors who again meditate tendering.

I have given my reason for resigning the position of architect at the foot of the list of tenders.*

A. SMITH.

First List.—Dated the 26th day of May, 1882.

For the erection of offices, with residence, at Cheltenham, for the Cheltenham Gas Light and Coke Company. Quantities by the architect, Mr. Alfred Smith, Mitcheldean, Gloucestershire:—

Bennett, Birmingham	£13,840	0	0
Wingate, Gloucester	13,825	0	0
Jones, Gloucester	13,750	0	0
Bowers & Co., Hereford	11,500	0	0
Bradney & Co., Wolverhampton	11,380	0	0
Veals, Bristol	11,349	0	0
Smith, Leamington	11,300	0	0
Scamell, Cheltenham	11,035	0	0
Coleman Bros., Chaxhill	10,835	0	0
Forse, Brictol	10,700	0	0
Howell & Son, Bristol	10,700	0	0
Collins, Tewkesbury	10,680	0	0
Billings, Cheltenham	10,525	0	0
Foster, Abergavenny	9,500	0	0
Miller, Carr, & Co., Birmingham	9,495	0	0
Pickthall, Bromsgrove	8,840	0	0
Inwood, Malvern	8,441	0	0
Architect's Estimate	9,162	0	0

Second List.—Dated the 2nd day of June, 1882:—

Bennett, Birmingham	£9,278	0	0
Smith, Leamington	8,867	0	0
Scamell, Cheltenham	8,554	0	0
Veals, Bristol	8,552	0	0
Forse, Bristol	8,475	0	0
Coleman Bros., Chaxhill	8,354	0	0
Foster, Abergavenny	8,280	0	0
Jones, Gloucester	8,147	0	0
Billings, Cheltenham	7,718	0	0
Collins, Tewkesbury	7,670	0	0
Inwood, Malvern	7,091	0	0
Miller, Carr, & Co., Birmingham	6,838	0	0
Pickthall, Bromsgrove	5,940	0	0
Architect's Estimate	7,021	0	0

Third List.—Dated the 1st day of July, 1882:—

Bennett, Birmingham	£7,993	0	0
Bowers, Hereford	7,800	0	0
Jones, Gloucester	7,550	0	0
Bradney & Co., Wolverhampton	7,439	0	0
Smith, Leamington	7,167	0	0
Forse, Bristol	6,625	0	0
Foster, Abergavenny	6,350	0	0
Coleman Bros., Chaxhill	6,249	0	0
Veals, Bristol	5,994	0	0
Scamell, Cheltenham	5,994	0	0
Billings, Cheltenham	5,965	0	0
Miller, Carr, & Co., Birmingham	5,961	0	0
Architect's Estimate	6,141	0	0

FIREPROOF WAREHOUSES.

SIR,—Soon after the great fire in Tooley-street I showed to Alderman Humphery, the Editor of the *Builder*, and others, the model of a warehouse that could not possibly burn down. The name adopted was that of "the tank warehouse." A brief description of the idea will, I imagine, suffice to prove its indestructibility by fire, however numerous the stories or floors of such building. All openings to the floors should be elevated a foot or a foot and a half above such floors, where goods are taken in or where staircases open. The floor would then form a shallow tank, so that each such floor could be filled with water to the depth of a foot or more that could not run away. In the walls of the building, round holes might be cut covered with thin glass, where there are no windows. Now, in case of fire, the engines would pour water into every floor, and there would be so many tanks of water to prevent the spread of fire, provided the floors were properly constructed. The water from the fire-engines would, of course, be poured into the building through the windows or holes. In such buildings where there are hollow columns of iron, these should be always kept filled with water, having a small hole near the top fitted with a wooden plug. If in a fire this column became heated to excess it would act as a common boiler, generate steam, and thrust out the plug mentioned. It is evident that so filled with water such column could not become red hot and so add to the fire. I am neither builder nor architect, but simply an amateur in these matters, and, therefore, for the sake of preventing the recurrence of such terrible fires as we have recently witnessed, and without any *arrière pensée*, I beg a small space in your highly scientific columns.

J. J. LOCKHART.

* Mr. Smith resigned the office of architect in consequence of the directors refusing to accept any tender after putting the contractors and himself to the trouble of supplying and obtaining three separate estimates.

PROTECTION OF IRON GIRDERS.

SIR,—I have taken out a provisional patent for the purpose of protecting iron girders from fires. The recent fires in Wood-street have shown that the expansion and distortion of the iron girders as there used have been the cause of upsetting walls and of rendering it perfectly unsafe for the firemen or the salvage corps to get about after the fire had got any hold of the buildings. If you have seen the ruins after the fire you must have noticed that many of the iron girders are positively burned in two and part consumed. Now, as the greater part of these Manchester warehouses are built in the same way, I am desirous of bringing my patent before your readers that the professional men employed to rebuild may know that in a simple and inexpensive way the girders can be constructed so that in case of fire, no matter how fierce, the girders can be kept cool and in their places, steadying the party walls (even should the roof and all the woodwork of the floors have been consumed), and not acting as levers to throw them down, as appears to have been the case in the fire referred to. The specification herewith will, I think, show tolerably clearly what is intended.

I propose all the girders are to be box-girders communicating with each other, that a main should communicate with the girders and fill them with water, that perforations are made in the side of the girders to allow the water to pass through, and so a continual running stream of cold water from the main in the street is passing through at a rapid rate and keeping the girders cool. Should the usual matchboarded partition be under the girder the water would prevent its burning as freely. The iron doors in the division walls I propose to protect by having smaller girders for lintels, and allowing a stream of water to constantly pour down on each side of them.

JOHN M. HOOKER.

FIRES IN THEATRES.

SIR,—I should like to suggest a remedy for one of the chief difficulties to be contended with in extinguishing fires, viz., the immense quantity of gas which is escaping through the broken pipes, &c. If in the pathway outside every theatre and large public building a stop-cock were fixed on the service gas-pipe, encased in a locked box, but easy to get at, the fire brigade men would be able to turn the gas off effectually.

ERNEST VAN PUTTEN.

The Proposed Roman Catholic Cathedral of Westminster.—At length it would seem (says the *Times*) that there is some prospect of the erection of this long-contemplated edifice,—one on which Cardinal Wiseman set his heart,—being realised under his successor, Cardinal Manning. It is only just and right, however, to say that when urged, on his accession, to take steps for inaugurating such a work, Cardinal Manning steadily refused to do so, saying that he would be content without a sumptuous edifice of the kind as long as there was a want of schools to receive the little ones of his flock. Even this result he has not yet beheld, though year by year he is able to boast that he has done something towards overtaking the deficiency. Some six or eight years ago, however, the site for the intended cathedral,—about two acres and a half,—between Vauxhall Bridge-road and Victoria-street, was purchased, with a view to future building operations, and Mr. Henry Clutton was commissioned to make a design for the cathedral. But within the last few months it appears that a further step has been taken in the matter. Sir Tatton Sykes, of Sledmere, a wealthy Yorkshire squire, has been seeking to be received into the Roman communion, and has notified to Cardinal Manning his desire to mark his reception into the Church by the spontaneous offer to build the new Westminster Cathedral at his own cost; and it is understood that he has chosen as his model the votive church of St. Saviour at Vienna, erected to commemorate the escape of the Emperor of Austria from an assassin's hands.

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LIBELLING A BUILDER.

AT the Central Criminal Court, on the 15th inst., Henry Ashford, 44, a builder's clerk, was indicted for publishing a malicious libel of and concerning Mr. Edward William Bradwell. The case was reported in the *Builder* on the occasion of the initial proceedings at the Police Court (see p. 635, *ante*).

Mr. Grain and Mr. J. Watson prosecuted; Mr. Montagu Williams, Mr. Lynch, and Mr. Goodrich defended.

In opening the case for the prosecution, Mr. Grain said that, justification having been pleaded, the trial would turn out one of considerable importance and gravity. The prosecutor carried on business in Great Portland-street, and was well known in the theatrical world as a builder and decorator of theatres. In 1878 the St. James's Theatre became the property of the Earl of Kilmorey, who was then Lord Newry, and he employed the prosecutor to alter the theatre, and practically to rebuild it. At that time the prisoner was a clerk in the prosecutor's employ. When the work was completed, it came to nearly 8,000*l.*, and, deducting the sums paid upon the certificates of the architect (Mr. Verity), there remained a balance of 3,000*l.* due from the Earl of Kilmorey. An action was brought to recover the money. It was referred by the Lord Chief Justice to Mr. Dowdeswell to investigate the facts and accounts. Prosecutor's books were time after time examined, and it was ultimately arranged by the experts appointed by Mr. Dowdeswell to take the prime cost of the materials and labour, adding 15 per cent. as a proper percentage for the builder, and it was upon this basis that Mr. Dowdeswell eventually made his award, which was for a considerable sum. The Earl of Kilmorey had brought a counter-claim against the prosecutor for 1,000*l.* or 2,000*l.* for the delay in completing the building, but this was dismissed with the nominal damages of 40s. and no costs. Judgment was given for the prosecutor in August or September last year, the amount and costs were all duly paid, and nothing further was thought of the matter until September last, when the prisoner left the prosecutor, and, applying for a situation with another builder, the latter wrote to the prosecutor for the prisoner's character. What the prosecutor considered to be a fair and honourable character was given, but, further explanations being required, the prisoner threatened that unless he gave him the character he would say that he (prosecutor) had falsified his books in the matter of the Earl of Kilmorey. The prosecutor took no notice of this, but, to his surprise, he received from Mr. Dowdeswell a copy of the letter he had received from the prisoner, in which he charged him with falsifying his accounts of the prime cost of the building for the purposes of the arbitration. A similar letter was sent to the Earl of Kilmorey and to others.

A number of witnesses were called, and after an intimation from the Recorder, the prisoner pleaded "Guilty," and was bound over in his own recognizances in 100*l.* to come up for judgment if called upon.

CAUTION TO BUILDERS.

BAD MORTAR.

AT the Worship-street Police-court, on the 21st inst., Mr. Bushby gave judgment in a case between the Metropolitan Board of Works and S. Muncey, builder, Hackney Wick.

In August last, at the same police-court, proceedings were taken by Mr. Alexander Payne, the District Surveyor of East Hackney (South) and North Bow, against the defendant, for using mortar not composed of good sharp sand without earthy matter, as required by the By-laws of the Board, in which case the defendant was fined 60s., as reported in our columns; but the defendant continued to use inferior mortar, and proceeded to complete the buildings without pulling down any of the condemned parts. The Metropolitan Board of Works was therefore driven to take proceedings under the Metropolis Management and Building Acts Amendment Act, 1878, for an order to pull down the houses. The case first came on on the 2nd of November, and was adjourned several times on technical points raised by the defendant's counsel. On the 30th of November the case for the prosecution was heard. Mr. Besley appeared on behalf of the Metropolitan Board of Works, and stated that the Board, having regard to their duties to the public, felt that the fine of 60s. already imposed would not cure the evil, and ensure the use of good mortar in the future: it was, therefore, necessary for them to ask for an order to pull down, under sec. 17, Act 1878. He then called

Mr. A. Payne, the District Surveyor of the district, who produced specimens of the mortar and material used for sand, and gave the dates of his various inspections of the buildings. The mortar was not such as is required by the By-laws, as it was not composed of clean sharp sand, and was full of earthy matter: it easily crumbled, and did not adhere to the bricks, and when put into water dissolved into something like mud. There had been no improvement in the building, nor had any part been pulled down.

Mr. Blashill, District Surveyor of the adjoining district, was then called, and stated that he had inspected the buildings with the last witness on the 27th of November, and taken specimens of mortar from the back addition. The mortar was not in accordance with the Board's By-laws. There was some gritty substance in it, but there was also earthy matter, and it did not hold together nor adhere to the bricks: houses built with such a material would be more damp and unhealthy than if built with proper mortar.

This concluded the case for the prosecution.

The defendant's counsel, Mr. R. B. Muir, then asked the magistrate to take down the following objections:—(1.) He maintained that proceedings could not be taken against the builder after he had completed the work: they should be taken against the occupier; (2.) That the By-laws were *ultra vires*, as under sec. 12 (1855) the Board had no power to make By-laws about mortar; (3.) That the notice of the District Surveyor was not explicit enough in specifying what part of the buildings was to be pulled down. He then said he would show that the mortar was in accordance with the Board's By-laws.

Mr. Uriah B. Broadribb was called, and said he was a surveyor, and manager to Messrs. Reddall & Sons. He had superintended the building of the houses on this estate; he had no fault to find with the mortar from these houses. He produced a sample taken from the back additions: the quality was rather variable. He should say that, according to the cottage sort of property, they were of first-class construction.

Cross-examined by Mr. Besley.—He said he had no specimens on that day from the main building; he had given evidence on the former occasion when the defendant was fined 60s. In his opinion that was a wrong judgment, and no part of the buildings had been taken down. Mr. Muncey only found the labour on this job, the freeholder found the materials. Witness saw a barge-load of sand brought to the job; this was at the beginning of August; the main walls were then up. Being asked as to where the sand came from before that time, he mentioned a lot of concrete that had been taken from various roads; it was not his province to superintend the mixing of the mortar.

Being asked by the Magistrate, he said the name of the freeholder was Mr. J. F. Raw.

Mr. S. Muncey, the builder, was called, and stated that the mortar was composed of Thames sand, mixed in the proportion of two or three of sand to one of lime; there was also a small portion of sifted ballast mixed with it. He was finishing these houses by day-work; the money was advanced by a solicitor, Mr. Raw, at so much a week; he had given notice to Mr. Payne, as builder; he was fined 60s. for this mortar, but had not pulled down any part of the buildings; he had had four barges of sand to these houses; there was no perceptible loam in the mortar.

Several workmen were then called, and deposed to having mixed the mortar and carted sand on to the job, but they could give no dates.

A local builder was called, who produced a specimen of the mortar, which he said was good. In cross-examination, he stated he had served his apprenticeship as a carpenter, but had had a great deal of general experience, and had been the foreman of large works.

The District Surveyor was then recalled, and said he had examined the specimens submitted for the defence, and that they contained earthy matter, nor was there any evidence of good Thames sand about them.

Mr. Blashill was re-examined, and said that these specimens did not contain Thames sand, and that there was dirt and earthy matter in them.

The Magistrate said he would examine the specimens and give judgment on that day week (December 21st).

Mr. Besley, for the Metropolitan Board of Works, said that if his worship liked to call in the assistance of a professional adviser, he would agree, on behalf of the Board, to pay half the expense whichever way it went.

On December 21st, the magistrate said that an analysis of this mortar would cost 21*l.*, and that if either side were willing to pay for this he would have it adjourned to see the result; otherwise, he was willing himself to give judgment from the evidence and from the specimens he had seen.

Mr. Burton, who attended on behalf of the Metropolitan Board of Works, said he was quite willing to accept his worship's judgment.

Mr. Raw, on behalf of the defendant, said he was perfectly willing to accept the magistrate's judgment, presuming that if he decided in favour of the Board he would allow the points he had raised to be brought before the Superior Court.

The magistrate then referred to the points, namely, as to whether the builder was the right party to proceed against, and whether the By-laws were *ultra vires*, and thirdly, whether the notice was vague. He said he could not grant a case upon them. He did not like to send up to the Court of Queen's Bench points which they would pooh-pooh at once. The defendant would have to apply for a *mandamus*. The magistrate (Mr. H. J. Bushby) then delivered judgment. He said he had heard the evidence and had examined the specimens of mortar produced; some of these crumbled in the hand. It was no answer for the defendants to bring other specimens which did not crumble, unless they could show that the specimens brought by the prosecution were not taken from their houses which they never ventured to do. Therefore, he ruled that these buildings had not been constructed of solid strong mortar according to the meaning of the Act, and he gave the order as prayed for.

Mr. Burton then, on behalf of the Board, asked for costs.

The magistrate said he was not in the habit of granting costs, except where there was something like wilful misfeasance; but in this case there really was something like that, because there had been a previous order and fine inflicted in consequence of this mortar having been adjudged to be bad; but not the slightest action had been taken by the defendant, thus compelling the Board to take fresh proceedings. He should therefore grant the costs, but they would be limited to the costs of one day.

RIGHT OF BUILDINGS TO SUPPORT BY SUBTERRANEAN WATER.

WARING *v.* THE PANDORA THEATRE COMPANY.

IN this case, which came before Mr. Justice Fry (Chancery Division, December 21st), the plaintiffs were the owners and tenants of a house, No. 3, Leicester-street, which is situate next to property on which the Pandora Theatre Company have commenced building their proposed theatre. The plaintiffs sued in respect of danger and injury to their house by the abstraction of water from under their foundation.

This was a motion for an interlocutory injunction to restrain the pumping of water from excavations which the defendants' builders have made. No complaint was made in respect merely of the excavation, but the evidence showed that, owing to the abstraction of water, the house had already greatly cracked and was dangerous, and it was sworn that, in the opinion of the plaintiffs' witnesses, if the pumping were continued it must come down.

Mr. Norton, for the defendant company, insisted that they were, on the authorities, acting within their strict rights, drawing a distinction between a right to support from adjoining land and from water.

Mr. Justice Fry said a curious and interesting question was raised as to whether the right which the owner of an old house had to support from the adjacent land extended also to water. He was not going to decide that question on the present occasion, but, on the balance of convenience, he was of opinion that he must grant an injunction on an undertaking by the plaintiffs as to damages. He thought if it were not granted the house would undoubtedly suffer great injury; on the other hand, he thought he had sufficient acquaintance with building to know that if this mode of proceeding was stopped, some other mode of constructing these works would be found and adopted by the defendants' architects and builders.

PROVINCIAL NEWS.

Leeds.—Since the Town Council sanctioned the project for providing Leeds with a new cattle-market at Copley Hill or Whitehall-road, the necessary preliminaries have been going forward. The land has been bought and paid for by the Corporation, and the authorities are making the best terms they can with the owners and occupiers of the property which will be required. When the contracts are to be let is said to be a matter which will be settled before long. In the meantime, the butchers, slaughter-house proprietors, and others who have from the outset resisted every proposal to take the market away from North-street, do not seem to be relaxing in their endeavours to thwart the proposals of the Town Council. The more prominent opponents of the scheme are said to have come to the conclusion that the attention which the Markets Committee and its sub-committees have latterly been paying to the slaughter-house branch of the question means that the new market will prove to be the thin end of the wedge, and that the addition of an abattoir may very soon be regarded as inevitable.

Manchester.—The Corporation of Manchester having obtained power, by an Act passed last session, to acquire and maintain an art gallery, the Royal Institution has passed into the hands of the Council. The managing committee will consist of twenty-one gentlemen, of whom fourteen are to be elected annually by the Corporation and seven by the governors of the Royal Institution. Various alterations will be made in the interior of the building for the purpose of increasing the space, and when these are effected a second art gallery or museum will, ere long, be provided in Queen's Park, an offer having been accepted by the City Council from the Manchester Art Museum Committee of

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pictures and works of art valued at about 5,000*l.*

Whitchurch (*Salop*). — The new workhouse chapel was opened on the 1st inst. The building, which is situated on the north side of the workhouse, is described as having been built in the old English brick and half-timber style. It is made to accommodate 130 persons, and is 60 ft. long and 20 ft. wide. The building comprises porch, nave, vestry, chancel, and baptistery. It has an open roof, which is constructed of pitch-pine. The principals are framed into upright pillars brought down to the ground; against these pillars corbels are placed to receive the moulded circular ribs which span the nave. The seats are framed with simple ornamental ends in pitch-pine. The pulpit is framed oak upon a plain base of Caen stone; the centre panel is carved, and the corners contain portraits of the four Evangelists, painted on china. The bowl of the font, it is said, was originally used at the old church, Middlewich, and was presented to the workhouse some time since by Mr. B. L. Vawdrey, of Tushingham Hall, and has been mounted on a suitable base and pedestal of statuary marble. In the chancel is a stained glass window, the subject treated being our Saviour restoring the sight of the blind beggar on his way to Jericho. This is the gift of the Rev. J. H. Brooks, of Steeple Aston Rectory, who entrusted its execution to Mr. John Davies, glass stainer, Shrewsbury. The building itself, erected at a cost of about 700*l.*, is the gift of Mr. Wm. L. Brookes. The chapel was designed by and carried out under the superintendence of Mr. Walter Webb, architect, of Shrewsbury. The builders were Messrs. Corfield & Dodd.

CHURCH-BUILDING NEWS.

Christchurch, Hants.—A new roof has just been placed over the north transept of the Priory Church, Christchurch. It is open-timbered, and in character with the other later Mediæval roofs in the building, *i.e.*, of tie-beam construction with moulded purlins, plain in design, but with very substantial timbers of English oak, and covered with 8 lb. lead. The parapet on the west side has been taken down where necessary, and the old stones carefully reset, as well as the internal stone cornice, which has now been properly bonded. The work has been under the superintendence of Mr. B. Edmund Ferrey, and carried out by Mr. William Howe, of Christchurch.

Whalley Range (*Manchester*). — The new Church of St. Edmund, which has been erected in the Alexandra-road, Whalley Range, was consecrated by the Bishop of Manchester on the 20th inst. The foundation-stone of the building was laid by Mrs. Fraser on the 29th of July, 1881. The church is built of brick, with Yorkshire stone facings and white stone dressings, and is in the Early English style of architecture. It consists of a nave, 100 ft. by 36 ft., and two aisles, each 95 ft. by 13 ft. 6 in. Vestries for the clergy and the choir are situated on the south side. The chancel, which is lighted by seven tracery-headed windows, is 38 ft. long by 25 ft. wide, and has a tiled floor. There is an organ-chamber on the south side of the chancel, with which it is connected by a large moulded archway. The chamber is a spacious one, and is lined throughout with boarding. The tower, which is situated at the north-east corner of the church, and the lower part of which forms one of the principal entrances, is at present incomplete, owing to lack of funds. When finished it will rise to a height of about 170 ft., and terminate with a wrought iron finial. There is another entrance to the building at the north-west corner. Each entrance has a spacious vestibule, and is furnished with two pairs of swing doors, which prevent the possibility of inconvenience arising from draughts. Two extra doors have been provided, but these will only be used for exit purposes. The nave arcade, which is lofty, is supported on polished granite columns, with Yorkshire stone caps and bases. The side aisles are lighted by means of two tracery-headed windows, and the nave by twenty-eight similar windows. At the west end there is a large and very handsome six-light window, with a rich tracery head. Special attention has been given to the important matter of ventilation. The font, which cost 40*l.*, and was specially designed by the architect, has been presented to the committee by Miss Lees, of Whalley Range. The lectern, consisting of brass and iron scroll work, was given by the members of the Iron Church congregation. The pulpit and the reading-desk consist of pitch pine, the panels being filled in with open tracery resting on stone bases. The seats, which have been designed to accommodate 1,000 worshippers, are also constructed of pitch pine. The builder was Mr. James Herd, and the whole of the work has been carried out from the designs and under the superintendence of Mr. Henry R. Price, architect, Cross-street, Manchester.

Whitworth. — A new Mission Church is in course of erection in St. Bartholomew's parish, Whitworth, near Rochdale, and is expected to be ready for opening early in the ensuing spring. Messrs. Cheetham & Duncan, of Rochdale, are the architects.

Books.

A Series of Twelve Sheets of Pen and Ink Sketches of the Old Domestic Architecture of Oxford. By H. W. Moore, 6, Beaumont-street, Oxford.

These sketches are published with the view of preserving a memento of the picturesque examples of old work to be found about the streets of Oxford. They are of the style which has recently become fashionable after entire neglect for years, and some of the subjects, though originally public-houses in back yards, will probably be adopted as types for residences in fashionable localities.

VARIORUM.

The *Estimator's Journal*, published by Batsford, High Holborn, is a Monthly List of net cash prices for building materials required in estimating, net trade lists, &c. Whether changes often take place in a month we are not prepared to say, but they may, nevertheless, occur often enough to justify the trifling outlay involved. It is edited by Mr. George Stephenson, of Hampstead.——A bundle of Diaries and Calendars come to us from Charles Letts, and very good and various in character they are. They must be distinguished in ordering from those of Letts & Co.——"Whitaker's Almanack," 1883, includes such a body of original information as is scarcely to be found elsewhere. It grows in size every year.——Amongst the Diaries comes one in connexion with the *Sanitary Record*, intended specially for the medical practitioner. The blank space left for each day must be ridiculously too small for a medical man in good practice. The introduction of advertisements on the blotting-paper (chiefly of wines and spirits) is an abomination that cannot be too soon pronounced against.

Miscellanea.

Fire at Gunton Hall.—On the 18th inst. Gunton Hall, the seat of Lord Suffield, was to a large extent destroyed by fire. The hall was a handsome white brick mansion standing on a slight eminence about midway between Aylsham and North Walsham. It had been enlarged by successive generations of the Harbord family. Before the engines of the local fire brigades began to play upon the burning pile, much time had been lost, and the flames had acquired such a hold upon the mansion that the utmost which could be done was to save a portion of the building. Most of the pictures were removed in safety, and a considerable portion of the furniture was also rescued from the flames, but some was destroyed. The new front of the hall was destroyed, and, in fact, the greater part of the mansion became a mere wreck. The damage done is roughly estimated at 30,000*l.*

Presentation Casket for Lord Wolseley. The General Purposes Committee of the Corporation selected the design submitted by Messrs. George Edward & Sons, of the Poultry, from among those sent in by the leading goldsmiths of the City and the West End. The casket is of gold, and both in its shape and ornamentation is Egyptian in style.

Chief Assistant in the Engineer's Office, London.—We are asked to mention that, although on the first show of hands, the numbers were: Mr. De Pape, 28; Mr. D. J. Ross, 33,—as stated in our paragraph,—at the ultimate voting the numbers were: for the first-named gentleman, 13, and for Mr. Ross, 35.

The Fatal Accident on the Site of the Wood-street Fire. — On the 20th inst. Mr. Payne resumed the inquest on the body of John Turner, aged 34, a locksmith in the employment of Messrs. Chubb & Co. On the 12th inst. he, with other men, went into the ruins of the great fire in Wood-street, with the object of opening the door of an iron safe which had fallen from one of the upper floors of Messrs. Rylands's warehouse. Just as they ceased hammering at the door of the safe, a huge wall fell a depth of 30 ft. on the deceased, crushing him to death. The witnesses, in reply to inquiries by the Coroner and the jury, stated that they received no caution of any sort from anybody as to the dangerous condition of the ruins. Mr. William Wollett, architect and surveyor, employed by the fire insurance company in such cases as these, said, if he saw any one going into a ruin of the kind in Wood-street, he should warn them, as it would be sure to be dangerous. In reply to Mr. Nicholls (who appeared for Messrs. Rylands), the witness said no one was absolutely in charge of the ruins of the fire until a surveyor had been appointed by the Fire Insurance Company. Up to a certain time the premises on fire were in charge of the Fire Brigade and the police. The Fire Brigade would give notice to the District Surveyor if the structure was dangerous. Replying to Mr. Farrar (who appeared for Messrs. Chubb), the witness said he had ordered that no one should be allowed to go into the ruins except the Salvage Corps, the police, and workpeople. The Coroner.—In your judgment, as a practical man, do you think the hammering at the safe on the Monday and Tuesday affected the wall in question in its then weak condition? Witness.—Of course it would. The least touch would tend to bring it down. Police-sergeant Phelps said he admitted Messrs. Chubb's men within the hoarding at the end of the street on one of the men's producing a card of the firm. The police had no power to keep the workpeople out of the ruins, although the walls were dangerous. The men, they assumed, knew the risk they were running. Mr. D. Cameron, representing Mr. Woodthorpe, the District Surveyor, said that when it was known that the walls of the premises were dangerous, a notice was sent to the Commissioners of Sewers for a builder to go and do what was necessary,—to first see to the outside walls. The jury returned a verdict "That the deceased was accidentally killed by the falling of a wall. They added, as a rider, "We wish to express our strong disapprobation of the absence of necessary precaution in regard to the dangerous character of the buildings."

The Birmingham and Aston Steam Tramway.—The new line of tramway which has been in course of construction during the last few months between the centre of Birmingham, and Aston, by way of Corporation-street, Aston-street, Aston-road, and Lichfield-road, has now been completed and opened for traffic. On the 22nd inst. the official inspection by Major-General Hutchinson, of the Local Government Board, took place. The company have determined to use steam-power for working the line instead of horses, and for this purpose have already purchased two engines, one by Messrs. Kitson & Company, of Leeds, and the other by Messrs. Wilkinson & Co., of Wigan. In many other towns where tramways have been more extensively brought into use than in Birmingham, steam has been adopted as the motive power with varying success.

Disastrous Fall of a Chimney in Bradford.—On Thursday morning the high chimney of a mill situate in Spring Mill-street, Bradford, fell upon the adjoining building, where a large number of persons were at work. It is reported that at least twenty-four persons were killed, and that forty were seriously injured. The chimney is stated to have been built in 1861, on the site of some coal workings, which were filled in with stone packing and concrete. It was 255 ft. high. Signs had exhibited themselves of weakness at the base, and men are said to have been engaged in trying to remedy the defects when the disaster took place. Was this work, affecting the safety of so many poor factory "hands,"—many of them women and children,—being done under competent advice and supervision?

"**Land Surveying and Levelling.**"—Mr. A. T. Walmisley will deliver the opening lecture of his course of eight lectures on this subject, in connexion with the Society of Engineers, in the Hall of the Society, 6, Westminster Chambers, on Monday, January 8.

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Work and Wages in the Brassfoundry Trade.—It is stated that for some time past the National Society of Amalgamated Brass-workers have been endeavouring to induce the employers to advance the wages of the operatives, and to restore the bonus which was formerly paid to the workmen. During the depression in the trade two or three years ago the 15 per cent. bonus usually paid on the list prices was reduced to 10 per cent. by the arbitrator, and the men on the revival of trade last summer asked that the bonus should be fully restored, and also that a general advance of 10 per cent. in wages should be conceded. An alteration in the minimum prices of the casters in the general cabinet department was also asked for. The operatives contend that from time almost immemorial it has been the custom in the trade to consider that casters should receive one price for their work, this price being regulated by weight. Gradually this custom has been encroached upon, they say, and for many years past different prices have been paid at various firms for the same class or work. In some instances casters employed on light work have been paid less than others who produce heavier goods. Their greatest claim for a levelling-up of prices paid to the casters, however, is that for the last twenty-five years patterns have been considerably reduced in weight by the coring of work which was previously cast solid, also by the patterns being reduced to meet manufacturers in competing with each other, or to conform to the fashion in the more artistic branches of the trade. This process of lightening patterns has, they urge, considerably reduced the earnings of casters. The increased number of cores has also had the same effect, inasmuch as journeymen casters fail to obtain help unless they are prepared to give at least 50 per cent. more to their under-hands than formerly. After a careful consideration of the claims of the operatives the representative employers in the brass cabinet department have agreed to the requirements of the men for raising the minimum price paid to the casters, and they also promise to favourably consider the question of the bonus. It is thought that the decision will give satisfaction to the men affected. The question of a general advance of 10 per cent. to the whole of the brassfounders has been deferred, the employers being desirous of waiting till the turn of the year in order to see whether the state of trade will justify any advance of wages.

A Large Ocean Dock. — The City of Adelaide, South Australia, has (according to an exchange) taken steps for the construction of an ocean dock of nearly 30 acres in extent, and 30 ft. deep at low water. The site is said to be excellently chosen, and the approach will be of the easiest character. The dock will afford harbourage for vessels of the largest class, and will be provided with the most modern appliances for docking, loading, and discharging vessels in all states of the weather. Railway communication between Adelaide and Melbourne is being established, and already a line of rail connects the capitals of Victoria and New South Wales, so that within a few years passengers and mails will be landed at Adelaide for all parts of Australia, and will reach their destination by rail, whilst the goods for other colonies will be discharged into intercolonial steamers of a class much superior to those now running. The capital for this enterprise, amounting to nearly a million, is to be provided by private persons.

Fall of a Mill Chimney at Batley.—On the 19th inst., about half-past eight o'clock a.m., a chimney in course of erection at New Brighton Mill, Carlinhow, Batley,—the scene of the disastrous boiler explosion which occurred on January 19th, 1881, whereby sixteen persons lost their lives,—fell to the ground with a loud crash. The chimney had attained a height of 114 ft., and is described as being substantially built of brick, the work being carried out by Mr. John Mortimer, contractor, Batley. It was intended to carry it to 150 ft. in height, but a few days ago it was noticed that the chimney was losing its perpendicular, and in consequence work was suspended. Fortunately, no one was injured, although several workpeople were near at the time.

The Belt Libel Case: Verdict.—This prolonged case, which has occupied forty-four days, was brought to a conclusion on Thursday, when the jury returned a verdict for the plaintiff, Mr. Belt, awarding him 5,000*l.* damages. The judge refused to stay execution.

A Leviathan Lathe. — Messrs. Smith, Beacock, & Tannett, of the Victoria Foundry, Water-lane, Leeds, have just completed a large treble-geared crank axle lathe, which has been made for a marine engineering firm in Marseilles, where it will be used for turning marine cranks, shafts, &c. It is (says the *Yorkshire Post*) probably the largest piece of work of its kind which has ever been constructed in Leeds. The height of the centres above the bed is 5 ft., so that an article 10 ft. diameter can be turned with the lathe. The face plate, which is 10 ft. 4 in. in diameter, is provided with jaws for gripping the work. The lathe-bed is 9 ft. wide, and is sufficiently long to allow a space of 34 ft. between the centres. There are two saddles, each with compound slide-rests, back and front, and having self-acting motions in all directions. The latest improvements have been adopted in the construction of the lathe. Amongst these may be mentioned the introduction of two screws within the bed, the advantage of this over the ordinary system of traversing the saddles by one screw or by a toothed rack and pinion, being that, with so wide a bed, the saddles slide more smoothly than they would otherwise do. Both the saddles and the loose headstock are moved quickly on the bed by a separate strap from that which drives the lathe headstock, and by this arrangement the necessity of running the driving-gear of the headstock to move the saddles and the loose headstock to their places for commencing work is obviated. Some idea may be gathered as to the immense proportions of the lathe when it is stated that its total weight is about ninety tons.

Italian Art Loan Collection at Glasgow.—On the 22nd inst. the Italian Art Loan Exhibition, in the Corporation Galleries, Glasgow, was opened by Lord Balfour of Burleigh. It is one of a series of exhibitions held under the auspices of the Corporation. The Queen has lent a number of valuable objects, including a shield by Benvenuto Cellini, which is valued at about 5,000*l.* Mr. Gladstone has sent three large glass cases containing fine carved ivories and beautiful examples of Italian jewellery. The Duke of Buccleuch has furnished a rare lot of prints by old Italian masters, Marc Antonio Raimondi, Agostino Veniziano, Agostino Caracci, and others. From the Marquis of Lothian has been received a collection, which comprises some specimens of Italian furniture and pottery. By Mr. J. C. Robinson, her Majesty's Surveyor of Pictures, there has been contributed a series of Italian medals, embracing examples of the work of Pisano, Pasti, Guaccialotti, Sperandio, &c. Messrs. Elkington & Co., London, have lent the well-known Helicon Vase, which, although produced by the French artist Ladeuil, is entirely in the style of the Italian Renaissance. Composed of *répoussé* silver and steel, damascened with gold, the vase represents the work of several years, and is valued at 6,000*l.* Perhaps one of the most interesting features of the display is a set of fifty drawings by old masters,—many of them preliminary studies for famous works of art,—from the gallery of Mr. J. Malcolm of Portalloch. Sir Noel Paton, Sir W. Fettes Douglas, and a large number of other collectors have also sent contributions.

The Proposed Riverside Fish Market at Snadwell.—At the last meeting of the Limehouse District Board of Works, Mr. Potto asked Mr. Dunch, the surveyor, what was the present position of the Shadwell Fish Market Scheme, as he thought it would be well that the public should know how the matter stood, and whether the difficulty that had arisen in regard to the financial part of the scheme would be such as to prevent the formation of the market. Mr. Dunch said the Board would remember well the difficulties that had to be surmounted in obtaining the Act authorising the establishment of the market, and knowing what influence was brought to bear, it was not likely that the parties who opposed the measure would desist from their efforts to discredit it, and thus prevent the market being carried out, or cause the absorption of it by the City authorities. This opposition, combined with the circumstance that mistakes had been made in drawing up the prospectus of the company, had prevented the subscription of the whole of the capital. But the project to establish the market had not collapsed. It was not intended that it should collapse, and other steps would be taken to give effect to the London Riverside Fish Market Act, 1882.

Institution of Civil Engineers. — The sixty-fifth annual general meeting of this institution was held in Great George-street on the 19th inst., Sir William Armstrong, C.B., F.R.S., the out-going president, being in the chair. The report of the Council on the proceedings of the Institution during the past year congratulated the members on the steady progress of the Society, which showed no signs of diminution. Since the close of the last official year 238 candidates had been elected, ninety names had from various causes disappeared from the register, leaving a net gain of 148, which had increased the aggregate of all classes to 3,385, irrespective of the students, who numbered 707. The publications had been continued on the same liberal scale, four thick octavo volumes having been issued during the year. Some interesting particulars were given of the growth of the publications, special reference being made to the development of the "correspondence" appended to the report of the oral discussions. The proceedings recorded the work of twenty-five ordinary meetings. There had also been twelve supplemental meetings exclusively devoted to the reading and discussion of papers by students. But it was to be regretted that there was some falling-off in the quality of these communications, of which two only had been deemed worthy of a place in the printed proceedings, as against six last year. One, however, had been of sufficient merit to obtain for its author the Miller Scholarship. During the recess the premises had been entirely redecorated, ten years having elapsed since similar extensive repairs had been undertaken. The library continued to augment in an increasing ratio, and contained upwards of 18,000 volumes. Lastly, the Council referred with satisfaction to the financial condition of the Institution. The income for 1882 had amounted to 12,898*l.* 10s. 11d., while the capital and trust-fund receipts were 3,527*l.* 9s. 6d. and 431*l.* 15s. 6d. respectively. The expenditure had reached 12,788*l.* 5s. 7d., and 3,380*l.* 13s. 6d. had been invested in London and North-Western Railway Debenture Stock. After the reading of the report, the medals and premiums awarded for 1882 were presented, and votes of thanks were passed to the president, council, and officers. The scrutineers announced that the following gentlemen had been elected to serve on the Council for the ensuing year, viz.:—President, Mr. J. Brunlees; Vice-Presidents, Sir J. W. Bazalgette, C.B., Sir F. Bramwell, Mr. G. B. Bruce, and Mr. E. Woods; members, Mr. B. Baker, Mr. J. W. Barry, Mr. G. Berkley, Sir J. Coode, Mr. E. A. Cowper, Sir J. N. Douglass, Mr. A. Giles, Mr. H. Hayter, Dr. W. Pole, Mr. R. Rawlinson, C.B., Mr. A. M. Rendel, Dr. C. W. Siemens, Mr. D. Stevenson, Sir W. Thomson, and Sir J. Whitworth.

The Progress of the Free Libraries Movement.—At a meeting of the members of the Metropolitan Free Libraries Association, held on the 22nd inst., Mr. Edward J. Watherston in the chair, the chairman said that, although the association could not record any success in the metropolitan area, yet, within measurable distance of that area, notably in Richmond, Kingston, Twickenham, and Reading, the movement had taken root, and not only had all opposition to it ceased, but old opponents were now found among its warmest supporters. As Londoners they could but deplore the fact that at present the ratepayers declined to avail themselves of a beneficent Act of Parliament, which permitted them to co-operate, by means of a single penny in the pound upon their assessments, for their mutual benefit. The worst feature of this failure to adopt the Act was to be found in the fact that, thereby, the youth of both sexes in London were handicapped in competition with their provincial rivals, who, being better educated as a result of the advantage of their local free libraries, were naturally selected by London bankers, merchants, manufacturers, and others for the more responsible, and, therefore, most lucrative appointments in their respective businesses.

Ryburghe Church, Fakenham. — The lighting up of this church has been carried out by the use of handsome coronæ and pendants, which are fitted with the patent three-wick Hesperus lamp of Messrs. Jones & Willis, of Birmingham and London.

Mr. Guthrie Lornie, of Birnam, has offered a free site in one of the best parts of the village of Birnam for a public hall and institute, together with a subscription of 100*l.* towards the cost.

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TENDERS

For building schools for 642 children, and masters' residences, at Grays, for the Grays Thurrock School Board. Mr. E. C. Allam, architect:—

G. Seager	£7,953	0	0
T. Boyce	6,970	0	0
North Bros.	6,890	0	0
Higgs & Hill	6,274	0	0
Staines & Son	6,166	0	0
J. Hill	5,900	0	0
W. T. Niblett	5,700	0	0
J. M. Deering	5,605	0	0
H. J. Carter	5,560	0	0
J. Pavitt	5,530	0	0
J. Brown	5,500	0	0
T. Brightmore	5,473	0	0
Pickersgill Bros.	5,360	0	0
J. Webb	5,299	0	0
S. J. Scott	5,297	0	0
W. Shurmur	5,220	0	0
C. Barnes	5,146	0	0
W. H. Archer	4,885	0	0
J. G. Hasluck	4,872	0	0
W. Wood (accepted)	4,643	0	0

For the construction of a concrete storm-water conduit at Abbey Mills, for the West Ham Local Board. Mr. Lewis Angell, engineer. Quantities by R. L. Curtis & Sons:—

Vernon & Ewens	£6,600	0	0
Marshall	6,000	0	0
Mowlem & Co.	5,429	0	0
Botterill	4,990	0	0
Gentry	4,745	0	0
Munday & Son	4,710	0	0
Bentley	4,640	0	0
Bell	4,470	0	0
Jesse Jackson	4,444	0	0
W. G. Harris	4,383	0	0
Dooley	4,184	0	0
John Jackson	4,175	0	0
Kellett & Bentley	4,100	0	0
J. W. & J. Neave (accepted)	3,854	0	0
Dickson	3,566	13	9

For building imbecile wards at the Union House, Milton, for the Portsea Island Board of Guardians. Messrs. Bevis & Hill, architects, Southsea. Quantities by Mr. G. Rake:—

F. White, Landport	£19,400	0	0
W. Ward, Fratton	18,882	0	0
T. W. Quick, Southsea	18,870	0	0
Longley, Crawley, Sussex	18,794	0	0
T. C. Cooper, Landport	18,400	0	0
H. & W. Evans, Southsea	18,400	0	0
G. Burbridge, Southsea	18,095	0	0
J. Crook, Southampton	17,947	0	0
D. W. Lewis, Southsea (accepted)	16,900	0	0

For new Wesleyan Chapel at Gainsborough. Messrs. Parry & Walker, architects, Doncaster. Quantities not supplied:—

Davies & Hewett	£2,821	12	8
Kelsey	2,770	0	0
Riggall & Hewins	2,495	0	0
Bulling	2,480	0	0
Holmes	2,470	0	0
Chadwick & Co.	2,395	0	0
Crosby & Son	2,250	0	0
Arnold & Son (accepted)	2,136	0	0

For alterations, repairs, and forming gateway through the house, No. 84, Paradise-street, Rotherhithe, and the erection of stabling, &c., at rear, for Mr. F. D. Collen. Mr. E. Crosse, architect, 32, Bermondsey-square:—

Bullers	£595	0	0
Winsor	544	0	0
Wells	524	0	0
Chafen	500	0	0
Almond (accepted)	499	0	0

For the construction of sea and retaining walls, esplanade, roads, and other works, at Weston-super-Mare, Somerset. Mr. T. J. Scoones, Bristol, engineer, Quantities by Mr. Barratt, Bristol:—

T. Small & Son	£35,224	0	0!
Lean & Sons	26,500	0	0
A. G. Beaven	25,150	0	0
J. Dickson	24,000	0	0
Hill & Co.	23,500	0	0
W. Cooke & Co.	22,450	0	0
J. Hartley	21,750	0	0
Lovatt & Mousley	21,400	0	0
D. Baker	21,190	0	0
Jesty & Sons	19,979	0	0
G. Moss	19,648	0	0
J. T. Whittam	18,640	0	0
A. Krauss	17,944	0	0!

For new roads and sewers, &c., at Forest Gate, Essex, for the Land Investment Company (Limited). Messrs. Whitmore & Reeves, surveyors, Chelmsford and London. Quantities supplied:—

T. G. Dunmore, Hornsey	£2,142	0	0
T. Adams, Hackney	1,990	0	0
J. E. Bloomfield, Tottenham	1,980	0	0
C. Wyman, Edmonton	1,950	0	0
J. Hoare & Son, London	1,924	0	0
J. Cardus, Acton	1,875	0	0
J. G. B. Marshall, Stratford	1,828	0	0
R. Nicholson, Southend	1,811	19	1
P. G. Pound, Bow-road	1,809	0	0
J. Bell, Wood Green	1,799	0	0
W. Wood, Chelmsford	1,785	0	0
T. Brightmore, Woolwich	1,734	0	0
A. Oliver, Brighton	1,720	0	0
W. Carter, Anerley (too late)	1,660	0	0
John Jackson, West Ham	1,600	0	0
W. Nicholls, Wood Green	1,539	0	0
J. Pizzey, Hornsey	1,525	0	0
W. G. Harris, Stratford	1,507	0	0
J. C. Trueman, South Hackney	1,499	0	0
T. Spurgeon, Forest Gate	1,498	0	0
G. Impey, Leytonstone	1,486	0	0
Jesse Jackson, Leyton	1,444	0	0
H. Wilson, Lavender Hill	1,395	0	0
J. Bentley, Chislehurst (too late)	1,395	0	0
J. Perry, Merton (too late)	1,288	0	0

For the erection of new offices in connexion with the Chelsea Workhouse extension, King's-road, Chelsea, for the Guardians. Messrs. A. & C. Harston, architects, 15, Leadenhall-street. Quantities supplied:—

Le Gassick & Co.	£7,509	0	0
Beach	5,682	0	0
Nightingale	5,643	0	0
Thorn	5,465	15	0
Crockett	5,353	0	0
Higgs	5,206	0	0
Howell & Son	5,122	0	0
Longley	4,931	15	0
W. Johnson, Wandsworth Common*	4,659	14	6

* Accepted.

For detached villa-residence at Friern Park, North Finchley, for Mr. A. Conder. Mr. W. S. Whicher, architect:—

Gregory & Bence (accepted)	£1,400	0	0

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